

# Mongolia II - Bulk Water Supply Expansion Environmental and Social Impact Assessment Report

Millennium Challenge Account – Mongolia

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## Acronyms and Abbreviations

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Al	aluminum
Aol	area of influence
As	arsenic
AWPP	Advanced Water Purification Plant
Ba	barium
Bi	bismuth
BWSE	Bulk Water Supply Expansion Project
Ca	calcium
Cd	cadmium
CESMP	Contractor's Environmental and Social Management Plan
CF	contamination factor
CIA	cumulative impact assessment
CLO	Community Liaison Officer
Co	cobalt
CO <sub>2</sub>	Carbon Dioxide
CP	Construction Package
Cr	chromium
Cu	copper
CWWTP	Central Wastewater Treatment Plant
°C	degrees Celsius
DEIA	detailed environmental impact assessment
EBW	exploratory borehole well
EF	enrichment factor
EIA	environmental impact assessment
ESIA	environmental and social impact assessment
Fe	iron
FHH	female-headed household(s)
FSR	Mongolia II – Bulk Water Supply Final Feasibility Study Report, Western Wellfields
Gg	Gigagram
GoM	Government of Mongolia
GRM	Grievance Redress Mechanism
IFC	International Finance Corporation
I <sub>geo</sub>	geo-accumulation index
ILO	International Labor Organization
IUCN	International Union for Conservation of Nature and Natural Resources
IPPU	Industrial Processes and Product Use

LARP	land acquisition and resettlement plan
LGBTQ+	lesbian, gay, bisexual, transgender, queer (or sometimes questioning), and others
LULUCF	Land use, Land Use Change and Forestry
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MCUD	Ministry of Construction and Urban Design
MEGD	Ministry of Environment and Green Development (now Ministry of Environment and Tourism)
meq/l	milliequivalents per liter
MET	Ministry of Environment and Tourism
Mg	magnesium
mg/l	milligrams per liter
mgO/l	micrograms oxygen per liter
MHH	male headed household(s)
ml	milliliter
Mn	manganese
MNS	Mongolian National Standard(s)
MNT	Mongolian tugrug (currency)
MoE	Ministry of Energy
MSL	Minimum Subsistence Level
µg/l	micrograms per liter
µS/cm	microSiemens per centimeter
ND	not detected in sample
NDC	Intended National Determined Contribution
NGO	non-governmental organization
NH <sub>4</sub>	ammonium
Ni	nickel
NO <sub>2</sub>	nitrite
NO <sub>3</sub>	nitrate
NSO	National Statistics Office
NTU	nephelometric turbidity unit(s)
Pb	lead
PEL	possible effect level
pH	potential of hydrogen
PLI	pollution load index
PS	Performance Standard
RAP	resettlement action plan
Sb	antimony



Se	selenium
SEM	Stakeholder Engagement Matrix
SEP	Stakeholder Engagement Plan
SO <sub>4</sub>	sulfate
SOP	Standard Operating Procedure
SST	Social Safeguards Team
TEL	threshold effect level
Th	thorium
TN	total nitrogen
TOC	total organic carbon
TP	total phosphorus
TPW	test pumping well
U	uranium
UB	Ulaanbaatar
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	United States Environmental Protection Agency
USUG	Ulaanbaatar Water and Sewer Authority
VEC	valued environmental and social components
VOC	volatile organic carbon
WHO	World Health Organization
WRC	Water Resource Council
WWF	World Wide Fund for Nature (formerly World Wildlife Fund)
Zn	zinc

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## Executive Summary

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The availability of safe drinking water is fundamental to reducing poverty, expanding economic opportunity, and promoting public health and welfare in Mongolia. To achieve these goals, the Government of Mongolia (GoM) and the United States Government Millennium Challenge Corporation (MCC) have signed Compact II for cooperation and have established the Millennium Challenge Account-Mongolia (MCA) as a legal entity in Mongolia. MCA-Mongolia seeks to expand the availability of drinking water in Ulaanbaatar (UB), the capital of and largest city in the country, with a 2018 population of about 1.49 million (National Statistical Committee, 2018), comprising nearly half (46 percent) of the nation's total population.

Over the past several years, water demand on UB's water supply sources has increased due to unplanned rapid growth of the city's settlements and the central city, and intense industrial development within the city. Due to anticipated continued population growth and economic expansion, projections of water demand compared to currently available bulk water supply indicate a future shortage of water in UB. Based on projected future water supply demands and existing water supply capabilities—including current production by the Ulaanbaatar Water and Sewer Authority (USUG) and the Ministry of Energy (MoE), but not including production from private wells—by 2045, projected water demands could experience a more than two-fold increase over current demands.

The *MCC Mongolia II – Bulk Water Supply Final Feasibility Study Report, Western Wellfields* (FSR), prepared by AECOM (2018a), was endorsed by the Water Resource Council (WRC) in November 2018. As the FSR recommends, the proposed Bulk Water Supply Expansion (BWSE) would develop two wellfields in the vicinity of Biokombinat and Shuvuun, downstream of the Central Wastewater Treatment Plant (CWWTP) effluent discharge to the Tuul River, to ultimately supply 50 million cubic meters per year of raw untreated water. The project also includes a proposed advanced water purification plant (AWPP) designed to produce up to approximately 137,017 cubic meters per day of purified drinking water, and conveyance facilities to deliver water from the two wellfields to the AWPP and from the AWPP to the USUG water distribution network.

Based on recommendations from the FSR, MCC and the GoM made the strategic decision to support full implementation of the BWSE.

This design phase builds on the work of the feasibility study and includes:

- Detailed environmental, social, and resettlement procedures, including preparation of this environmental and social impact assessment (ESIA) and a resettlement action plan (RAP) to meet MCC requirements, and a detailed environmental impact assessment (DEIA) to meet GoM requirements, as well as other procedures and surveys required under the laws of Mongolia
- Detailed hydrogeological investigations of the Biokombinat and Shuvuun wellfield sites, topo-geodetic survey of the project area, geotechnical soil borings for the AWPP and booster pump stations, and sediment sampling along a 35-kilometer segment of the Tuul River to quantify and characterize sludge or contaminants from the CWWTP
- Design of production wells, the AWPP, well houses, booster pump stations, storage reservoirs, access roads, and conveyance pipelines to deliver groundwater from the production wells to the proposed AWPP for treatment, and from the AWPP to the USUG water distribution network
- Preparation of three construction contract packages (CPs) for competitive tendering

According to MCC policy and ISO/OSHA standards (18001, 45001), the projects funded by MCC are expected to be designed and operated in compliance with international good practices and

applicable regulatory requirements, and to be environmentally sound. The ESIA of the BWSE project has been conducted in accordance with the MCC (2010) Environmental Guidelines, (2011) Gender Policy, and (2016) Counter-Trafficking in Persons Policy, and the International Finance Corporation (IFC) (2012) Policy on Environmental and Social Sustainability and related Performance Standards on Environmental and Social Sustainability.

The elevation of the BWSE area of influence (Aoi) ranges from 1,204 to 1,625 meters above sea level. The highest point is the Songinokhairkhan Mountain summit and the lowest area is the alluvial sediment valley of the Tuul River. The elevation of proposed wellfields in the southwest of UB range from approximately 1,210 meters (Shuvuun wellfield) to 1,250 meters (Biokombinat wellfield) above sea level.

The landscape and ecosystem condition in the Aoi are mainly determined by a combination of local climate, geology, topography, soils, vegetation and the Tuul River hydrological regime. However, landscape and ecosystem conditions have been modified due to the growing human population density, the extent of urbanization, and gravel mining activities, including in the vicinity of the proposed wellfields. In addition, the Tuul River plays an essential role in eco-hydrological processes and people's lifestyles and is important to the cultural heritage of UB. However, the ecosystem services in the Tuul River Valley have been severely degraded by the CWWTP outfall discharge in this vicinity.

As determined by the ESIA, the BWSE project activities would not result in significant residual impacts on soil, air quality, or Tuul River surface water and biodiversity features given the best engineering practices incorporated into the design of the BWSE or otherwise expected to be taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts. However, best engineering practices in place during the BWSE construction, and operation and maintenance phases would not avoid or reduce to below the level at which they would be significant potential impacts on the critical habitat area of the Mongolian marmot (*Marmota sibirica*) nearby the AWPP site. Doing so requires implementing the management measure prescribed in the ESIA to avoid or reduce to acceptable levels the residual impacts on the Mongolian marmot.

Implementation of the BWSE project would have positive direct impacts on the local community. The project would offer opportunities for local entrepreneurs to compete for service provision through a fair and equal opportunity procurement process. Local workers, including women, would apply for jobs based on a non-discriminatory recruitment process. In the long-term, the implementation of the BWSE project would improve UB residents' wellbeing through supply of clean water, contribution to poverty reduction as well as improved public health.

Nevertheless, the construction of the BWSE will not be without adverse impacts. In Khan-Uul district, the project construction directly impacts 65 properties in KhUD, most are only marginally affected by minor land take but a couple are impacted through their livelihood systems with one shop having to temporarily close during installation of pipe outside its entrance. In Songinokhairkhan district, investigations of impacts are still ongoing at time of writing but indicatively 90 properties are affected. As in Khan-Uul, it is expected that the majority of these impacts are caused by marginal land takes or limitations to access during construction. Some summer grazing pasturelands may be affected in Shuvuun Wellfield by the project construction as well as the Songinokhairkhan sacred Mountain. In all cases, mitigation measures to counter and reduce any adverse impacts will be implemented.

Implementation of mitigation measures in the case of the Songinokhairkhan sacred mountain and of any places of religious significance across the project area would contribute to the conservation of the Mongolian cultural memory through preservation and replacement. The project would contribute to social progress with particular attention to the promotion of gender equality through gender affirmative actions. Gender mainstreaming mechanisms throughout the project' life align

with the Government of Mongolia's efforts to promote gender equality and increase women's participation in the economy as well as in the public life (Mongolia Voluntary National Review Report 2019). Throughout the implementation of the project, especially the construction, and operation and maintenance phases, any potential adverse effect on the community would be countered by adherence to best policies, guidelines, and practices while fostering socially accepted behavior.

No significant, adverse cumulative impacts would result from the proposed BWSE together with other existing, planned, or reasonably defined contemporaneous developments in the vicinity of the BWSE.

Moreover, MCC is committed to ensuring consultation with affected parties and public disclosure of associated documents, and most importantly to the wellbeing of affected communities. Public consultation and stakeholder engagement activities are core values of the BWSE project. The main purpose of public consultation and stakeholder engagement activities is to establish and develop two-way communication between the BWSE project implementer and the public and stakeholders, at decision-maker and local community levels, to ensure stakeholders views are incorporated into BWSE project design and the ESIA.

The BWSE contractors and operator will be required to implement the management measures prescribed in the environmental and social management plans (ESMPs) appended to both the ESIA and the construction contract documents. The requirements of the ESMPs govern the implementation, management, and monitoring of the management measures, in concert with the technical specifications and other requirements in the contract documents, that the ESIA team has identified as being necessary to control the environmental and social impacts of the BWSE project.

# 1. Introduction

## 1.1 Project Purpose and Scope

The availability of safe drinking water is fundamental to reducing poverty, expanding economic opportunity, and promoting public health and welfare in Mongolia. To achieve these goals, the Government of Mongolia (GoM) and the United States Government Millennium Challenge Corporation (MCC) have signed Compact II for cooperation and have established the Millennium Challenge Account-Mongolia (MCA) as a legal entity in Mongolia. MCA-Mongolia seeks to expand the availability of drinking water in Ulaanbaatar (UB), the capital of and largest city in the country, with a 2018 population of about 1.49 million (National Statistical Committee, 2018), comprising nearly half (46 percent) of the nation's total population.

Over the past several years, water demand on UB's water supply sources has increased due to unplanned rapid growth of the city's settlements and the central city, and intense industrial development within the city. Due to anticipated continued population growth and economic expansion, projections of water demand compared to currently available bulk water supply indicate a future shortage of water in UB. Figure 1-1 graphs both the projected future water supply demands through 2045 and existing water supply capabilities, including current production by the Ulaanbaatar Water and Sewer Authority (USUG) and the Ministry of Energy (MoE), but not including production from private wells. By 2045, projected water demands could experience a more than two-fold increase over current demands.

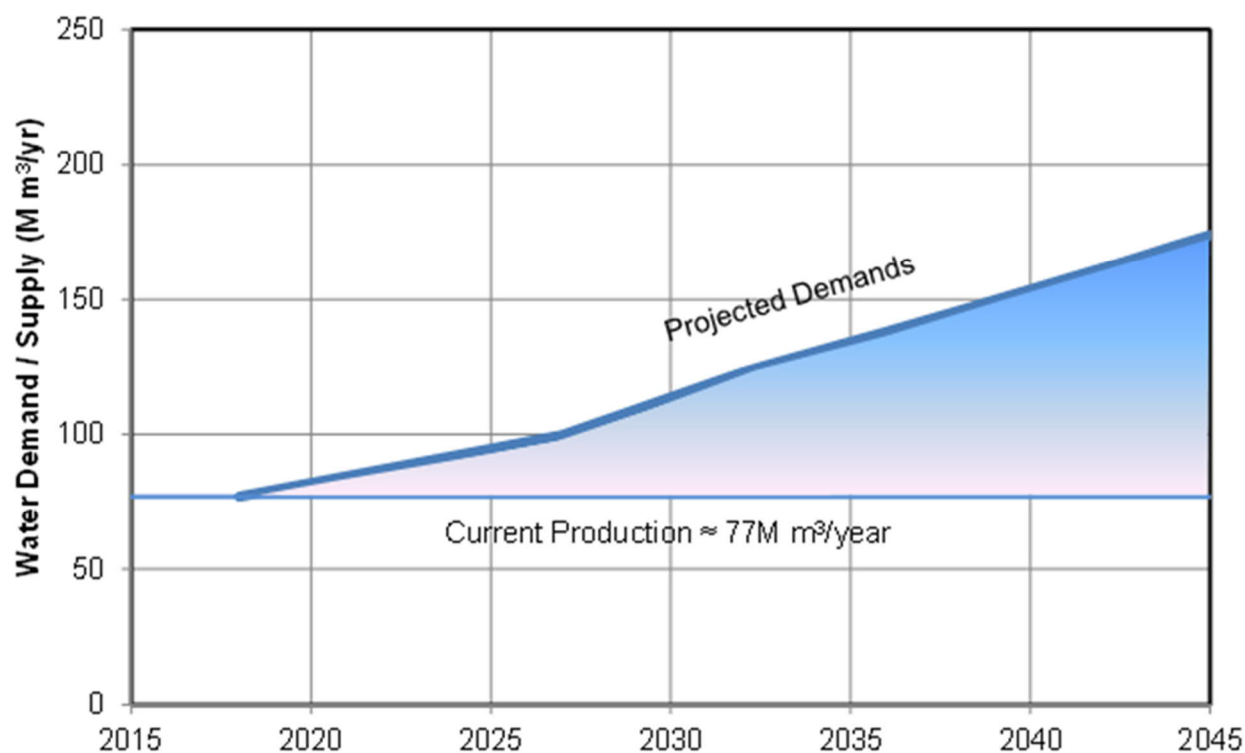


Figure 1-1 Current Production vs. Projected Water Supply Demands (AECOM, 2018a)

The MCC *Mongolia II – Bulk Water Supply Final Feasibility Study Report, Western Wellfields* (FSR), prepared by AECOM (2018a), was endorsed by the Water Resource Council (WRC) in November 2018. As the FSR recommends, the proposed Bulk Water Supply Expansion (BWSE) would develop two wellfields in the vicinity of Biokombinat and Shuvuun, downstream of the Central Wastewater Treatment Plant (CWWTP) effluent discharge to the Tuul River, to ultimately supply 50 million cubic meters per year of raw untreated water. By providing this additional supply,

the BWSE would partially address the anticipated shortfall in water supply capacity by increasing groundwater withdrawals from the regional surficial aquifer. The project also includes a proposed advanced water purification plant (AWPP) designed to treat up to 140,000 cubic meters per day of raw water to drinking water standards, and conveyance facilities to deliver water from the two wellfields to the AWPP and from the AWPP to the USUG water distribution network.

The FSR provides the technical, economic, social, and environmental basis for planning this proposed expansion of the water supply to UB. It also provides the results from hydrogeological field investigations during the FS, surface and groundwater quality sampling, raw water purification tests and process evaluations, and preliminary hydraulic modeling of connections to the USUG water distribution network.

Based on recommendations from the FSR, MCC and the GoM made the strategic decision to support full implementation of the BWSE.

This design phase builds on the work of the feasibility study and includes:

- Detailed environmental, social and gender, health and safety, and resettlement procedures, including preparation of this environmental and social impact assessment (ESIA) and a resettlement action plan (RAP) to meet MCC requirements, and a detailed environmental impact assessment (DEIA) to meet GoM requirements, as well as other procedures and surveys required under the laws of Mongolia
- Detailed hydrogeological investigations of the Biokombinat and Shuvuun wellfield sites, including:
  - geophysical surveys, stratigraphic identification, and borehole geophysics
  - drilling, construction, and development of test pumping wells
  - pumping tests and water quality sampling of test pumping wells
  - drilling and construction of observation wells
- Topo-geodetic survey of the project area
- Geotechnical soil borings for the AWPP and booster pump stations
- Sediment sampling along a 35-kilometer segment of the Tuul River to quantify and characterize sludge or contaminants from the CWWTP
- Design of:
  - production wells
  - AWPP
  - well houses, booster pump stations, storage reservoirs, access roads, and conveyance pipelines to deliver groundwater from the production wells to the proposed AWPP for treatment, and from the AWPP to the USUG water distribution network
- Preparation of three construction contract packages (CPs) for competitive tendering:
  - CP-1 Production Well Drilling, Construction, Development, and Acceptance Testing
  - CP-2 Advanced Water Purification Plant (AWPP)
  - CP-3 Raw and Finished Water Conveyance

In addition, under a separate contract, the GoM would tender CP-4, which would provide high voltage transmission lines and substations to feed power to the CP-2 and CP-3 infrastructure, and hot water supply lines, heat exchangers, and a booster pump station to heat facilities at the AWPP. However, as CP-4 design is not yet contracted as of this writing, with available information being limited to preliminary investigations intended to inform a design scope, the high voltage power supply and heat supply, and their potential impacts are not assessed in this document. Rather, high voltage power supply and heat supply activities will be addressed in supplemental

ESIAs expected to be issued in April 2021. The supplemental ESIAs will update the BWSE ESIA with respect to the high voltage power supply and heat supply activities and their anticipated environmental and social impacts.

## 1.2 Project Area

The landscape and ecosystem conditions of the planned project area are mainly determined by combination of local climate, geology, topography, soils, vegetation and Tuul River hydrological regime. However, landscape and ecosystem conditions have been modified due to growing human population density, urbanization, and gravel mining. Additionally, the Tuul River plays an essential role in eco-hydrological processes and people's lifestyles, and is important to the cultural heritage of UB. However, the ecosystem of the Tuul River has been severely degraded by the outfall discharge of the existing CWWTP in the vicinity of the Biokombinat Wellfield. The elevation of the area ranges from 1,204 to 1,625 meters above sea level. The highest point is the Songinokhairkhan Mountain summit and the lowest area is the alluvial<sup>1</sup> sediment valley of the Tuul River.

The planned project area is located in Khan-Uul and Songinokhairkhan district of UB. As mentioned in Section 1.1, the BWSE project would develop two wellfields in the vicinity of Biokombinat and Shuvuun in Khan-Uul district, downstream of UB. The elevation of the proposed wellfields in the southwest of UB ranges from approximately 1,210 meters (Shuvuun wellfield) to 1,250 meters (Biokombinat wellfield) above sea level. The BWSE project components and their location by administrative areas are summarized in Table 1-1.

**Table 1-1 BWSE Project Components**

BWSE project components	Location (by administrative unit)
1. <b>Shuvuun wellfield</b>	12 <sup>th</sup> khoroo of Khan-Uul District
2. <b>Biokombinat wellfield</b>	10 <sup>th</sup> khoroo of Khan-Uul District
3. <b>AWPP facilities</b>	32 <sup>nd</sup> khoroo of Songinokhairkhan District
4. <b>Raw water pipeline from Shuvuun wellfield to AWPP site</b>	13 <sup>th</sup> , 12 <sup>th</sup> and 10 <sup>th</sup> khoroo of Khan-Uul District
5. <b>Raw water pipeline from Biokombinat wellfield to AWPP site</b>	10 <sup>th</sup> khoroo of Khan-Uul District; 32 <sup>nd</sup> khoroo of Songinokhairkhan District
6. <b>Finished water pipeline form AWPP Site to USUG connection point</b>	32 <sup>nd</sup> and 20 <sup>th</sup> khoroo of Songinokhairkhan District
7. <b>Brine sewer</b>	32 <sup>nd</sup> khoroo of Songinokhairkhan District
8. <b>10 kV power transmission line from AWPP to Biokombinat wellfield</b>	10 <sup>th</sup> khoroo of Khan-Uul District; 32 <sup>nd</sup> khoroo of Songinokhairkhan District
9. <b>10 kV power transmission line in Biokombinat wellfield</b>	10 <sup>th</sup> khoroo of Khan-Uul District
10. <b>10 kV power transmission line in Shuvuun wellfield</b>	13 <sup>th</sup> khoroo of Khan-Uul District
11. <b>Access road to AWPP site</b>	32 <sup>nd</sup> khoroo of Songinokhairkhan District

Whereas for the feasibility study the project area was specifically defined as a 200-meter zone around the new infrastructure, the socio-economic baseline survey for the ESIA covered both the direct area of impact (or buffer zones) and the area of influence (AoI) of each project component social data. Data was collected at the level according to availability and appropriate level of

<sup>1</sup> Alluvial pertains to material or processes associated with transportation and/or subaerial deposition by concentrated running water. (United States Department of Agriculture, 2019, Glossary of Landform and Geologic Terms)

analysis, some at District level, some at Khoroo level, some for affected areas. Many statistics were only available at District level.

Buffer zones relating to wellhead protection zones and the exclusion of specific activities at various distances (e.g., special protected zone – 50 meters; ordinary protected zone – 200 meters for rivers; sanitary restricted zone – 100 meters; and sanitary limited zone – 400 meters for wellfields) were established during the design phase. The number and locations of wells were finalized, and balanced the need to limit uses that contribute pollution (e.g., industry, agriculture) with the need to maintain access to pastureland (and minimize impacts on livestock farming), in consideration of the AWPP's capabilities to adequately protect human health.

Consistent with International Finance Corporation (IFC) Performance Standard 1 (PS1), the overall Aol of the activity encompasses, as appropriate:

- The area likely to be affected by: (i) the project<sup>2</sup> and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project<sup>3</sup>; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

Therefore, the overall Aol of the BWSE project is decided based on IFC PS1 requirements (see Figure 1-2). In this overall Aol is included five khoros in two districts as shown in Table 1-1 in order to carry out a detailed assessment of the social impacts.

As shown in Figure 1-2, the overall BWSE area of influence (Aol) is the Tuul River watershed:

- Encompassing Khan-Uul and Songinokhairkhan Districts in UB, where the project infrastructure would be constructed
- Encompassing the USUG water supply service area, where the population who would benefit from the improved water supply reside
- Extending downstream to the border between UB and Altan-Bulag soum of Tuv aimag

The border between UB and Altan-Bulag soum was designated as the downstream extent of the Aol because this was the farthest downstream sampling transect in the Tuul River Sediment Sampling Program and was observed to be well downstream of river sections where sludge from the CWWTP has accumulated in the river sediments (AECOM, 2019b).

The specific Aol for each of the environmental and socioeconomic resources discussed in this ESIA varies within the overall Aol as shown in Figure 1-2, depending on their nature and relationship to the proposed BWSE. The overall Aol of BWSE project in Figure 1-2 covers 17,898 hectares. For some of the resources, the impacts may be site specific, such as impacts on

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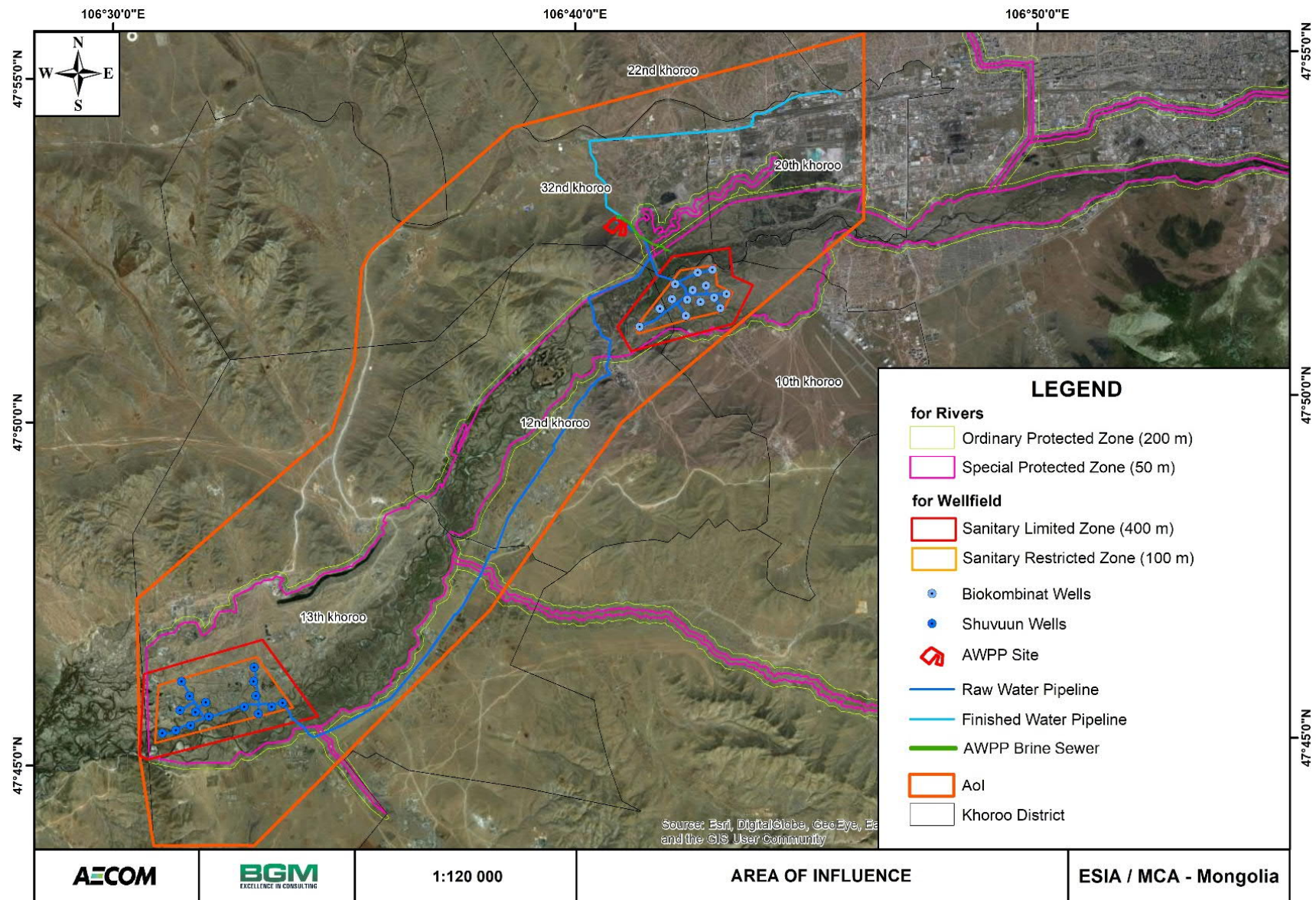
<sup>2</sup> Examples include the project's sites, the immediate airshed and watershed, or transport corridors, (IFS PS1)

<sup>3</sup> Examples include power transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, construction camps, and contaminated land (e.g., soil, groundwater, surface water, and sediments), (IFS PS1).



vegetation. For others, such as air quality, the project may generate impacts on a local and sub-regional scale. Other impacts, notably those related to climate change, are evaluated at the global scale, as the potential effects of greenhouse gas emissions are by nature global.

However, the effects of certain impacts in term of environmental components would be seen over a wider area, the most noticeable impacts would be felt within a limited distance from the sources within overall AoI. The buffer zone for overall AoI has therefore been set as shown in Figure 1-2 as this is the distance beyond which the BWSE project would cause no noticeable disruption to the surrounding environmental components and local communities.



## 1.3 Report Content and Organization

The main purpose of this ESIA is to predict and assess potential adverse social and environmental impacts during BWSE project implementation and to develop suitable mitigation measures, which are documented in an environmental and social management plans (ESMPs). Disbursement of MCC funding for the BWSE project is contingent upon completion of the ESIA. The ESIA has been conducted in accordance with and complies with the MCC (2010) Environmental Guidelines and (2011) Gender Policy, and the International Finance Corporation (IFC) (2012) Policy on Environmental and Social Sustainability and related Performance Standards on Environmental and Social Sustainability (IFC Performance Standards, 2012). The ESIA is consistent with the MCA-Mongolia (2020) Environmental and Social Management System.

This ESIA documents the existing conditions of the natural and human environments in which the BWSE would be implemented, identifies and evaluates project-related environmental, social, and gender impacts, and establishes a process for managing adverse environmental, social, and gender impacts and enhancing beneficial impacts during implementation of the project. The ESIA is organized as follows:

- Section 1 describes the background, purpose, and scope of the proposed expansion of the bulk water supply system serving UB, the overall Aol of the BWSE, as well as the organization of this report.
- Section 2 describes the policy, legal, and administrative framework of the proposed BWSE.
- Section 3 summarizes the ESIA methodology.
- Section 4 describes the program to engage and consult with the public affected by the project and stakeholders.
- Section 5 describes the components of the BWSE, presents a summary of the project phasing and implementation, and provides an overview of best engineering practices incorporated into the design of the BWSE to avoid or minimize adverse environmental, social, and gender impacts.
- Section 6 describes the existing baseline of environmental, social, and gender conditions of the Aol.
- Section 7 assesses the project's potential short-term (construction-related) and long-term (operation-related) impacts to the natural and human environments.
- Section 8 identifies potential impacts of climate change on BWSE infrastructure and operation, and on the quality and quantity of the water supply provided by the project.
- Section 9 assesses the cumulative impact of the BWSE when added to other past, present, and reasonably foreseeable future actions.
- Section 10 evaluates management measures to reinforce beneficial environmental impacts and avoid and mitigate adverse impacts, and identifies any residual adverse impacts that cannot be mitigated.
- Section 11 evaluates management measures to reinforce beneficial social and gender impacts and avoid and mitigate adverse impacts, and identifies any residual adverse impacts that cannot be mitigated.
- Section 12 compares feasible alternatives to the proposed project sites, technologies, design, and operation.
- Section 13 introduces the environmental and social management plans (ESMPs), presented in ESIA appendices, that specify management measures and associated monitoring to be implemented to avoid, minimize, or offset the potentially significant adverse environmental, social, and gender impacts (or, as needed, specify compensation for adverse impacts), and to reinforce the benefits of the BWSE.
- Section 14 lists the references used in preparing this ESIA.

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## **2. Policy, Legal, and Administrative Framework**

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This section provides an overview of the national and international policy, legal, and administrative framework of relevance to the proposed BWSE, covering the national environmental, social, and health and safety legislation, as well as international environmental and social standards including the IFC Performance Standards as well as MCC policies on Gender and Social Inclusion and Trafficking in Persons.

### **2.1 Mongolian Environmental and Social Policy, Legal, and Institutional Framework**

Mongolia has enacted a comprehensive policy and legal framework for environmental assessment and management. The hierarchy of policies and legislative provisions for environmental management and human wellness in Mongolia includes the Constitution, international conventions, policies, and environment and resource protection laws, regulations, and standards.

#### **2.1.1 International Conventions**

Mongolia has signed on to a number of international environmental conventions, including<sup>4</sup>:

- Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention), 1972
- Convention on International Trade in Endangered Species of Fauna and Flora, 1975
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), 1975
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1983
- Vienna Convention for the Protection of the Ozone Layer, 1988
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1989
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1992
- Convention on Biological Diversity, 1993
- United Nations Framework Convention on Climate Change, 1994
- United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1996
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2003
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 2004
- Stockholm Convention on Persistent Organic Pollutants, 2004
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 2005
- Paris Agreement, 2016

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<sup>4</sup> Indicated date is the date of entry into force or adoption, as applicable.



In addition, Mongolia has ratified the following International Labor Organization fundamental conventions, and International Human Rights instruments and conventions:

### **Labor**

- Forced Labor Convention, 1930 (number 29)
- Freedom of Association and Protection of the Right to Organize Convention, 1948 (number 87)
- Right to Organize and Collective Bargaining Convention, 1949 (number 98)
- Equal Remuneration Convention, 1951 (number 100)
- Abolition of Forced Labor Convention, 1957 (number 105)
- Discrimination (Employment and Occupation) Convention, 1958 (number 111)
- Minimum Age Convention, 1973 (number 138)
- Worst Forms of Child Labor Convention, 1999 (number 182)
- Human Rights
- Universal Declaration of Human Rights, 1949
- Convention on the Political Rights of Women, 1965
- Convention on the Elimination of All Forms of Discrimination against Women, 1981
- Convention on the Rights of the Child, 1990
- New York convention against human trafficking, 1992
- Convention on the Rights of Persons with Disabilities, 2009

## **2.1.2 Policy Framework**

The Government of Mongolia has developed and enacted national-level policies with its action plan to harmonize regulations for environmental policy in terms of sustainable development and green economy concepts (Byambakhuu et al., 2013). In accordance with these aims and interests, Mongolia's National Council for Sustainable Development was established in 1996 to manage and organize activities related to sustainable development in the country (Dagvadorj, 2002).

Furthermore, the Mongolian Parliament endorsed the Mongolian National Security Concept in 2010 that states "Environmental balance, water resources conservation, mitigation of impacts of climate change and land degradation, prevention from biodiversity depletion and reduction of environmental pollution, natural disasters and calamities shall be the basis for people's healthy living and environmental security".

Thus, within the framework of environmental policy updated, the strategic goal targets environmentally friendly, economically stable, and socially wealthy development, which emphasizes people as the determining factor for long-term sustainable development.

The construction sector-specific gender-responsive policy by the Ministry of Construction and Urban Design (MCUD) (The Construction and Urban Development Sector Gender-Responsive Policy /2018-2025/) provides support towards the development of a gender-responsive planning, implementation, monitoring and evaluation processes in the construction and urban development sector. The policy seeks to promote gender balance in the construction projects both among workers as well as decision makers.

Furthermore, the Ministry of Labor and Social Welfare (2016) has expanded policies to guide entrepreneurs in the evaluation and monitoring of hazardous work prohibited for children. With specific emphasis on gender and women, the National Committee on Gender Equality (NCGE), headed by the Prime Minister of Mongolia, is responsible for 'ensuring equal participation of the

public and the Government in, and sustainability of, the implementation of gender equality policies”.<sup>5</sup>

Mongolia has also developed a number of key policy documents, including:

- Biodiversity Conservation Action Plan, 1996
- State Policy for Ecology, 1997
- National Action Plan for Protected Areas, 1998
- Mongolian Action Program for the 21st Century (Map21), 1998
- National Action Plan to Combat Desertification, 2000
- National Environmental Action Plan, 1996, 2000
- National Action Plan for Water, 2010
- National Action Plan on Climate Change, 2011
- Green Development Policy of Mongolia, 2014
- State Policy for Forest, 2015
- Mongolian’s Sustainable Development Vision 2030, 2016
- The Construction and Urban Development Sector Gender-Responsive Policy (2018-2025)

In addition, guidance documents with important environmental consequences and repercussions were developed under the auspices of various ministries. These include the Roads Master Plan, the Power Sector Master Plan, the Tourism Master Plan, and the Renewable Energy Master Plan. Other documents, such as the annual Human Development Reports, have increasingly incorporated environmental aspects.

MCC Trafficking-in-Persons (TIP) offers a framework and guidance in the assessment of risks related to trafficking in persons. Other guidelines come from protocols such as the UN Human Rights Commission’s Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children supplementing the United Nations Convention against Transnational Organized Crime (2000).

## 2.1.3 Legal Framework

Environmental policy reform undertaken since the early 1990s has resulted in a large number of environmental laws, the ratification of most international environmental conventions, and protection of a substantial area of the country in the protected area system, and an increased presence of non-governmental organizations (NGOs). In consideration thereof, a gap analysis was performed of existing environmental laws that resulted in filling gaps and eliminating duplications, actions that were adopted by the Mongolian Parliament in May 2012, marking a milestone in environmental legal reform. Key features of this environmental legal reform were the integration of concepts of (Khuldorj, 2012):

- Environmental auditing
- Polluter pays principle
- Involvement of local communities in environmental protection
- Increasing economic values of natural resources and capitals
- Creation of sustainable sources for environmental protection measures

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<sup>5</sup> <https://gender.gov.mn/introduction>.

- Promotion of sustainable natural resource management

Additionally, laws are in place to guide land use and expropriation of land, protect cultural heritage, maintain the health and safety of the labor force, direct the provision of urban services, and promote gender equality and the rights of people with disabilities.

The Constitution of Mongolia (1992), a guarantees equal rights for men and women in the social, political, cultural, economic life and family relations. The law on Promotion of Gender Equality was passed in 2011 to emphasize the obligations of public organizations to protect citizens against gender-based discrimination.

Employment and social welfare laws were adopted in 1998 and revised several times between 2005 and 2019. The legal frameworks include a number of laws such as Law on Government, Law of government structure, Law on ministries legislation, Law on employment promotion and Package laws of social insurance and social welfare. Laws are in place to ensure social protection of older and youth, labor force, promote gender equality and rights of people with disabilities and social insurance and welfare.

A list of relevant environmental and social legislation is presented in Table 2-1, and the following subsections summarize the legislation that is most pertinent to the BWSE and this ESIA.

**Table 2-1 Applicable Mongolian Environmental and Social Laws**

<b>Current Laws</b>	<b>Latest Changes</b>
<b>Law on Subsoil</b>	Amended, 12015
<b>Law on Protection of Cultural Heritage</b>	Amended 2020
<b>Law on Hazardous Substances and Chemicals</b>	Enacted, 2020
<b>Law on Waste</b>	Amended, 2020
<b>Law on Special Protected areas</b>	Amended, 2019
<b>Law on Buffer Zones</b>	Amended, 2015
<b>Law on Culture</b>	Amended, 2018
<b>Law on Land Fees</b>	Amended 2019
<b>Law on Prohibition of Mineral Exploration and Mining Operations at Headwaters of Rivers, Protected Zones of Water Reservoirs and Forested Areas</b>	Amended, 2015
<b>Law on Natural Plants</b>	Amended, 2015
<b>Law on Cadaster Mapping and Land Cadaster</b>	Amended 2018
<b>Law on Protection of Plants</b>	Amended, 2015
<b>Law on Sanitation</b>	Amended, 2018
<b>Law on Labor Safety and Hygiene</b>	Amended, 2018
<b>Law on Allocation of Land to Mongolian Citizens for Ownership</b>	Amended, 2019
<b>Law on Promotion of Gender Equality</b>	Enacted, 2017
<b>Law on Environmental Protection</b>	Amended, 2019
<b>Law on Environmental Impact Assessment</b>	Amended, 2017
<b>Law on Air</b>	Enacted, 2019
<b>Law on Fees for Air Pollution</b>	Amended, 2019
<b>Law on Water</b>	Enacted, 2020
<b>Law on Water Pollution Fees</b>	Enacted, 2019
<b>Law on Fees for the Use of Natural Resources</b>	Enacted, 2017
<b>Law on Forests</b>	Amended, 2019
<b>Law on Land</b>	Amended, 2019
<b>Law on Soil Protection and Combating Desertification</b>	Created, 2015

Current Laws	Latest Changes
Law on Fauna	Amended, 2017
Law on Minerals	Amended 2019
Law on Fire Safety	Amended, 2015
Law on Disaster Protection	Amended, 2020
Law on Construction	Amended, 2020
Law on Controlling Circulation of Explosives and Blasting Tools	Enacted, 2013
Law on Common Distributed Mineral Resource	Enacted, 2017
Law on Development Policy Planning	Amended, 2019
Law on Urban Development	Amended, 2015
Law on Redevelopment of City and Settlement Areas	Enacted, 2015
Law on the Rights of People with Disabilities	Amended, 2016
Law on Child rights	Enacted, 2016
Law on Urban Settlement Areas Water Supply and Sewerage	Amended, 2019
Law on Employment Promotion	Amended, 2017
Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad	Amended, 2017
Law on Elders	Enacted, 2017
Law on Family	Amended, 2018
Law on Social Welfare	Amended, 2018
Civil Code of Mongolia	Amended 2019
Law on Combating Human Trafficking	Amended, 2020
Law to Combat Domestic Violence	Amended, 2019
Law on Labor	Amended, 2019
Law on Information Transparency and access to information	<b>Amended, 2020</b>
Law on Child protection	Amended, 2019
Law on Health	Amended, 2020
Law on Education	Amended, 2019
Law on Human rights national commission	Amended, 2020
Criminal Code	Amended, 2020
Law on Infringement	Amended, 2020
Law on Meteorology and Environmental Monitoring	Amended, 2020
Law on Labor Safety and Hygiene	Date

### 2.1.3.1 Law on Environmental Protection

The *Law on Environmental Protection* (2012) is an overarching law for all environmental legislation. It is the principal law that regulates activities associated with the protection of the environment, with special emphasis on 'Natural Resource Reserve Assessment' and 'Environmental Impact Assessment.' It governs the land and subsoil, mineral resources, water resources, plants, wildlife, and air, and requires their protection against adverse effects to prevent ecological imbalance.

The environmental protection law regulates the interrelations between the state, citizens, economic entities, and organizations, with a guarantee for the human right to live in a healthy and safe environment. It aims for ecologically balanced social and economic development, the protection of the environment for present and future generations, and the proper use of natural resources, including land restoration and protecting land and soil from adverse ecological effects.



Article 7 of the law requires project proponents to conduct a natural resource assessment and environmental impact assessment (EIA) to preserve the natural state of the environment, and Article 10 requires project proponents to conduct environmental monitoring on the state and changes of the environment.

The latest amendment to the *Law on Environmental Protection* (2012) establishes the liability of polluters to pay compensation for damage caused to the environment and natural resources. The amount of compensation payable depends on the natural resources that have suffered the damage.

### 2.1.3.2 Law on Environmental Impact Assessment

The Law on Environmental Impact Assessment (1998, amended 2002 and 2012) regulates Mongolian EIA requirements. The terms of the law apply to all new projects, as well as rehabilitation and expansion of existing industrial, service, or construction activities and projects that use natural resources. Depending on the type and size of the planned activity, the responsible party for implementing the EIA law will be the Ministry of Environment and Tourism (MET), formerly the Ministry of Environment and Green Development (MEGD), the aimag (provincial) governor's office, or the capital city governor's office. For the BWSE, the responsible party is MET as discussed in Table 2-2.

Table 2-2 Project Categories

Project Categories	Responsible Party	
	MET	Aimag (provincial) governor's office
1. Mining projects	All types of mining projects	Small mining projects with non-commercial purposes
2. Heavy Industry projects	All projects Concentrator Processing Chemical plant Coking chemical facility Other all kinds	
3. Light and Food Industry projects	Large commercial projects	Projects proposed by local small and medium enterprises
4. Agriculture Projects	Construction of dam Irrigation system Development of virgin land	Local afforestation projects Greening and gardening Small scale farming
5. Infrastructure projects	Power-generating stations with capacity greater than 1 MW; power transmission lines of 35 KV or more; construction of heated pipelines; hydropower stations, airports, international communication line road network and railroad, oil depot	Power generating units with up to 1 MW, power transmission line with capacity up to 35 KV, local scale heating pipelines, roads and communication lines.
6. Service sector projects	Major hotels and resorts with capacity greater than 50 beds	Hotels and guest houses with capacity less than 50 beds. Tourism
7. Other projects	<b>Projects in settlements of more than 10,000.</b> Construction of defense facilities with national significance.	Projects in settlements of less than 10,000  Construction of defense facilities with national significance
<ul style="list-style-type: none"> <li>• Urban Development</li> <li>• Defense, emergency</li> <li>• Water supply</li> <li>• Wastewater treatment plants</li> <li>• Landfill</li> </ul>		

Project Categories	Responsible Party	
	MET	Aimag (provincial) governor's office
<b>8. Projects related to biodiversity</b>	Big fishery projects Any projects related to the relocation and use of wildlife and vegetation	Hunting and afforestation Other projects with lower capacity for local use only
<b>9. Projects involving with production of Genetic modified organisms</b>	Breeding Production Planting Importation Transboundary trade	Planting GMO in local area Small and medium scale enterprises using GMOs Reforestation and afforestation
<b>10. Projects dealt with any toxic chemicals, radiological substances and toxic wastes</b>	All projects on processing, use, storing, transportation and disposal of toxic chemicals, radiological substances and toxic wastes	
<b>11. Activity in the Special Protected Areas</b>	All projects within the territory of the Special Protected Areas.	Local projects
<b>Source: Appendix to the Law on Environmental Impact Assessment dated on May, 17 of 2012</b>		

There are two types of EIAs defined in Article 7 of the EIA law: an initial screening through a general environmental impact assessment (GEIA) and a detailed environmental impact assessment (DEIA). The project implementer prepares and submits to the responsible party (i.e. MET) an environmental baseline assessment (EBA) report, description of the proposed project, approved feasibility study, engineering drawings, and written opinion of the soum (second level administrative district) governor. The "assessment specialist" of the responsible party reviews those documents, carries out the GEIA of the proposed project with subject-matter specialists of the respective state agencies, and provides to the project implementer a GEIA document that culminates with one of the following four conclusions:

- Project may be implemented without conducting a DEIA
- Project may be implemented without conducting a DEIA, but with specific conditions and/or impact mitigation measures
- Project requires a DEIA
- Project rejected on grounds of non-conformity with relevant legislation, or the adverse impact of the equipment and technology on the environment are too great, or if it is absent in land management planning

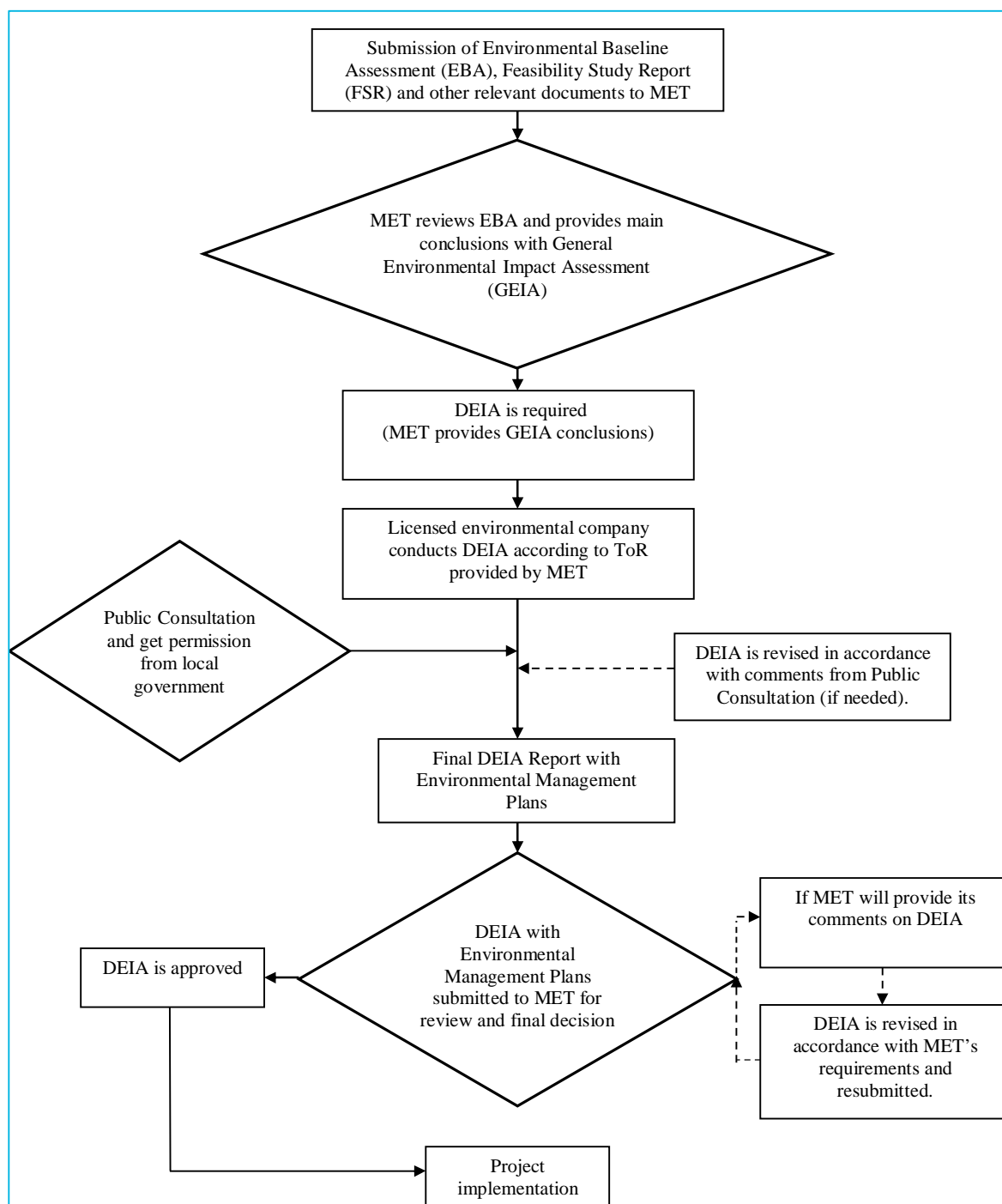
The review process by the assessment specialist of the responsible party culminating in issuing a GEIA with conclusions generally is completed within 14 working days. If a DEIA is required, the GEIA conclusions define the DEIA scope of work. For the BWSE Project, a GEIA was prepared and issued by the MET in November, 2019 and it recommended that a DEIA be prepared for the BWSE Project, according to Mongolian EIA law. The DEIA for the BWSE Project is being prepared in parallel to, and being informed by, the findings of this ESIA.

The DEIA report must be prepared by a MET authorized Mongolian company, and should be submitted to the responsible party for DEIA approval by the project proponent. As specified in DEIA guideline (MET Order No. A-117), the DEIA report should include the following:

- Non-technical summary
- Foreword
- Scope of the DEIA
- Project description

- Assessment of potential adverse impacts of the project
- Determination of measures to prevent, minimize, eliminate, and offset negative impacts
- Risk assessment and management
- Main results and consolidation summary
- Environmental management plans
- References

The assessment specialist who carries out the GEIA also reviews the DEIA, typically within 18 working days of receipt, and presents the findings to the responsible party. Based on the content of the DEIA, the assessment specialist conclusions, and any additional comments by MET departments, the responsible party issues a decision on whether to approve or reject the DEIA report. Figure 2-1 depicts the EIA process in Mongolia, with MET being the responsible party, for a project that ultimately is approved and implemented.



**Figure 2-1 Flowchart of EIA Process in Mongolia**

### 2.1.3.3 Law on Water

The *Law on Water* (2012) regulates relations pertaining to the effective use, protection, and restoration of water resources. It specifies regular monitoring of the levels of water resources, quality, and pollution, and provides safeguards against water pollution.

### 2.1.3.4 Law on Wastes

The *Law on Wastes* (2017) governs the collection, transportation, storage, and depositing in landfills of household and industrial waste, and reusing waste as a source of raw materials to

eliminate hazardous impacts of household and industrial waste on public health and the environment. Undertakings that generate significant amounts of wastes must dispose of the wastes in designated landfills that meet prescribed standards.

### **2.1.3.5 Law on Special Protected Areas**

The *Law on Special Protected Areas* (2014) regulates the use and procurement of land for state protection, fosters scientific research, and preserves and conserves the land's original condition in order to protect specific characteristics, unique formations, rare and endangered plants and animals, historic and cultural monuments, and natural beauty. The law establishes four protected area categories, each managing land for a different purpose under a separate management directive. These comprise strictly protected areas, national parks, nature reserves, and natural monuments.

### **2.1.3.6 Law on Promotion of Gender Equality**

This law specifically ensures gender equality in political, legal, economic, social, cultural, and family relations, and regulates relations with respect to gender equality. It sets out specific responsibilities of various public agencies in implementation of the law. Additionally, its strategy is to protect against gender discrimination in all sectors by strengthening the capacity of the National Committee on Gender Equality, introducing gender equality at all levels of policymaking, and developing sub-sectoral gender-sensitive policies.

Article XI, paragraph 4 of the law requires that, In order to prevent and keep the workplace free of sexual harassment and to maintain zero tolerance of such harassment, an employer shall incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.

### **2.1.3.7 Law on Infringement**

The purpose of this law is to strengthen the justice system by imposing fines on the individuals or legal entities who have breached and violated against this law and administrative liabilities.

### **2.1.3.8 Law on Combating Human Trafficking**

The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights. It further defines roles and responsibilities, and grants power to relevant administrative organizations in charge of social welfare, labor, health, and education, and to professional inspection organizations to design and implement programs aimed at preventing and combating human trafficking and assisting and protecting victims. The law reinforces provisions of the Constitution of Mongolia, the Law on Crime and Prevention of Violations, and other legislative acts.

### **2.1.3.9 Law to Combat Domestic Violence**

The law regulates all matters pertaining to protecting against human rights violations, ensuring victims' safety, holding perpetrators accountable, and regulating the participation of government and NGOs, citizens, economic entities, and authorities in combating and preventing domestic violence. The enactment of the law was a significant step forward in strengthening women's rights and efforts to reduce violence against women. The law is harmonized with the Criminal Code, Law on Law Enforcement, Law on Administrative Violations, Law on Criminal Procedure, and the Law on Victim and Witness Protection.

### 2.1.3.10 Law on Child Rights

The law coordinates relations with respect to the protection of child rights. It applies to all children under the age of 18 years. Child rights include the right to live, to develop, to be protected from the worst forms of child labor, and to participate in social life. Also, the law outlines duties of children, government, parents, guardians, caregivers, individuals, economic entities, and organizations.

### 2.1.3.11 Law on Child Protection

The law identifies the relationships between the national child protection system and its stakeholders, and regulates relations with respect to the prevention of, protection against, and response to all forms of child violence, sexual exploitation, and harassment.

### 2.1.3.12 Law on Labor

The law determines the general rights and duties of employers and employees who are parties to labor relationships based on a contract of employment, collective agreement, or collective bargaining, and provides rules with respect to collective or single employee labor disputes, working conditions, management, monitoring and supervision, and liabilities for violation of the law, and aims to ensure the mutual equality of the parties. The law prohibits gender-based discrimination in employment and contains sections protecting the rights of pregnant and nursing women. The law does not explicitly address sexual harassment at work which is addressed in the Gender Equality Law of Mongolia.

Article 109. of the Law on Labor deals with the employment of minors

- 109.1 A person who reaches 16 years of age has the right to conclude a contract of employment.
- 109.2 Except as otherwise provided in Article 109.5, a person who reaches 15 years of age may conclude a contract of employment, if permitted by his parents or guardians.
- 109.3 A person who reaches 14 years of age may enter into a contract of employment for the purpose of acquiring vocational training and work experience, but only with the consent of his parents or guardians and the State central administration organization in charge of labor issues.
- 109.4 An employer shall not employ a minor in a job which will adversely affect his intellectual development or health.
- 109.5 A list of work for which a minor may not be employed shall be established by the Member of the Government responsible for labor matters.

Article 110 relates to the protection of the health of a minor employee

- 110.1 A minor employee may be employed subject to the approval of the relevant medical authority after he has undergone a medical examination, and further biennium medical examinations shall be required until he reaches 18 years of age.
- 110.2 A minor employee may not be required to perform overtime work or to work on public holidays or weekends.
- 110.3 A minor employee may not be required to perform work under abnormal working conditions.
- 110.4 A minor employee may not be required to lift or carry loads that exceed weight limitations established by the Member of the Government responsible for labor matters.

### **2.1.3.13 Law on National Human Rights Commission**

The law defines the principles and legal basis for the National Human Rights Commission of Mongolia, and regulates relations with respect to the protection of and prevention of violations of human rights and freedoms in Mongolia, and the promotion of human rights education in Mongolia.

### **2.1.3.14 Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad**

The law regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests. It reinforces provisions of the Constitution of Mongolia, the Labor Law, and legal status of a foreign citizen, the Social Insurance Law, and other related legal acts.

### **2.1.3.15 Law on Social Welfare**

The Law regulates relationship in connection with establishing of social welfare pension, allowances, and types of services, determining coverage framework of social welfare, forming social welfare fund, spending the fund's capital, providing social welfare and social development services, and defining the structure and function of social welfare organizations.

### **2.1.3.16 Health and Safety Legislation**

In addition to environmental and social laws and regulations, there are occupational health and safety laws and regulations with which proposed activities must comply:

- Article 16 of the National Constitution of Mongolia states that every employee has the right to "suitable conditions of work."
- The Mongolian Labor Code (1999) is the main piece of legislation guiding employment in Mongolia. It covers collective contracts and agreements, labor contracts, remuneration, working hours, working conditions, public holidays, vacations, safety, employment of minors and the disabled, dispute resolution, and labor monitoring by the state.
- The government adopted a National Program for Occupational Safety and Health Improvement in 2001 and national standards were also adopted, such as the National Standard on Occupational Health and Safety (Mongolian National Standard [MNS] 5002:2000).
- The *Law on Labor Safety and Hygiene* (2008) covers requirements for industrial buildings and facilities, requirements for machinery and equipment, requirements for hazardous chemicals and explosives, fire safety, medical checkups, personal protective equipment, and training, rights to favorable working conditions, and investigation of accidents and occupational diseases.

### **2.1.3.17 Agreement on Protection and Use of Transboundary Waters**

The Agreement on Protection and Use of Transboundary Waters was entered into by and between Mongolia and the Russian Federation in 1995. For the purposes of the agreement, the term *transboundary waters* is defined as "rivers, streams, lakes, and other surface waterbodies, as well as groundwater deposits through which the state border passes or crosses." *Negative impact* is defined as any significant harmful effects on the environment, humans, and material objects caused by human activities whose physical source is located on the territory of the other party."

The agreement specifies that the two states will cooperate regarding the protection and use of transboundary waters in the following areas:



- Rational use and protection from pollution and depletion of the water resources of transboundary waters for the purpose of their environmentally sound management
- Study of water, hydrochemical, hydrobiological and channel regime of waterbodies, water resources, and their quality
- Exchange of hydrological information and forecasts in order to prevent floods and their negative consequences
- Study and assessment, as well as forecasting the status of transboundary waters
- Development of methods and technologies for the prevention and elimination of the dangerous consequences of floods and other negative effects of water
- Protection of transboundary waters from pollution
- Providing conditions for the natural migration of fish and other aquatic animals

Under the agreement, the parties are to take “appropriate measures to prevent, limit, and reduce the negative impacts on transboundary waters during water management and other activities on their territory.” However, the agreement does not include provisions addressing responsibility of one party for transboundary harm caused to the other and requiring compensation for such harm.

As mentioned in Section 1.1, MCA-Mongolia seeks to expand the availability of drinking water in UB by proposing and implementing the BWSE project in the Upper Tuul River Basin. The Tuul River originates in Khan-Khentii Nature Reserve in the Khentii Mountains in Erdene soum of Tuv aimag. The Tuul River flows into the Orkhon River, which flows into the Selenga River, and the Selenga then flows into Russia and finally into Lake Baikal.

## **2.1.4 Institutional Framework**

The State Great Khural of Mongolia is the highest state power and the supreme legislative power. The State Great Khural is unicameral (i.e., has a single legislative chamber) and consists of 76 members elected by the mixed electoral system.

### **2.1.4.1 Ministry of Environment and Tourism**

MET is the agency primarily responsible for the implementation of environmental policy in Mongolia. Agencies under MET with responsibility for environmental protection and management include:

- The Department of Green Development Policy and Planning is responsible for developing national advocacy, legislation, policies, strategies and programs on environmental protection and green development in accordance with the sustainable development goals of the country; developing financial and investment plans; and providing comprehensive policy guidance. Additional responsibilities include coordination across sectors to promote green development consistent with ecological principles; planning and initiation of regional and international participation of Mongolia in solving global environmental challenges; and development of policies, programs, and projects that introduce clean technologies, and scientific and technological achievements.
- The Department of State Administration and Management is responsible for administration and leadership in MET. Its functions include addressing human resource management and development issues, providing legal advice, introducing best practices for administration in the ministry, developing systems of reporting and accountability, resolving appeals and complaints, and improving organizational management. The department focuses on ensuring the continuity and stability of MET operations by way of professional and disciplined departments, developing human resource policies and improving the effectiveness of their implementation, and developing guidelines and recommendations on required future courses of action.



- The Department of Environment and Natural Resources is responsible for the planning and implementation of actions to reduce environmental degradation and adverse environmental impacts, and ensuring the appropriate use of natural resources. Its functions include implementing laws, regulations, policies, programs, and activities related to the conservation and appropriate use of natural resources; restoring areas that have suffered from degradation; organizing and coordinating biological conservation activities; conducting environmental assessments; maintaining the Environmental Information Databank; and organizing training and public awareness activities related to environmental conservation. Activities undertaken in this context include:
  - Reviewing EIAs
  - Monitoring the implementation of environmental monitoring programs, environmental protection plans, and rehabilitation programs of mines; receiving and reviewing annual reports on these activities; and issuing professional guidelines and recommendations on required future courses of action
  - Conducting environmental assessments and maintaining the state Environmental Information Databank
  - Maintaining a unified registry of very toxic, toxic, and harmful chemicals, and issuing authorizations for their manufacture and import
  - Coordinating household and industrial waste management policy, and managing air pollution
- The Department of Special Protected Areas Administration and Management has been entrusted with the responsibility of implementing the laws and regulations concerning Special Protected Areas. Its functions include coordinating activities related to the expansion of the Special Protected Area network and implementing associated programs, projects, and actions, as well as providing professional and practical assistance to the administrative authorities of Special Protected Areas. It focuses on ensuring the integration of policies and actions promoting sustainable natural resource use and ecological balance. These responsibilities are carried out by developing partnerships with all organizations engaged in policy implementation, supporting the effective allocation of resources, and organizing and coordinating their activities in line with government policy, programs, and plans.
- The Ecologically Clean Technologies and Science Division is responsible for developing and promoting clean technologies in Mongolia by introducing cleaner technology to all aspects of production and services.
- The Department of Monitoring, Evaluation and Internal Auditing's responsibilities are to monitor and control the implementation of policy planning and its operational phases, evaluate results, create information databases, present statistical data, and foster transparency and information disclosure.
- The Department of Land and Water is responsible for implementing government policy and decisions related to the sustainable use, protection, and restoration of land and water resources in Mongolia; signing and monitoring the implementation of contracts and agreements, in the name of MET, with relevant foreign and domestic organizations, companies, and individuals; collecting fees and payments for the use of land and water resources and allocating these according to the appropriate procedures; and allocating and reporting on the use of funds for the conservation and restoration of land and water resources.
- The National Agency for Meteorology, Hydrology and Environmental Monitoring is responsible for managing a national, integrated hydrological, meteorological, and environmental monitoring network; ensuring preparedness for potential natural disasters or major pollution incidents; establishing conditions to permit the full and complete use of meteorological and hydrological resources; continuously monitoring radioactivity, air, and water pollution, and soil contamination levels; and providing essential hydrological,

meteorological, and environmental data to state and government officials, businesses, and individuals.

- Water Authority as Implementing Agency under the MET of Mongolia was established by the Government Resolution No. 121 dated April 1, 2020. The Water Authority's operational strategy and restructuring program has been under the discussion for approval. Assuming that the agency is committed to increase water use and resources through research and analysis in the water sector and promoting expertise of the professionals, there would be a significant progress in addressing the sector's challenges.

#### **2.1.4.2 State Professional Inspection Agency**

The State Professional Inspection Agency is responsible for ensuring the implementation of the relevant laws and legislations in the territory of Mongolia to provide a healthy and safe environment for citizens, to promote access to quality products and services, to support human and social sustainable development, and to create a favorable environment for business sectors. In addition to the key departments, the Agency manages the national food safety reference laboratory, local inspection units in all 21 aimags and border control points. It has following divisions:

- Special Inspection Department of Labor and Social Protection
- Inspection Division on Health, Education and Culture
- Inspection Division on Infrastructure
- Inspection Division on Food Security and Agriculture
- Inspection Division on Environment, Geology and Mining
- Inspection Division on Export, Import and Border Examination
- Inspection Division on Nuclear and Radiation Security

#### **2.1.4.3 Ministry of Labor and Social Protection**

The Ministry of Labor and Social Protection is the governing body that has primary responsibility for implementing social welfare and protection policy in Mongolia. The mission of the ministry is to ensure human development through implementing a series of related policies on labor and population development and social protection, creating a favorable working and development environment for citizens, and improving social security. The Ministry has the following departments, agencies, and offices:

- The Public Administration Department has the primary responsibility to:
  - Provide leadership in public administration
  - Provide legal and internal services
  - Provide the necessary information, advice, and support and develop external cooperation in this regard
  - Provide professional and methodological advice on the concept and drafting of legislation, elimination of duplicate laws, and compliance with the law
  - Provide legal and internal support to the minister and the management team for making decisions
  - Conduct financial activities and accounting
  - Carry out foreign trade cooperation and coordinate and support the implementation of international agreements
- The Policy and Planning Department has the primary responsibility to ensure human development through the implementation of a comprehensive set of policies related to

employment, population development, and social protection, creating a favorable working environment for citizens, and enhancing social security. It has roles and responsibilities to:

- Develop policies, strategies, and drafts of labor and social protection laws, and planning of sector finance, economics, investment, and production policies
- Plan short- and midterm, strategic policies and legislation in the area of labor and social protection
- Provide draft guidelines and policy guidelines for law proposal and drafting
- Plan, manage and coordinate the budget, organizing the implementation of industry investment, production policies and directions

The Department has the following divisions: Employment Policy Division; Social Security Policy Division; and Investment and Production Division.

- The Population Development Policy Implementation Department has the main functions of legislation, strategic mid- and short-term policy planning, and implementation and monitoring aimed at ensuring the development of the population and its groups including children, youth, the elderly, families and the disabled. It drafts laws, policies, strategies, programs and programs to support the development of population groups; develops and coordinates project implementation; and provides public-private partnerships. The Department also assists the National Committee on Gender Equality through advisory and organizational support and the implementation of gender policies and decisions.
- The Employment Policy Implementation Department has the primary responsibility to organize and coordinate the implementation of legislation, policies, strategies and programs on employment and vocational education and training, developing and implementing a program of measures to promote employment. Other responsibilities include:
  - Provide policy guidance and qualifications
  - Develop and implement programs and projects to promote employment and reduce unemployment rates, reduce poverty and create sustainable jobs
  - Coordinate the policies of recruitment and expulsion of foreign workers, and promote the employment of foreign citizens
  - Ensure implementation of the law on vocational education and training, quality assurance and accreditation, developing proposals for updating vocational education standards and curriculum, implementing policies for the development of a national qualification system, and providing professional and methodological support
- The Labor Relations Policy Department is responsible for:
  - Planning the development of labor relations
  - Organizing and regulating the implementation of policies
  - Assisting in the development of labor laws, policies, and decisions
  - Implementing and coordinating tripartite social relations partnership policies
  - Organizing and coordinating labor policies, standards, and draft decisions
  - Organizing and implementing labor standards, international conventions, and recommendations
- The Social Protection Policy Implementation Department is responsible for developing proposals to update and improve social protection laws; providing procedures, recommendations, methodologies, instructions, and formulas related to the implementation of social protection legislation; and ensuring the implementation of state social protection policy in Mongolia.
- The Vocational Education and Training Policy Department is responsible for conducting research and implementing national laws and regulations to improve quality, access and

benefits of vocational education that meets Mongolian development policy and labor market demands, as well as the needs, talents and interests of citizens.

- The Monitoring, Evaluation and Internal Audit Department has duties to improve planning, implementation and budget expenditure efficiency through monitoring and evaluation of legislation, policies, projects, programs and activities of the labor and social protection sector and internal audit.
- The Family, Youth, and Child Development Agency's priority activities include:
  - Implementing development policies to support family stability and improve quality of life, reduce adverse factors, and offer family development services in line with international standards
  - Providing methodological support to local units and affiliated organizations to ensure the implementation and promotion of state policies, laws, and programs on child protection; promote the development and participation of children; prevent risks and violence; and provide inter-sectoral coordination in the provision of social services
  - Promoting advocacy, co-operation, and partnership aimed at creating, preventing and promoting a social environment that favors youth development, participation, and leadership
- The Labor and Social Services Agency aims to promote employment and family earnings, reduce poverty, strengthen the vocational education and training institutions and improve the quality of life of Mongolians through improving access and quality of social welfare and provision of job opportunities.
- The Social Insurance General Office aims to provide favorable conditions for citizens and insureds to receive their pensions and benefits by providing them with prompt professional services, expanding their social insurance coverage.
- The Research Institute of Labor and Social Protection has carried out research, studies and analysis in various fields, including policy of employment, social protection and population development. The Institute has also provided policy suggestions for policy makers.
- The Occupational Safety and Health Center is a public service organization affiliated to the Ministry of Labor and Social Protection, which has main responsibilities to:
  - Study and evaluate working and hygienic conditions at workplaces of all types of business enterprises and organizations operating in the territory of Mongolia
  - Provide recommendations on measures to reduce and eliminate hazardous factors in the workplace
  - Promote healthy and safe behavior for employees
  - Conduct early detection, treatment and prevention of occupational disease
  - Provide employment opportunities for disabled who have lost their ability to work due to occupational disease

#### **2.1.4.4 Mongolian Gender Policy**

Mongolia has made significant progress in ensuring an equal status of women and men under the law and addressing the gender gap. Article 14 and 16 of its Constitution institutes gender equality by stating "Men and women have equal rights in the political, economic, social, cultural life and family relations... everyone shall be free from any discrimination. Several laws and regulations related to gender equality have been passed, the most important being the 2011 Law on Promotion of Gender Equality and its mid-term strategy along with Action plan for implementation.

In 2017, the National Program on Gender Equality was adopted by the Government of Mongolia with main objectives to promote gender-responsive policy and planning, increase public

awareness, and undertake systematic measures to eliminate gender-based discrimination to ensure effective implementation of Law on Promotion of Gender Equality. Additionally, the National Committee on Gender Equality has main functions including formulation, implementation, and monitoring of gender policies, programs and special measures; to define economic and legal measures necessary for the implementation of the gender equality policy; to review and to issue recommendations; strengthening the necessary national institutional capacity for promotion of gender equality etc. Gender discrimination and sexual harassment related issues are reflected in the Law on Families, the Labor Code, and Law on promoting Employment, Package of Laws on education, the Health Law, the Law on Child Protection, the Law on Combating Domestic Violence, and the Law on Combating Human Trafficking and Law on Infringement.

The GoM has integrated gender equality in its medium- and long-term planning documents such as the Government of Mongolia's Action Plan (2016-2020), Sustainable Development Goals 2030 (updated to Vision 2050), Green Development Policy and its implementation plan (2015-2030).

MCUD applies the following gender strategy (MCUD, 2017), 2018-2025 Construction and Urban Sector gender Responsive Policy

- To plan urban and built-up land with gender equality in mind, and to strengthen the national capacity for development.
  - Gain knowledge and strengthen the capacity for gender sensitive planning, implementation, monitoring, and evaluation of the construction and urban sectors.
  - Create awareness and capacity for integration of the concept of gender equality in the construction and urban development sector.
  - Expand and develop a system of gender sensitivity in the construction and urban development sector
  - Develop legal and policy framework for the construction and urban development based on gender sensitive research and analysis
  - Introduce gender indicators related to employees, consumers, products and services in the construction and urban area monitoring system.
- To support workers in construction industry and provide proper employment with gender sensitive human resource strategy
  - A full range of activities will be organized and created to raise awareness and enable the employees to work in a gender-sensitive environment, and improve the workplace for male and female employees.
  - Establish a common understanding and consensus on gender-sensitive policies and establish policies on decent working conditions and human resource development.
  - Develop a human resource database separated by age and gender and support further development of the database.
  - Develop mechanisms to receive gender discrimination complaints, prevent, and eliminate gender issues at organizational level.
  - Spread “Humancentric and Socially responsible” management model to support gender equality in public and private sectors.
  - Introduce technological advancements and developments to improve workplace environment and increase number of jobs for women and disabled people.
- To improve stakeholder’s engagement in order to improve gender equality in construction and urban development sector
  - Improving the participation of women and men and establishing partnerships and cooperation to support and promote gender-sensitive policy in the construction and urban planning sectors.

- Developing a set of gender-sensitive health and safety indicators for urban dwellers – Developing standards for the quality of life and promoting those standards to stakeholders.
- Improving the capacity and opportunities for women and men in planning the construction and urban development.
- Promoting further development of gender-responsive policy in the construction and urban development sectors by partnership and co-operation.

The Ministry of Environment and Tourism (MET) applies the following gender strategy (MEGD, 2014):

- Create capacity and skilled resource for gender analysis and environment planning.
  - Have a common understanding and agreement of incorporating gender equality concepts in the strategic goal of environmental sector.
  - Develop gender analysis and gender sensitive planning in environmental sector.

Gender analysis is needed to ensure that policies and programs are efficient, effective, and it helps to reflect the needs of women, men, and communities. It's also crucial for eliminating gender inequalities in society and improving the quality of life. In order to develop sex-disaggregated statistics, checklists, gender indicators, and gender equality surveys and to use them for policy planning, all stakeholders will need to have a common understanding and have united approach and method.

- To promote gender equality in the management of environmental sector.
  - Incorporate gender equality concepts in legal and policy frameworks within environmental sector.
  - Improve the participation of implementers, including women, at all levels in policy making and planning in the environmental sector.
  - Improve the concept of gender equality between the environmental and local development policy.

In the field of environmental sector policies, planning, and at all stages of their implementation, women and men working in the sector need to be able to participate and collaborate effectively. In order to do this, sectoral organizations should create an environment and culture that ensures gender equality and open source feedback. The environmental sector policy planning will need to be developed in a holistic way, consistent with the local development policy to make changes in the lives of men and women of society.

- Open up opportunities for women, men, and communities to participate in green development and receive its benefit from these opportunities.
  - Make environmental information and data more accessible and increase the participation of women, men and communities.
  - Engage and collaborate with local communities, groups, academic institutions, NGOs and international organizations more effectively for environmental sector policy planning, implementation and evaluation.
  - Increase the number of green jobs that meet the needs of women, men, and communities.

Residents and organizations in urban and rural areas should be considered as the drivers of green development and be able to have access to a more meaningful and useful participation opportunities in the environmental sector. To do this, it is important to consider the needs of local groups and general population.

## 2.2 Applicable Standards

The MNS prescribe allowable ambient and discharge standards for air, noise, water, and soil quality, as well as industrial effluent, wastewater, and boiler emissions. The MNS standards are shown in Appendix A, Table A-1. Relevant MNS are discussed below.

### 2.2.1 Use of International Environmental Standards

International standards of the World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines) are referenced in the IFC Performance Standards. The EHS Guidelines contain effluent discharge, air emissions, and other numerical guidelines and performance indicators as well as prevention and control approaches that are normally acceptable to IFC and are generally considered to be achievable at reasonable costs by existing technology. When host country regulations differ from these levels and measures, the borrower/client is required to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client is required to provide justification for any proposed alternatives. The EHS Guidelines include General EHS Guidelines (covering environment; occupational health and safety; and community health and safety) and *Industry Sector Guidelines*.

### 2.2.2 Ambient Air Quality

The Mongolian *Law on Air* regulates protection of ambient air, prevention of pollution, and reduction and monitoring of emissions of air pollutants. The Mongolian ambient air quality standards are presented at MNS 4585:2016. The World Health Organization (WHO) Air Emissions and Ambient Air Quality Guidelines are recognized international standards and are incorporated into the EHS Guidelines. In addition to guideline values, interim targets are given for each pollutant by the WHO as incremental targets in a progressive reduction of air pollution.

The WHO guidelines and corresponding Mongolian ambient air quality standards are presented in Appendix A, Table A-2. Generally, the MNS for ambient air quality are more stringent than or are equivalent to the WHO air quality guidelines or the respective interim target values, and are adopted for use in this ESIA.

### 2.2.3 Water

The EHS Guidelines recommend that discharges to surface water of process wastewater, sanitary wastewater, wastewater from utility operations, or stormwater should not result in contaminant concentrations in excess of local ambient water quality criteria. The MNS water and wastewater standards are adopted for use in this ESIA. Mongolian ambient water quality standards MNS 4586:1998 (Table A-3), Mongolian drinking water quality standards MNS 0900:2018 (Table A-4), and effluent wastewater quality standards MNS 4943:2011 (Table A-5) are included in Appendix A.

### 2.2.4 Groundwater

The Mongolian standards outlining the general requirements for protection of groundwater (MNS 3342:1982) indicate that the contamination of groundwater with industrial raw materials, products, and municipal wastes during transportation and storage is prohibited. Relevant requirements in the standards include:

- Raw materials and products for industrial and municipal waste storage tanks with potential to contaminate groundwater resources should comply with following:

- Geological-hydrogeological investigations and potential infiltration estimates of geological materials are required
- Groundwater protection measures are to be developed based on the amount and characteristics of the chemicals stored.
- Storage tanks are to be tested for leakage prior to use.
- Storage tanks cannot be established at the base of mountains, loops of rivers, riverbeds, and highly fractured parts of geological sediments which are used for drinking water.
- In case of groundwater contamination due to accidents, the damaged area should be determined and protected, the spill should be contained to limit further distribution, drinking water collection from the area should be prohibited, and traces of contamination should be expediently removed without further spillage.
- In the event of groundwater pollution or when the contamination reaches dangerous levels, the method of observation and control will depend on the groundwater quality, its intended use, and the potential consequences of the pollution.

There are no equivalent standards recommended in the EHS Guidelines and the MNS is adopted for use in this ESIA.

## 2.2.5 Noise

Mongolian Noise Standards are set out in the national standard MNS 4585:2016. These standards are comparable to the international guidelines from the WHO, as presented in the EHS Guidelines (see Table A-6 in Appendix A).

## 2.2.6 Special Protected Areas

The *Law on Special Protected Areas* (November 15, 1994) is intended to protect the natural landscape, rare fauna and flora, historical and cultural sites, and natural sightseeing sites. The law classifies state Special Protected Areas into four categories: i) strictly protected areas; ii) national parks; iii) nature reserves; and iv) natural monuments. Strictly protected areas are further divided into three zones based on natural forms; features of soil, water, fauna, flora; and their vulnerability to human activities: i) pristine zone; ii) conservation zone; and iii) limited use zone.

In the pristine zone, only protection activities conformant with the need to preserve the original natural features may be conducted; the only research and investigation activities that may be conducted include observation that does not cause any damage to the natural features. All other activities are prohibited within this zone. In the conservation zone, biotechnological measures that use environmentally safe technologies may be implemented to enhance flora and fauna reproduction and to mitigate damages caused by natural disasters. The following activities may be conducted in the limited use zone using environmentally safe technologies and with appropriate licenses or permits:

- Soil and plant cover restoration
- Forest maintenance and cleaning
- Animal inventories and activities to regulate animal population numbers, age, sex, and structure, following an approved program and methods
- Use of mineral water and other treatment and sanitation resources
- Ecotourism following designated routes and within designated areas, according to appropriate procedures



- Use of accommodations according to appropriate procedures and designated for temporary residence, camping, observation, research, or investigation by travelers or other people with permission
- Taking photographs, making audio and video recordings, and using them for commercial purposes
- Worshipping natural sacred sites and conducting other traditional ceremonies
- Collection and use of the associated natural resources and medicinal and food plants, according to established regulations, for household needs

## 2.3 International Requirements

According to MCC policy, the projects funded by MCC are expected to be designed and operated in compliance with international good practices and applicable regulatory requirements, and environmentally sound. Moreover, MCC is committed to ensuring consultation with affected parties and public disclosure of associated documents, and most importantly to the wellbeing of affected communities. This ESIA has been prepared in accordance with MCC (2010) Environmental Guidelines and (2011) Gender Policy, and IFC (2012) Performance Standards.

### 2.3.1 IFC Performance Standards on Environmental and Social Sustainability

IFC's Sustainability Framework (update effective January 1, 2012), is widely considered one of the most complete sets of policies and standards for integrating environmental and social management to avoid, mitigate, and manage risks and impacts.

This helps IFC clients develop their activities in a sustainable manner (Davis Polk and Wardwell LLP, 2017). The framework comprises the IFC Policy on Environmental and Social Sustainability and the related IFC Performance Standards, as well as IFC's Access to Information Policy.

The IFC Performance Standards define clients' responsibilities for managing their environmental and social risks. Summaries of the objectives of the standards and their applicability to the BWSE project are provided in Table 2-3.

Table 2-3 Applicability of the IFC Performance Standards and MCC Policies

IFC Performance Standard	Objectives	Applicability
<b>PS 1: Assessment and Management of Environmental and Social Risks and Impacts</b>	Identify and evaluate project's social and environmental risk and prepare mitigation measures, as well as engage stakeholders, and manage risks and impacts effectively.	<b>Applicable</b> In accordance with MCC Environmental Guidelines, the BWSE would be designated a Category A project. This triggers development of a full ESIA Report and disclosure accordingly.
<b>PS 2: Labor and Working Conditions</b>	Promote fair treatment, non-discrimination, and equal opportunity; provide guidance on relationship between management and workers; protect from forced and/or child labor; and promote safe and healthy working conditions.	<b>Applicable</b> Recognizing the roles of economic development in employment creation and income generation whilst recognizing the rights of workers, PS 2 has been guided by several international conventions and instruments, including those of the International Labor Organization (ILO) and the United Nations. Mongolia has adopted the ILO Minimum Age Convention and Convention on the Worst Forms of

IFC Performance Standard	Objectives	Applicability
		Child Labor. In all of its investments worldwide, MCC is mindful of potential risks to children, as well as underprivileged and disadvantaged populations.
<b>PS 3: Resource Efficiency and Pollution Prevention</b>	Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; promote more sustainable use of resources, including energy and water; and reduce project related greenhouse gases emissions.	<b>Applicable</b> To avoid or minimize pollution from project activities, and promote more sustainable use of resources, the BWSE would employ both best engineering practices typically undertaken by project proponents, construction contractors, or operators, and management measures implemented specifically in response to the impact findings of the ESIA and specified in the ESMPs.
<b>PS 4: Community Health, Safety, and Security</b>	Anticipate and avoid adverse impacts on the health and safety of the affected community during the project life from both routine and non-routine circumstances; provide guidance on safeguarding personnel and property in a manner that avoids or minimizes risks to the affected communities and in accordance with human rights principles.	<b>Applicable</b> Community health, safety, and security risks will be assessed in the ESIA and will be addressed in the ESMPs.
<b>PS 5: Land Acquisition and Involuntary Resettlement</b>	Avoid involuntary resettlement where possible and avoid forced eviction. Where resettlement or acquisition of land or other assets is necessary, the standard sets out requirements for participation in resettlement planning, mandates compensation for assets at replacement cost, and expects the borrower to ensure that incomes and standards of living of affected persons are improved or at least restored to what they were prior to displacement.	<b>Applicable</b> A land acquisition and resettlement plan (LARP) for any land taking or resettlement requirement of the BWSE has been prepared as part of the project RAP, which will be implemented prior to construction. The LARP identifies the potential future physical and economic displacement impacts associated with the project, and the compensation and resettlement principles and responsibilities to support meeting the PS 5 objectives and Mongolian requirements.
<b>PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</b>	Protect and conserve biodiversity; maintain the benefits from ecosystem services; and promote the sustainable management of living natural resources.	<b>Applicable</b> The BWSE may adversely impact Mongolian marmots ( <i>Marmota sibirica</i> <sup>6</sup> ), requiring that management measures be implemented to protect them.

<sup>6</sup> The Mongolian marmot is listed as endangered in the IUCN Red List of Threatened Species (International Union for Conservation of Nature and Natural Resources [IUCN], 2020).

IFC Performance Standard	Objectives	Applicability
		As Mongolian marmot ( <i>Marmota sibirica</i> ) is an endangered species therefore habitat can be classified as critical. However, no protected areas (except a locally protected Songinokhairkhan mountain) or forests are located within the BWSE Aol.
<b>PS 7: Indigenous Peoples</b>	Identify whether indigenous peoples are affected by the project and, if so, undertake specific consultation activities and avoid or mitigate impacts on this potentially vulnerable group.	<b>Not applicable</b> Investigation into the ethnic and tribal origins, languages, etc. and culture of inhabitants of the affected khoroos revealed that no Indigenous People as defined under PS 7 are located in the project Aol.
<b>PS 8: Cultural Heritage</b>	Protect cultural heritage from the adverse impacts of project activities and support its preservation. Promote the equitable sharing of benefits from the use of cultural heritage.	<b>Applicable</b> Conservation and protection of affected archaeological sites are required. However, no critical cultural heritage <sup>7</sup> sites are located in the project Aol.

## 2.3.2 MCC Requirements

### 2.3.2.1 Environmental Guidelines

The MCC Environmental Guidelines set forth the process for the review of environmental and social impacts to ensure that the projects undertaken as part of programs funded under MCC compacts are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and, as required by the legislation establishing MCC, are not likely to cause a significant environmental, health, or safety hazard. Section 605(e)(3) of the Millennium Challenge Act of 2003 prohibits MCC from providing assistance for any project that is “likely to cause a significant environmental, health, or safety hazard.” Further, Presidential Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*, January 4, 1979, requires environmental consideration for major federal actions that may affect the environment outside the geographical borders of the United States and its territories and possessions.

In 2012, MCC amended its Environmental Guidelines to formally adopt the IFC Performance Standards.

### 2.3.2.2 Gender Policy

The MCC Gender Policy requires that a compact-eligible country “analyze gender differences and inequalities to inform the development, design, implementation, monitoring, and evaluation of programs funded by MCC.”

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<sup>7</sup> Critical cultural heritage comprises the internationally recognized heritage used by communities for long-standing cultural purposes and/or legally protected cultural heritage areas (IFC 2012, PS 8).

Both the country and MCC are responsible for applying certain tools or procedures to ensure its compliance with the policy, including consultation as a tool for gender integration and gender integration throughout the stages of a compact. The country has the primary responsibility for integrating gender into the development, design, implementation, and monitoring of a compact program. The country is ultimately and primarily responsible for implementing the compact, including any components designed to address gender inequalities that limit women's or men's opportunities to participate in or benefit from projects.

### **2.3.2.3 Counter-Trafficking in Persons Policy**

MCC has a zero-tolerance policy with respect to trafficking in persons, the crime of using force, fraud, and/or coercion to exploit another person. For the purposes of the policy, trafficking in persons means (a) sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; or (b) the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.

Each Millennium Challenge Account, including MCA-Mongolia, is responsible for implementing Counter-TIP Minimum Compliance Requirements on all projects, with support and supervision from MCC. The requirements, defined in Annex A of the MCC Counter-Trafficking in Persons Policy, are incorporated into all solicitation documents and contracts for works, non-consulting, services, and consulting services.

### **2.3.3 IFC Environmental, Health, and Safety (EHS) Guidelines**

The IFC Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. The General EHS Guidelines are designed to be used together with relevant Industry Sector EHS Guidelines that provide guidance on environmental, health, and safety issues in specific industry sectors.

At the project or facility level, the guidelines present a hierarchical approach to the management of environmental, health, and safety issues that includes the following steps:

- Identifying environmental, health, and safety project hazards and associated risks as early as possible in the facility development or project cycle
- Involving environmental, health, and safety professionals who have the experience, competence, and training necessary to assess and manage environmental, health, and safety impacts and risks, and carry out specialized environmental management functions
- Understanding the likelihood and magnitude of environmental, health, and safety risks, based on the nature of the project activities and the potential consequences to workers, communities, or the environment if hazards are not adequately managed
- Prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment
- Favoring strategies that eliminate the cause of the hazard at its source
- When impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences
- Preparing workers and nearby communities to respond to accidents
- Improving environmental, health, and safety performance through a combination of ongoing monitoring of facility performance and effective accountability

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## 3. Environmental and Social Impact Assessment Methodology

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The BWSE would abstract 50 million cubic meters of groundwater per year. Hence, it is categorized as a Category A project, a project with the potential to cause significant negative environmental impacts, per the MCC (2010) Environmental Guidelines<sup>8</sup>. This designation triggers development of a full ESIA in accordance with the MCC Environmental Guidelines<sup>9</sup> and IFC Performance Standard 1 (PS 1), Assessment and Management of Environmental and Social Risks and Impacts<sup>10</sup>.

This section describes the methodology that has been followed to undertake the ESIA.

### 3.1 Objectives

With reference to the request for proposals for detailed design, ESIA, and RAP for BWSE (National Secretariat for Development of the Second Compact Agreement between the Government of Mongolia and the US Millennium Challenge Corporation [NatSec], 2018), the main ESIA objectives are to:

- Assess the potential environmental and social impacts and risks of the BWSE
- Prepare detailed ESMPs that specify management measures and associated monitoring to avoid, reduce to acceptable levels, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts

### 3.2 Scope of Work

To meet the objectives mentioned above, the scope of work for the ESIA entails:

- Regulatory Review – Assess the regulatory framework within which the project would operate, including reviewing applicable local, state, national, and international environmental, social, and health and safety legislation and standards.
- Environmental and Social Baseline – Collect baseline data during the field study with respect to environmental components, socioeconomic profiles, and ecology. Supplement the baseline field data with secondary data obtained through document review with respect to meteorology, soil quality, land-use, geology, geomorphology, hydrology, ecology, and socioeconomic profiles in the study area.
- Impact Assessment – Identify and characterize conditions and evaluate potential impacts for various environmental and social sensitivities due to the project activities anticipated during land acquisition and preconstruction, construction, operation and maintenance, and decommissioning.

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<sup>8</sup> The MCC Environmental Guidelines classify as Category A projects those with the potential to have significant adverse environmental and social impacts that are sensitive, diverse, or unprecedented; and list as an illustrative example of such projects groundwater abstraction projects or artificial groundwater recharge schemes in cases where the annual volume of water to be abstracted or recharged amounts to 10 million cubic meters or more.

<sup>9</sup> The MCC Environmental Guidelines stipulate that for Category A projects MCC will require an ESIA in accordance with the guidelines.

<sup>10</sup> IFC Performance Standard 1 stipulates that for greenfield developments or large expansions with specifically identified physical elements, aspects, and facilities that are likely to generate potential significant environmental or social impacts, the client will conduct a comprehensive ESIA, including an examination of alternatives, where appropriate.

- Public Consultation and Stakeholder Engagement – Develop and implement a consultation process and communication strategy to consult all stakeholders (including affected persons) and keep them informed throughout all stages of the ESIA.
- Environmental and Social Management Plans – Develop ESMPs that specify management measures addressing:
  - Environmental management
  - Waste management
  - Counter-trafficking in persons
  - Prevention of gender-based violence
  - Prevention of child labor
  - Labor employment
  - Health and safety management
  - Community health and safety
  - Risk control and emergency response
- ESIA Report – Prepare a draft ESIA for review by MCA-Mongolia and MCC and update based on comments, and final ESIA to be submitted to MCC for final determination.

Decommissioning refers to making a project inoperative and dismantling the structural elements or components at the end of the project lifecycle. IFC PS 1 specifies that, where applicable, the potential risks and impacts of project decommissioning are to be considered. The contract between MCA-Mongolia and AECOM for detailed design, ESIA, and RAP for BWSE also requires consideration of the decommissioning phase.

However, as UB always will require water and therefore a bulk water system, effectively the useful life of the project would not end and the system would not be decommissioned. Rather, when needed, the bulk water system would be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. Therefore, the ESIA team eliminated decommissioning from detailed study. Nonetheless, Section 5.3.3 presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

## 3.3 Methodology

The ESIA followed a systematic process that predicts and evaluates the impacts the project potentially would have on the physical, biological, socioeconomic, and cultural environment, and identifies management measures that the project will implement providing BWSE is approved and executed. The ESIA methodology follows the overall ESIA approach illustrated in Figure 3-1.

### 3.3.1 Screening and Scoping

The initial screening of the project was undertaken during the feasibility study and implementation of the attendant environmental and social baseline study (AECOM, 2018b). Requisite to this ESIA, additional screening was conducted through review of project documents and a desktop study of the project sites prior to the site visits. This was undertaken to gain a high-level understanding of the project sites and on-site and nearby off-site environmental and social resources, and to anticipate potential impacts. The screening entailed reviewing project documents, available

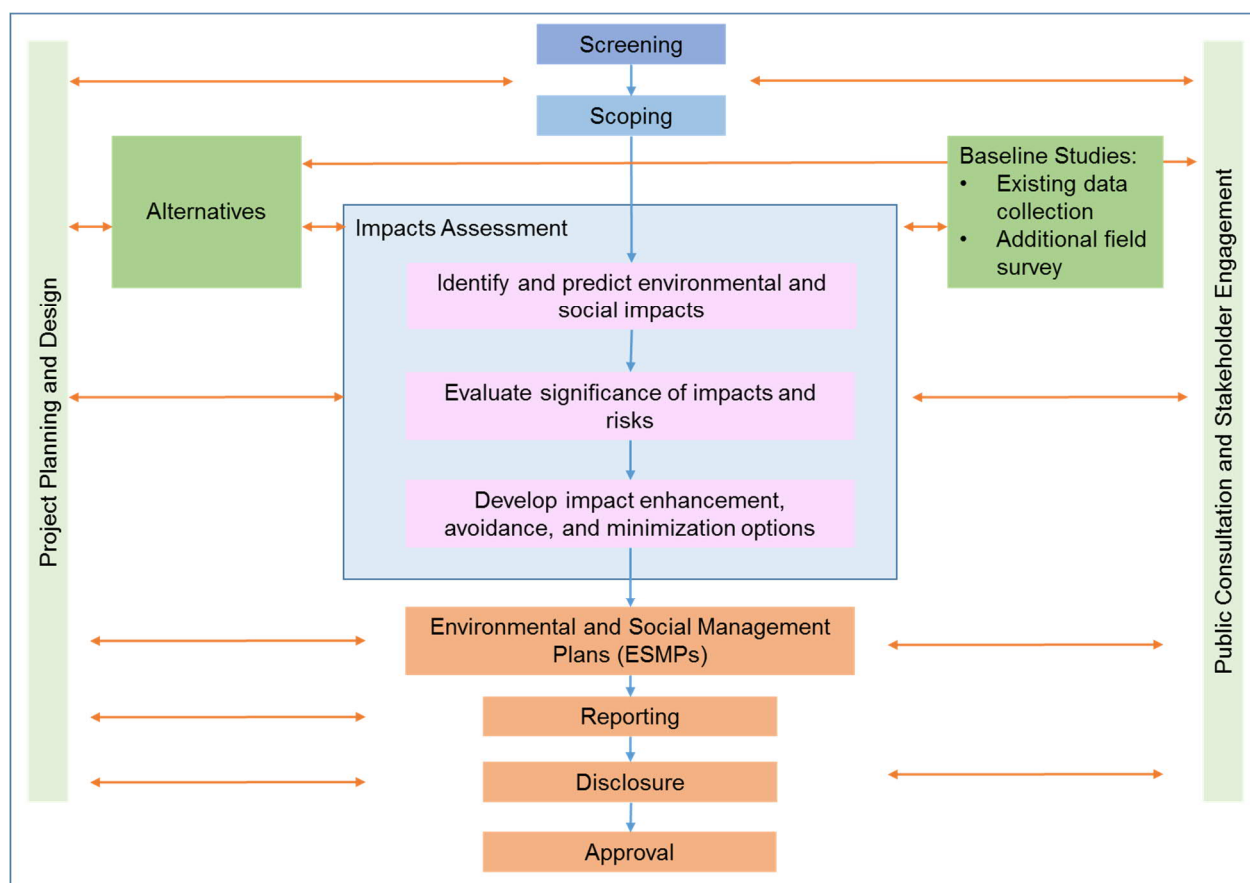


research documents and studies, and datasets to identify potential impacts and to scope further investigations required.

The outputs from screening informs the scoping of the impact assessment and intensive field investigations. The outputs of the screening and scoping are documented throughout the ESIA, primarily in Section 6 *Baseline Data Conditions* and in documentation of field investigations in various appendices.

Following screening, scoping was undertaken to provide further detail of potential impacts of project activities using additional engineering and baseline data. The main objective of scoping is to determine the environmental and social issues on which the ESIA study will focus by reviewing the project information and ascertaining likely issues associated with the project activities.

Scoping focuses the impact assessment on issues that are most important to decision making and stakeholder interests. This process helps in identifying all the relevant environmental and social issues in compliance with the MCC Environmental Guidelines and the IFC Performance Standards in the ESIA study.



**Figure 3-1 Overall ESIA Methodology**

### 3.3.1.1 Area of Influence

Scoping supports identifying the overall Aol for the BWSE project as explained in Section 1.2, potential interactions between the project and resources/receptors in the overall Aol, and the impacts that could result from these interactions, as well as prioritizing these impacts in terms of their likely significance. The geographical extend of each receptors Aol is specified in Section 6.

### 3.3.1.2 Receptors

Receptors are mainly affected positively or negatively by project activities and implementation. The categories of potential receptors in ESIA are identified as:

- Humans (local communities, local economy, etc.)
- Environmental components, both living (habitat, flora, fauna, etc.) and non-living (air quality, water bodies, landscapes, etc.)
- Cultural heritage components (archeological sites, etc.)

Potential environmental component receptors are determined through both in-house investigations and field-based surveys as part of the ESIA for their sensitivity to the potential impacts of the project activities. However, human receptors are identified based on public consultation and stakeholder engagement activities, by focusing on impacts to livelihood condition, and impacts of physical and economic displacement and resettlement on local communities (see Section 4).

### 3.3.2 Impact Assessment Framework

The impact assessment process initially involved identifying the project activities and the potential environmental and social impacts resulting from those activities during each project phase. The process for assessing potential project impacts is illustrated in Figure 3-1 and involved:

- Impact identification and prediction
- Significance evaluation
- Impact enhancement, avoidance, and minimization

#### 3.3.2.1 Nature and Type of Impacts

Whether an impact is considered to be positive or negative (impact nature), and the way in which it is related to the project (impact type: direct, indirect, induced, and cumulative) are central to the ESIA process. Impact types comprise:

- **Positive or Negative** – Impacts of a proposed action can be positive or negative. A positive impact is one having beneficial outcomes on an environmental or social resource. A negative impact is one having adverse, unfavorable, or undesirable outcomes. A single action might result in positive impacts on one environmental or social resource and negative impacts on another resource.
- **Direct or Indirect** – Impacts can also be direct or indirect. A direct impact is caused by an action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by an action but might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.
- **Induced** – Indirect impacts may include induced impacts, which are caused by changes in land use, or population density or growth rate that result from the proposed action, and the effects of those changes on resources.
- **Cumulative** – Cumulative impacts result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned, or reasonably defined developments at the time the risks and impacts identification process



is conducted. IFC PS 1<sup>11</sup> stipulates that cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from affected communities.

### 3.3.2.2 Impact Magnitude

Impact magnitude measures the change from baseline conditions that is predicted to occur in a resource or receptor. This measure of change is described in terms of its:

- **Intensity** – Severity of the impact (i.e., degree to which the proposed action would affect the resource or receptor)
- **Extent** – Spatial extent of the impact (e.g., site, local, regional, national, or international)
- **Duration** – How long the impact will interact with the receiving environment (e.g., temporary, short-term, medium-term, long-term, or permanent)
- **Frequency** – How often the impact will occur (e.g., once, occasionally, regularly, frequently, continuously)

Assessment of the overall magnitude of impact, therefore, takes into account all the dimensions of the impact — i.e., intensity, extent, duration, and frequency — to determine whether an impact is of **negligible**, **low**, **medium** and **high** magnitude.

### 3.3.2.3 Receptors Sensitivity

Receptor sensitivity is the degree to which a particular receptor is vulnerable to impact by the project activities. It is determined by considering the resilience of the receptor to any changes that result from the project activities and the value of the receptor.

Receptor resilience is the ability of the receptor to resist adverse impacts; whereas, receptor value takes into account the subject receptor's quality and importance relative to all identified receptors. The quality and importance of the receptor are determined to take into consideration, for example, the receptor's conservation status at a national and international level, its habitat condition (i.e., natural, modified, or critical), and its economic value.

Receptor sensitivity is determined for all receptors identified in Section 3.3.1.2 based on specific criteria. The specific criteria for estimating receptor sensitivity are described in the relevant impact assessment subsections in Section 7.

### 3.3.2.4 Impact Significance

The depth of analysis of impacts to a resource is proportionate to the likely magnitude of potential impacts; e.g., discussion of routine noise impacts commonly associated with construction projects would be briefer and less detailed than discussion of potential impacts to the Tuul River ecosystem and human users due to increased groundwater withdrawals. The impact evaluation separately describes potential short-term (construction related) and potential long-term (operation and maintenance related) impacts to the natural and human environments.

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<sup>11</sup> IFC PS 1 Footnote 16.

In this ESIA, impact magnitude and receptor sensitivity have been used to assess impact significance taking into account the nature and type of impacts as defined in the Section 3.3.2.1 and in Table 3-1 for impact assessment definitions.

**Table 3-1 Impact Significance Matrix**

		Receptor Sensitivity			
		Negligible	Low	Moderate	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible	Low
	Low	Negligible	Low	Low	Moderate
	Medium	Low	Low/Moderate	Moderate	High
	High	Moderate	Moderate	High	High

The following definitions were used to evaluate the significance of predicted adverse environmental and social impacts:

- **Negligible** – No change to the environmental or social resource.
- **Low** – Adverse effects either are non-detectable or, if detected, are well within natural or normal variability and do not appreciably affect the extent or value of the environmental or social resource. Adverse impacts are easily absorbed without mitigation or long-term consequences.
- **Moderate** – Adverse effects are clearly detectable, but they approximate natural or normal variability and do not appreciably affect the extent or value of the environmental or social resource. Adverse impacts with mitigation applied are easily absorbed without long-term consequences.
- **High** – Adverse effects exceed natural or normal variability, and appreciably affect the value or extent of the environmental or social resource. The impacts likely affect the viability of the resource or, as the impacts are highly uncertain or involve unique or unknown risks, the future viability of the resource is in question. Full mitigation of adverse impacts is not possible or mitigation success is not likely, and long-term deterioration of the resource may be unavoidable.

Potential beneficial or positive impacts were identified but were not evaluated in terms of their significance. Impact summary tables for each project phase were prepared and are presented in Section 7.

### 3.3.2.5 Gender and Social Inclusion Assessment

In the identification and assessment of social impacts resulting from project activities, gender and social inclusion are key criteria to support the project offering equal opportunity to all community members. Therefore, gender and social inclusion assessment (GSIA) is included, focusing on integrating gender and social inclusion into the scoping and performance of the ESIA, and including a gender strategy in the project activities and monitoring.

GSIA achieved these goals through collecting sex-disaggregated data on gender and social inclusion to establish a GSIA baseline within the baseline socio-economic survey, identifying and

analyzing positive and negative impacts of the project on both women and men, as well as formulating mitigation measures to address the project's adverse impacts on women and men.

### **3.3.2.6 Best Engineering Practices**

Best engineering practices are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA. These practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. Their implementation is assumed in the impact analysis presented in this ESIA.

For construction activities, the applicable best engineering practices are detailed as technical specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Appendix L presents those technical specifications that the ESIA team assumed would be taken by the construction contractors and would avoid or minimize potential adverse environmental and social impacts.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed.

### **3.3.2.7 Impact Enhancement, Avoidance, and Minimization**

Consistent with the IFC Performance Standards, the ESIA and the ESMPs adopt “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize<sup>12</sup>, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.” This mitigation hierarchy is widely recognized as a good practice for managing environmental and social risks.

As part of the ESIA process, the ESIA team formulated management measures to:

- Avoid, minimize, or offset potential significant adverse environmental and social impacts of the BWSE consistent with the mitigation hierarchy
- Reinforce or enhance potential beneficial impacts

Management measures differ from best engineering practices in that they would be implemented specifically in response to the impact findings described in the ESIA.

To formulate management measures, the ESIA team worked with the engineering design team to identify feasible and cost-effective approaches to mitigate identified negative impacts from project activities and enhance positive impacts. Once feasible and cost-effective mitigation measures were identified and evaluated, the ESIA team reassessed the potential impacts, identifying the residual impacts that would remain after mitigation, and identifying and evaluating additional management measures to offset the adverse residual impacts, as feasible. If mitigation measures would not be feasible, cost-effective, or sufficient, compensatory measures were formulated.

The management measures and, as needed, compensatory measures are specified and detailed in the ESMPs (see Section 3.3.4).

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<sup>12</sup> In accordance with IFC PS 1, acceptable options to minimize impacts vary and include: abate, rectify, repair, and/or restore.

### 3.3.3 Public Consultation and Stakeholder Engagement

As indicated in Figure 3-1, the public consultation and stakeholder engagement process interacts with effectively all elements and stages of the ESIA process, from early screening and scoping to developing the ESMPs. Thus, the consultation and engagement process informed the ESIA, in terms of scoping the impact assessment, identifying potential impacts and issues, defining the expectations of the public and stakeholders, and formulating measures to manage adverse and beneficial project impacts.

An initial Public Consultation and Stakeholder Engagement Plan was prepared at initiation of project design and presented in the Contract Work Plan in June 2019. Information on stakeholders was gathered during the ESIA and the records are presented in Appendix B. Subsequently during project design, a more formal Public Consultation and Stakeholder Engagement Plan was developed. This more formal plan also is presented in Appendix B. The appendix details all the activities and the processes required to manage and implement stakeholder engagement going forward.

Similarly, a grievance mechanism was not set up for the ESIA but has been developed as part of the ESIA outcomes and presented in Section 11.4.

The strategy focuses on inclusive engagement to maximize participation of women, men, and members of vulnerable groups<sup>13</sup>, with the following overarching objectives:

- Providing sufficient and accessible information to enable stakeholders, including local communities, to become, at a minimum, informed and educated about the proposed project and its potential impacts, and to build their capacity to participate
- Identifying and discussing issues of concern and suggestions for enhanced benefits
- Facilitating commenting on alternatives
- Contributing local knowledge and experience to impact assessment
- Creating a mechanism of project accountability to stakeholders
- Achieving regulatory and statutory compliance

Details of the public consultation and stakeholder engagement activities for the ESIA are discussed further in Section 4.

In accordance with IFC PS 1, among the objectives of ESIA is:

To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

Information on the project was not disclosed before the ESIA started as the proposals contained restricted information that could not be discussed publicly under Mongolian Law. The public consultation and stakeholder engagement strategy has been implemented throughout the ESIA process, and findings of the ESIA have been disclosed to the public and stakeholders in response

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<sup>13</sup> Vulnerable groups, including women workers, young workers, migrant workers and workers with disabilities (IFC, 2012)

to their concerns and expectations raised during the first public consultations and stakeholder engagements. The purpose of this disclosure is:

- To help the public and stakeholders understand the potential impacts that may arise as a result of the project implementation and the management measures that could be employed in response
- To provide an opportunity for public and stakeholders to raise comments or concerns about the implementation of the project and request additional management measures
- To confirm to the public and stakeholders that their concerns and opinions expressed through the public consultation and stakeholder engagement activities have been considered in project design, and ESIA and ESMP development

### **3.3.4 Environmental and Social Management Plans**

Three ESMPs have been developed, one for each of the wellfield (CP-1), AWPP (CP-2), and raw and finished water conveyance (CP-3) construction contract packages. In addition, an ESMP for high voltage power supply and heat supply (CP-4) will be developed during CP-4 design, which has not yet been contracted at the time of writing, and will be included in a supplemental ESIA expected to be issued in April 2021.

The ESMPs specify the management measures and associated monitoring that are to be implemented during preconstruction, construction, and operation and maintenance. As applicable, the ESMP management measures integrate the results of the public consultation and stakeholder engagement process. As discussed in Section 3.2, the ESIA team eliminated decommissioning from detailed study, because effectively the useful life of the BWSE will not end and the system will not be decommissioned. The management measures and monitoring specified in the ESMPs would be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA.

For each of the subject project phases or the overall ESMP, the ESMPs organize and summarize the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule
- Implementation Budget

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and costs into a workplan, schedule, and budget estimate for implementing the ESMP.

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## 4. Public Consultation and Stakeholder Engagement

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### 4.1 Consultation and Engagement Process

In accordance with the requirements of the IFC Performance Standards (IFC, 2012) and Mongolian regulations on environmental impact assessment (MEGD, 2014), and as part of both the ESIA and the RAP, the ESIA and RAP teams, with MCA-Mongolia, undertook public consultation and stakeholder engagement activities directed through the Stakeholder Engagement Plan. The main purpose of consultation and engagement activities as per IFC requirements are specified in Section 3.3.3. It is important to note that the IFC requirements for public consultation (PC) and stakeholder engagement (SE) are more stringent than Mongolian regulations for PC and SE. In addition to this, the ESIA for the BWSE project is developed based on the IFC and MCC requirements. Thus, PC and SE activities of ESIA are organized based on the IFC requirements.

Public consultation and stakeholder engagement provide opportunities for stakeholders to express their views on the potential risks, opportunities, and impacts generated by the BWSE project and proposed mitigation. Stakeholders comprise a broad range of individuals and communities, including business communities, local residents, and local and national government representatives. This informs the following strategic concerns:

- The consultation process needs to involve women and men, the old and young.
- Indirect and secondary impacts of development can significantly affect people not directly associated with a project.
- In the initial stages consultation should be as wide reaching as possible, involving local organizations or community groups, NGOs, business representatives or trade associations, public representatives, local or national government representatives.
- Some people, often the most vulnerable, have difficulty voicing their concerns. This often includes groups such as those involved in the informal economy, the poor and illiterate.

The consultation and engagement process takes full account of the strategic concerns outlined above, as well as the following key planning tasks:

- Identify all stakeholder groups (typically integrated with social impact assessment)
- Identify the key issues around which consultation will be needed (scoping)
- Ensure that vulnerable and excluded groups are adequately identified and specific efforts made to ensure consultation and unrestrained participation
- Understand the decision making process
- Determine the necessary level of consultation
- Identify key consultation points
- Select consultation techniques (methodology)
- Define a communication method

#### 4.1.1 Consultation and Engagement Objectives

As defined in the IFC, “Stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project’s environmental and social impacts (IFC, 2007). Stakeholder engagement is an ongoing process



that involves the following elements: stakeholder analysis and planning, disclosure and dissemination of information, consultation and participation, grievance mechanism, and ongoing reporting to Affected Communities. The nature, frequency, and level of effort of stakeholder engagement varies considerably and is commensurate with the project's risks and adverse impacts, and the project's phase of development.

Focusing on inclusive engagement to maximize participation of women, men, and members of vulnerable groups, public consultation and stakeholder engagement proceeded with the following overarching objectives:

- Identify stakeholders and map their geographic locations
- Identify the means to communicate information to all stakeholders (with special attention paid to inclusion of vulnerable and often excluded groups), and obtain and exchange information
- Planning the message to be delivered and ways of receiving information
- Provide detailed information on the ESIA and RAP activities and process to the stakeholders
- Foster a comprehensive understanding of the project environmental and social impacts, both positive and negative
- Conduct consultation meetings with stakeholders
- Organize and record public discussions
- Obtain views of stakeholders and seek to address their concerns and reflect their opinions in the project activities
- Enable public participation in the decision-making process

Comprehensive public presentations and a subsequent consultative agreement are an impetus to the project proceeding without, or with less, public conflict and challenges. Basic information provided to stakeholders throughout public consultation and stakeholder engagement has included the following:

- Related legal documents
- Decision issues with respect to the project design
- Information about the potential positive and negative environmental and social impacts and mitigation during the preconstruction, construction, and operation and maintenance phases.

## 4.1.2 Stakeholder Categories

As defined by IFC (2002<sup>14</sup>), stakeholders are “any and all individuals, groups, organizations, and institutions interested in and potentially affected by a project or having the ability to influence a project.” Stakeholders have been considered from the national to the local level, such as the representatives of government organizations and civil society organizations, and individuals who potentially would be affected, directly and indirectly, by project implementation. Stakeholders groups consulted and engaged comprise the following:

### **Representation of Government Organizations**

- MET

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<sup>14</sup> IFC. 2002.

- Municipality of Ulaanbaatar City
- USUG
- Tuul River Basin Authority
- Governor's Office and Citizen's representative council of Songinokhairkhan District
- Governor's Office and Citizen's representative council of Khan-Uul District
- Environmental officers and state inspectors of districts and khoroo
- Environmental and Tourism offices of districts and khoroo
- Citizen's council and Governor of kheseg<sup>15</sup>, etc.

### **Representation of the Civil Society Organizations**

- NGOs operating in environmental field
- NGOs operating in human right issues

### **Citizens of the Respective District and Khoroo**

- Residents
- Herders
- Farmers
- Small and medium-sized enterprises

As feasible and appropriate, included among the residents, herders, farmers, and enterprises contacted, were those who:

- Live near the proposed project components
- Depend on the Tuul River for human or animal consumption or use
- Use private wells that may be affected by BWSE-induced changes to groundwater levels or water quality
- Are served by the USUG water supply system, either through piped water or water kiosks
- Are defined as vulnerable or come from groups usually excluded

Once stakeholder categories were carefully determined as mentioned above, the participants for public consultation and stakeholder engagement activities were identified and recruited by closely working with social workers at each khoroo. Khoroo social workers were able to identify households from vulnerable groups, as defined in Section 6.2.8, from whom to select potential participants. A listing of the stakeholders contacted throughout the ESIA is provided in Appendix B.

## **4.2 Public and Stakeholder Input, Feedback, and Concerns**

### **4.2.1 Health and Safety Measures**

The public consultation and stakeholder engagement activities were planned to start just after census of RAP activities as supervised by MCA-Mongolia. As the Covid-19 outbreak started in

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<sup>15</sup> Ulaanbaatar city is divided into nine districts, which are further subdivided into khorooos (subdistrict) and each khoroo is further divided into khesegs (micro-districts). Khesegs are the smallest administrative units containing no more than few hundred households.



China and the around the world, in late January 2020 Mongolia banned public gatherings and shut its border out of concern that the coronavirus could enter the country. The GoM ban was extended till the end of June, with a gradual and cautious lifting of restrictions between July 1<sup>st</sup> and 15<sup>th</sup>.

The public fears related to the Covid-19 outbreak remains strong, therefore, the number of people who participated in the meeting was limited and participation was not as active as expected.

Health and safety measures during the public consultation and stakeholder engagement were provided according to the World Health Organization (WHO)<sup>16</sup> and GoM's guidelines as well as IFC's Interim Advice<sup>17</sup>. In addition to this, participants were advised to follow standard hygiene and social distancing measures. However, in Mongolia, the real mitigation is managed by the GoM. The GoM will decide travel restriction, stay at home policies, et cetera, depending on current Covid-19 condition. Developing safe and effective Covid-19 public consultation and stakeholder engagement and grievance management is an important part of maintaining a proactive communication process and providing communities with information in a timely manner.

- Asking all meeting attendees screening questions to assess possible exposure to coronavirus
- Announcing and following the health and safety plan of AECOM
- Measuring body temperature of attendees
- Providing masks and hand sanitizer
- 5 people as maximum at the same time
- If there is space, arrange seats so that participants are at least 1 meter apart for ensuring distancing between participants
- Clean venue before each event
- Indoor air ventilation by opening window at least once every 30 minutes
- Duration of public consultation fixed at 1 hour
- If anyone who starts to feel unwell, call National Center for Communicable Disease's Covid -19 hotline- 119.
- Offer the person a mask so they can get home safely, if appropriate, or to a designated assessment facility.

## 4.2.2 Public Consultation and Stakeholder engagement activities

To successfully organize public consultation and stakeholder engagement activities, local community members were selected using random and targeted methodologies according to initial discussion with districts and khoros social workers. The public consultation and stakeholder engagement activities were challenging to organize due to Mongolian Government's ban on public events in Covid-19.

The public consultations and stakeholder engagement activities were organized using following communication tools:

- Face-to-face meetings
- Household Questionnaires
- Focus Group Discussions

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<sup>16</sup> WHO. 2020.

<sup>17</sup> IFC. 2020.

- Key Informant Interviews

Consultations focused on engaging key stakeholders with regards to the BWSE project design, disseminating information on the BWSE project and meeting with directly affected local communities and households. Information on the BWSE project was presented and these meetings were used to determine stakeholders' levels of interest and their opinions on the BWSE project and the safeguard documentation processes. Information on the project has not been widely disseminated before or during ESIA, other than at these meetings, as the project contains restricted material prohibited from dissemination under Mongolian law.

The public consultations were conducted separately involving two levels of stakeholder engagement: the decision makers and local community of the AoI as discussed in Section 1. Table 4-1 and Table 4-2 shows the dates of public consultation and stakeholder engagement activities.

It should be noted that throughout design development there has been ongoing engagement and consultation with regulatory bodies, including MET, TRBA, MCUD, USUG, MoE, and MUB by means of Working Groups, Policy consultation sessions, technical consultation sessions organized by the MCA-Mongolia and the designer. Within the specific context of Public Consultation and Stakeholder Engagement, as planned in the ESIA Methodology, the entities presented in Table 4-2 were engaged, given their specific role in environmental and social matters pertinent to the BWSE project.

**Table 4-1 Summary of Public Consultation at Districts and Khoroots**

District	Level	Date	Summary of discussion
First PC and SE			
Khan-Uul District	District	Dec 27, 2019 and Jan 08, 2020	<div>1. Brief introduction of BWSE Project</div> <div>2. Brief introduction of design work of BWSE Project</div> <div>3. Brief introduction of ongoing works of ESIA and DEIA activities</div> <div>4. Brief introduction of ongoing works of RAP activities</div> <div>5. Questions and Answers</div>
Khan-Uul District	10 <sup>th</sup> Khoroo	May 4, 2020	
Khan-Uul District	12 <sup>th</sup> Khoroo	June 11, 2020	
Khan-Uul District	13 <sup>th</sup> Khoroo	May 6,2020	
Songinokhairkhan District	District	May 22, 2020	
Songinokhairkhan District	20 <sup>th</sup> Khoroo	June 4, 2020	
Songinokhairkhan District	22 <sup>nd</sup> Khoroo	May 22, 2020	
Songinokhairkhan District	32 <sup>nd</sup> Khoroo	May 6, 2020	
Second PC and SE			
Khan-Uul and Songinokhairkhan District	10 <sup>th</sup> , 12 <sup>th</sup> , 13 <sup>th</sup> Khoroo 32 <sup>nd</sup> , 20 <sup>th</sup> Khoroo	Aug 5-21, 2020	<div>1. Brief introduction of main finding of ESIA</div> <div>2. Questions and Answers</div>

**Table 4-2 Summary of Public Consultation for Decision Maker**

Organization	Level	Date	Summary of discussion	
First PC and SE				
Ministry of Environment and Tourism	Decision maker	May 25 <sup>th</sup> , 2020	1. Brief introduction of BWSE Project 2. Brief introduction of design work of BWSE Project 3. Brief introduction of ongoing works of ESIA and DEIA activities 4. Brief introduction of ongoing works of RAP activities 5. Questions and Answers	
Tuul River Basin Authority	Decision maker	May 13 <sup>th</sup> , 2020		
Second PC and SE				

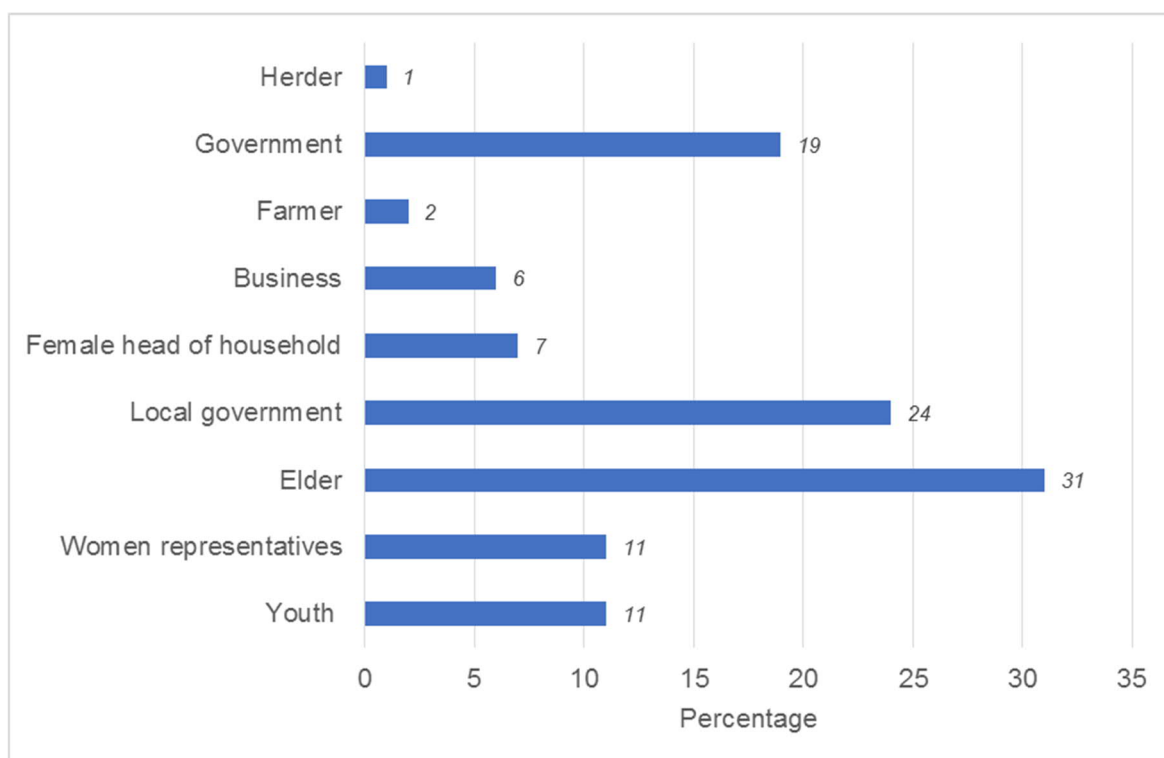
Ministry of Environment and Tourism	Decision maker	Oct 2 <sup>nd</sup> , 2020	1. Brief introduction of main finding of ESIA 2. Questions and Answers
Tuul River Basin Authority	Decision maker	Sep 24 <sup>th</sup> , 2020	
Institutions and NGO			
National Committee on Gender Equality		Oct 3 <sup>rd</sup> , 2020	1. Brief introduction of project 2. Key informant interviews
Human Rights Commission		Oct 4 <sup>th</sup> , 2020	
State Specialized Inspection Agency		Oct 15 <sup>th</sup> , 2020	
Gender Equality Center (NGO)		Oct 11 <sup>th</sup> , 2020	

A total of 232 stakeholders were consulted during these meetings (see Figure 4-1). The stakeholders' group general category is shown in Figure 4-2 and Figure 4-3 shows the breakdown of public consultation participants by sex. All attendance lists for public consultation and stakeholder engagement activities are provided in Appendix B.

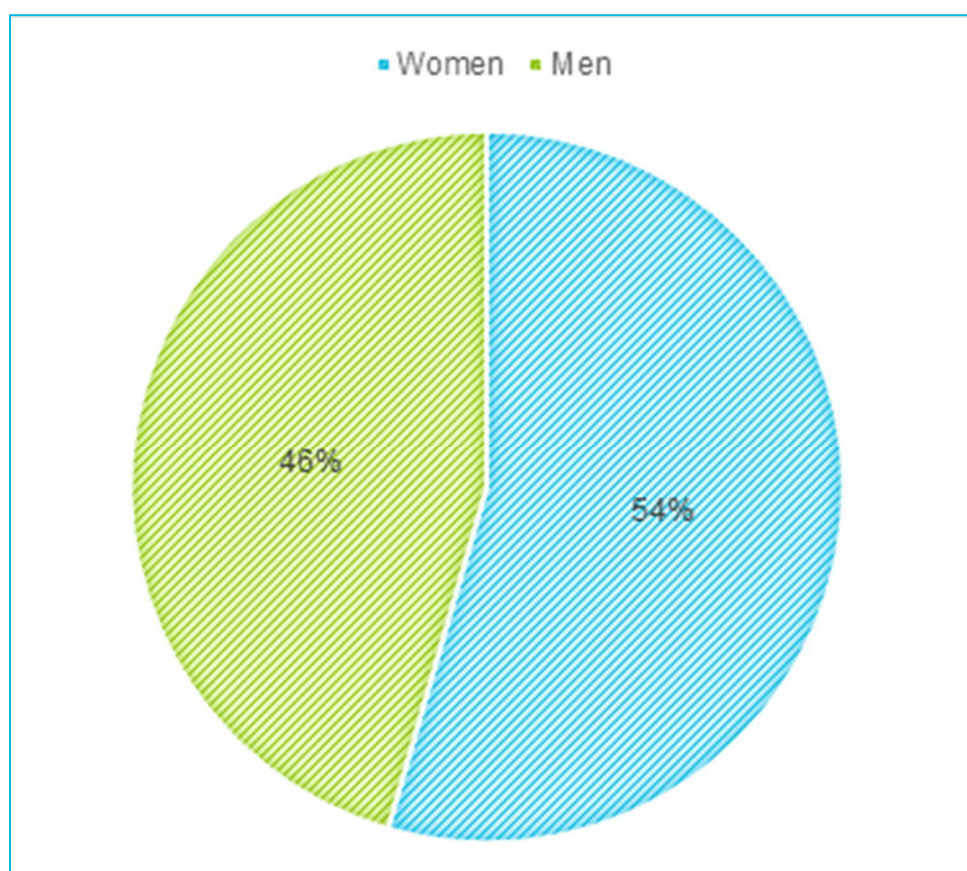


**Figure 4-1 Photos from Public Consultation and Stakeholder Engagement Activities**





**Figure 4-2 Classification of Consulted Stakeholder Categories**



**Figure 4-3 Sex Ratio of Stakeholders Consulted**

## 4.3 Key Findings

This section summarizes the general comments and suggestions received from stakeholders during the public consultation and stakeholder engagement processes. The local government and community public consultation and stakeholder engagement included men and women – ranging in age, education and nature of employment. The feedback received has been divided into that from:

- Comments and concerns received from face to face meetings with national government - Ministry of Environment and Tourism and Tuul River Basin Authority
- Public consultation and household questionnaire survey from local government and local community of:
  - Khan-Uul district's 10<sup>th</sup>, 12<sup>th</sup>, and 13<sup>th</sup> khorooos
  - Songinokhairkhan district's 20<sup>th</sup>, 22<sup>nd</sup>, and 32<sup>nd</sup> khorooos
- Focus Group Discussions' feedback from local government and local community of:
  - Khan-Uul district's 10<sup>th</sup> and 13<sup>th</sup> khorooos
  - Songinokhairkhan district's 20<sup>th</sup> and 32<sup>nd</sup> khorooos
- Key Informant Interviews from local government and local community of:
  - Khan-Uul district's 10<sup>th</sup>, 12<sup>th</sup>, and 13<sup>th</sup> khorooos
  - Songinokhairkhan district's 20<sup>th</sup>, 22<sup>nd</sup>, and 32<sup>nd</sup> khorooos.

The key concerns and expectations raised by local stakeholders in Khan- Uul district were greatly influenced by the environmental impacts of the gravel mining activities (open pit) operating at the 13<sup>th</sup> khoroo of Khan-Uul district, and issues of bad odor and current contamination level of the Tuul river due to CWWTP effluent discharge.

The current key concerns and expectations from BWSE project raised by local stakeholders in Songinokhairkhan district were greatly influenced by the environmental impacts of the cremation facility located in the 20<sup>th</sup> khoroo.

The key stakeholders' feedbacks, concerns and expectations are summarized in Table 4-3.

**Table 4-3 Summary of Stakeholders' Concerns and Expectations**

Category	Stakeholder comment
<b>Key concerns</b>	
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Odor from CWWTP (mostly in Khan-Uul district)</li> <li>• Open pit gravel mining (Khan-Uul district)</li> <li>• Noise</li> <li>• Soil pollution</li> <li>• Water pollution</li> <li>• Air pollution</li> <li>• Air Pollution from cremation facility (Songinokhairkhan district)</li> <li>• Lack of fresh water</li> <li>• Quality of drinking water</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>• Unemployment</li> <li>• Poverty</li> <li>• High interest rates of loans</li> <li>• Loans</li> <li>• Lack of financial support</li> <li>• Alcoholism</li> <li>• Infrastructure</li> <li>• Poor quality of medical services</li> </ul>

Category	Stakeholder comment
<b>Social</b>	<ul style="list-style-type: none"> <li>• Unemployment</li> <li>• Access to state services</li> <li>• Alcoholism</li> <li>• Domestic violence*</li> <li>• Distance of schools</li> <li>• Unemployment</li> <li>• Lack of medical services</li> <li>• Child labor</li> <li>• Female head households</li> <li>• Livestock</li> </ul>
<b>Key expectations</b>	
	<ul style="list-style-type: none"> <li>• Employment</li> <li>• Quality of fresh drinking</li> <li>• Access to fresh drinking water</li> <li>• Water for livestock</li> <li>• Reduction of water pollution</li> <li>• Closure of open pit mining</li> <li>• Water purification</li> <li>• Local investment</li> <li>• Provision of local services</li> </ul>

\*The concerns listed above are general areas of social concern raised by the public and local stakeholders, not particularly focused on this project's impact in the deprived and marginalized areas of the affected districts and khoroos.

**Table 4-4 Summary of Regulatory Stakeholders' Concerns and Expectations**

Organization	Stakeholder comment
<b>Ministry of Environment and Tourism</b>	<p>The MET had questions on how ESIA is including all scopes of the three contract packages and if all processes proposed in the contract packages are covered in ESIA. Concerns were also raised about the feasibility study for AWPP, the project implementer and who is developing the ESMPs.</p> <p>The project team provided all related information and responded to their questions.</p>
<b>Tuul River Basin Authority (TRBA)</b>	<p>TRBA raised concerns on the solutions for health and safety impact mitigation and analysis of contaminated Tuul River sediment.</p> <p>The project team has introduced all related information and responded to their questions accordingly.</p>

### 4.3.1 Summary of Responses to the Household Questionnaire

The quantitative data presented below are from a socio-economic baseline survey taken in 2020 by AECOM and BGM from the affected communities, with a sample of 159 households (covering 567 individuals) selected for the survey using a purposive sampling method. A purposive sample is a non-probability sample that is selected based on characteristics of the population and the objective of the study. The main objective of a purposive sample is to produce a sample that can be logically assumed to be representative of the population.

Due to COVID-19 pandemic restriction only households from the project area that agreed to participate in an interview are selected for the survey. The sample size was determined based on budget and time restriction.

Out of the 159 local community households, representative of Khan-Uul and Songinokhairkhan districts' six khoroos, 57 households are female headed and 102 are male headed, ranging in age, education and nature of employment.

The difference in opinion, suggestion and concerns disaggregated by gender is shown in below Tables.

**Table 4-5 Summary of the Concerns**

	Odor pollution	Air pollution	Soil pollution	Waste	Water pollution	Other*	Total
<b>Number of respondents</b>							
<b>Male</b>	24	16	10	3	17	13	83
<b>Female</b>	19	11	11	2	8	6	57
<b>Total</b>	43	27	21	5	25	19	140
<b>Shares by sex (%)</b>							
<b>Male</b>	55.8	59.3	47.6	60.0	68.0	68.4	59.3
<b>Female</b>	44.2	40.7	52.4	40.0	32.0	31.6	40.7
<b>Total</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Shares by problem (%)</b>							
<b>Male</b>	28.9	19.3	12.0	3.6	20.5	15.7	100.0
<b>Female</b>	33.3	19.3	19.3	3.5	14.0	10.5	100.0
<b>Total</b>	30.7	19.3	15.0	3.6	17.9	13.6	100.0
<i>*Gravel mining activities, pastureland degradation, soil degradation</i>							

**Table 4-6 Summary of the Concerns**

	Poverty/ unemployment	High interest rate	Poor social service/Price of goods	Other*	Total
<b>Number of respondents</b>					
<b>Male</b>	3	1	0	3	7
<b>Female</b>	0	0	1	4	5
<b>Total</b>	3	1	1	7	12
<b>Shares by sex (%)</b>					
<b>Male</b>	100.0	100.0	0.0	42.9	58.3
<b>Female</b>	0.0	0.0	100.0	57.1	41.7
<b>Total</b>	100.0	100.0	100.0	100.0	100.0
<b>Shares by problem (%)</b>					
<b>Male</b>	42.9	14.3	0.0	42.9	100.0
<b>Female</b>	0.0	0.0	20.0	80.0	100.0
<b>Total</b>	25.0	8.3	8.3	58.3	100.0
<i>*Lacking public transportation, high prices, poor living conditions</i>					

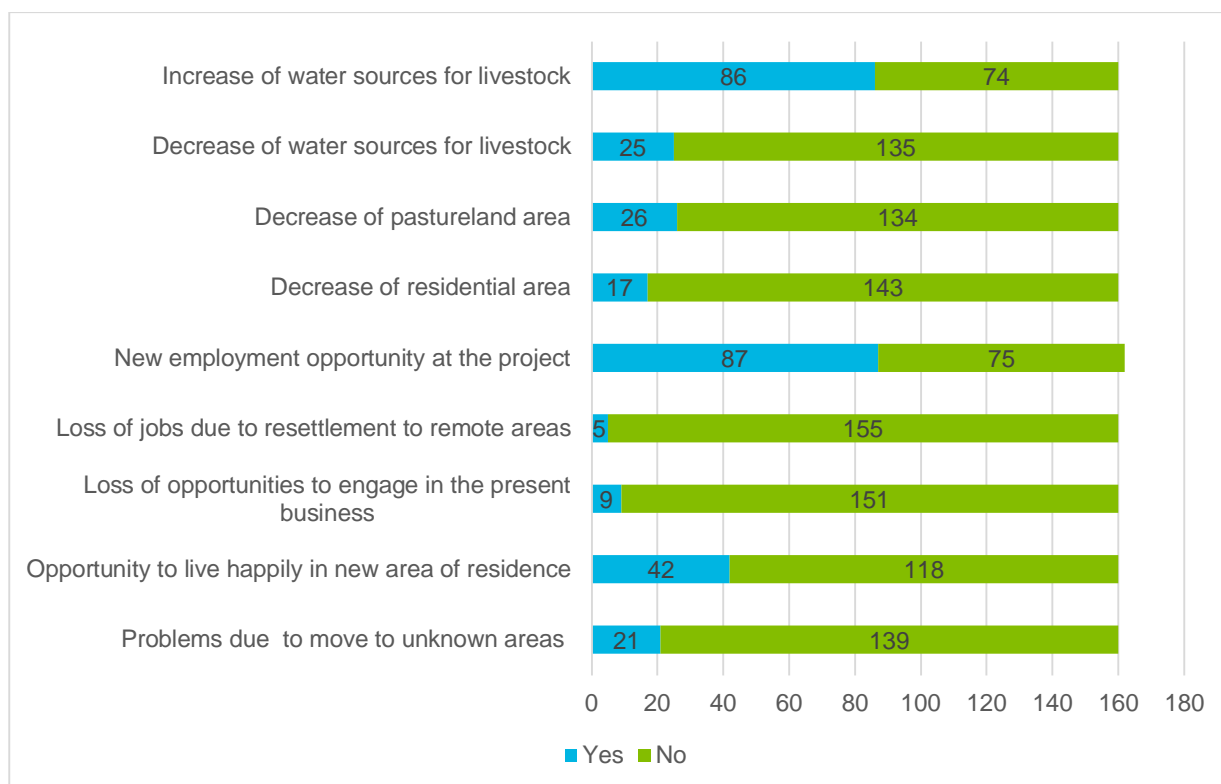
**Table 4-7 Summary of the Concerns**

	Alcoholism /unemployment	Public service	Infrastructure	Other*	Total
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Number of respondents					
Male	17	3	6	9	35
Female	7	5	5	8	25
<b>Total</b>	24	8	11	17	60
Shares by sex (%)					
Male	70.8	37.5	54.5	52.9	58.3
Female	29.2	62.5	45.5	47.1	41.7
<b>Total</b>	100.0	100.0	100.0	100.0	100.0
Shares by problem (%)					
Male	48.6	8.6	17.1	25.7	100.0
Female	28.0	20.0	20.0	32.0	100.0
<b>Total</b>	40.0	13.3	18.3	28.3	100.0
<b>*Lacking greener areas, long distances from public services</b>					

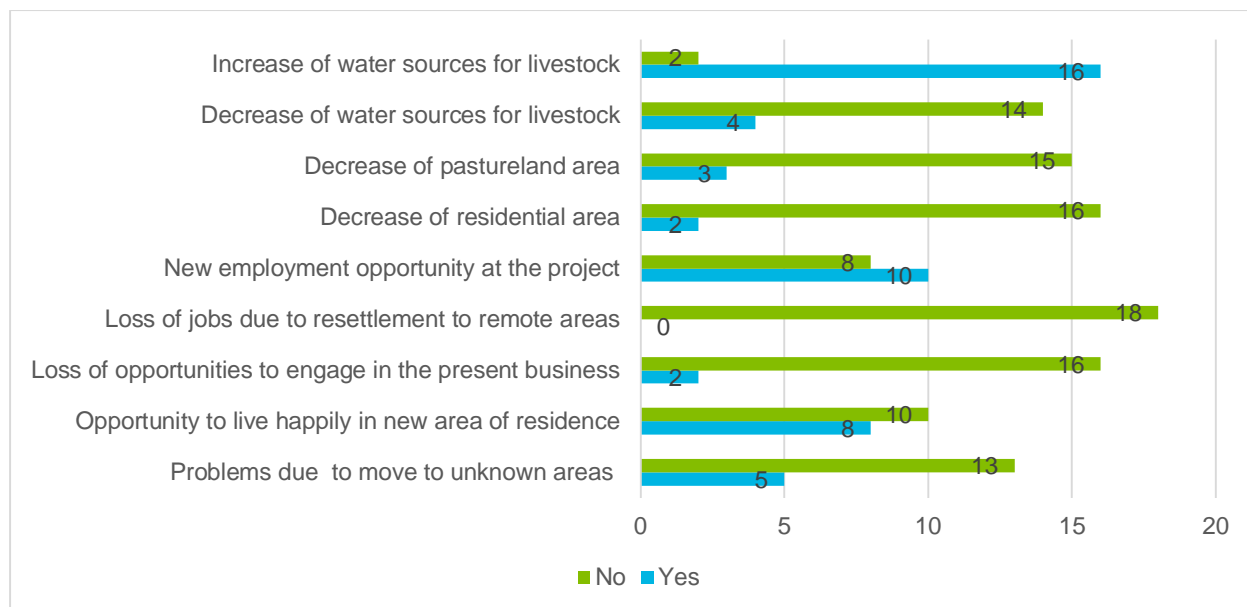
A summary of their responses is shown in Figure 4-4. In general, out of total respondents 86 or 52 percent answered that they expect an increase of water for livestock, 135 or 85 percent answered that they expect no impact water quantity for livestock, 134 or 84 percent expect no impact for pastureland for livestock, 143 or 90 percent believe that there will be no impact on their living, 87 or 49 percent expect employment from the project, 155 or 97 percent do not think that they will be unemployed due to move from place of residence, 151 or 91 percent think there will be no impact on their current business, 118 or 71 percent do not see it as an opportunity to live in new area, 139 or 83 percent don't consider that there will be problems to move from the area.



**Figure 4-4 Summary of responses to questions**

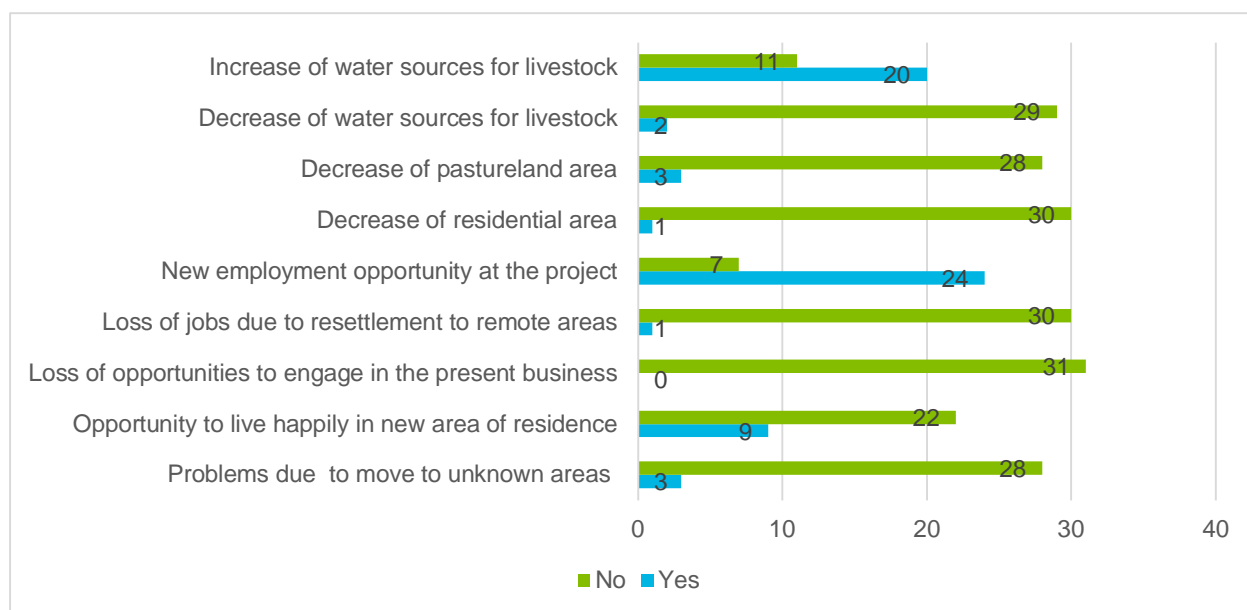
Figure 4-5, Figure 4-6, Figure 4-7, Figure 4-8, Figure 4-9 and Figure 4-10 show the questionnaire responses separated by district and khoroo (in total two districts and six khoroo) in the Aol.

Almost all of Khan-Uul district's 12<sup>th</sup> khoroo respondents expect increase of water for livestock, while majority expects that there will not be any impact on water quantity for livestock. All respondents answered they think there will be some impact on their current business. While almost 50 percent answered they hope there will be creation of new jobs for locals during the project development.



**Figure 4-5 Summary of responses to questions from 12<sup>th</sup> Khoroo of Khan-Uul District**

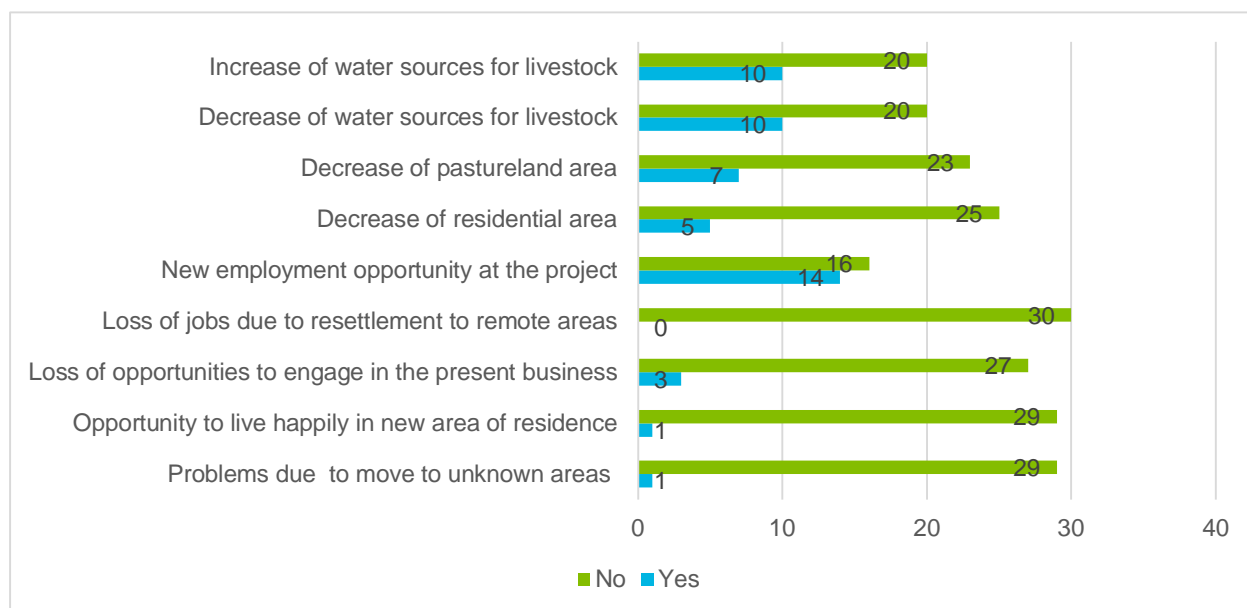
As for Khan-Uul's 10<sup>th</sup> khoroo respondents, only half thinks that water will be more available for livestock, while majority doesn't expect water shortage for livestock. More than 70 percent of respondents do not see the project as good opportunity to settle in new area.



**Figure 4-6 Summary of responses to questions from 10<sup>th</sup> Khoroo of Khan-Uul District**

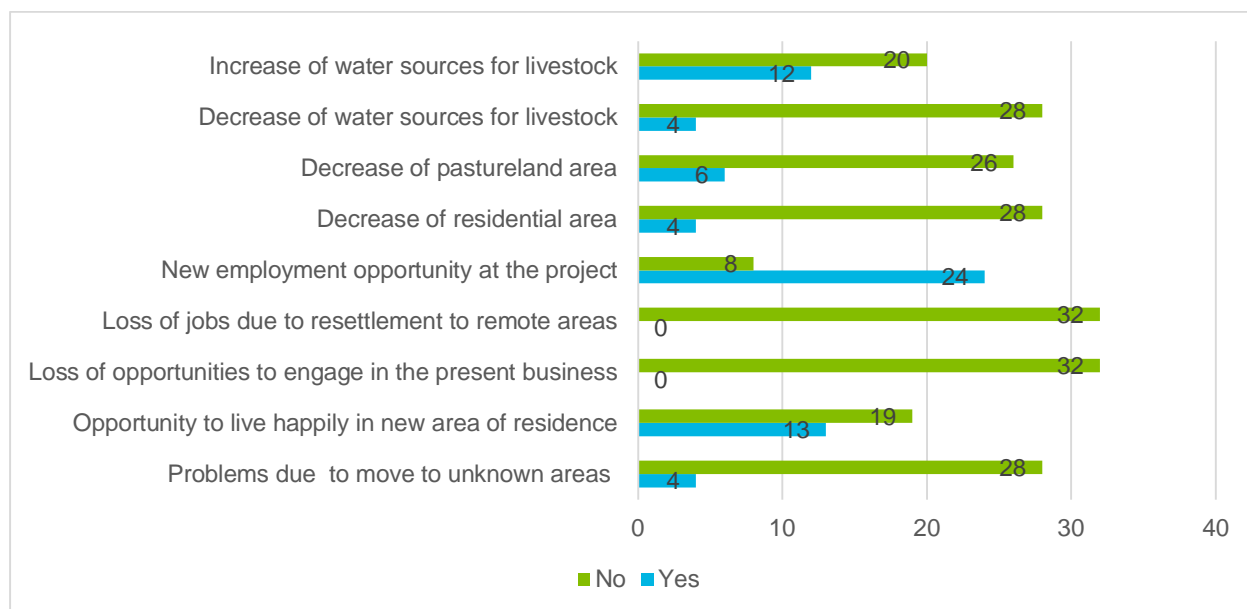
Similarly, 50 percent of Khan-Uul's 13<sup>th</sup> khoroo respondents answered that they expect more water for livestock, the other half thinks water will be less available for livestock. All respondents

answered that there will no impact on their current employment/business and that there will be any complications to resettle.



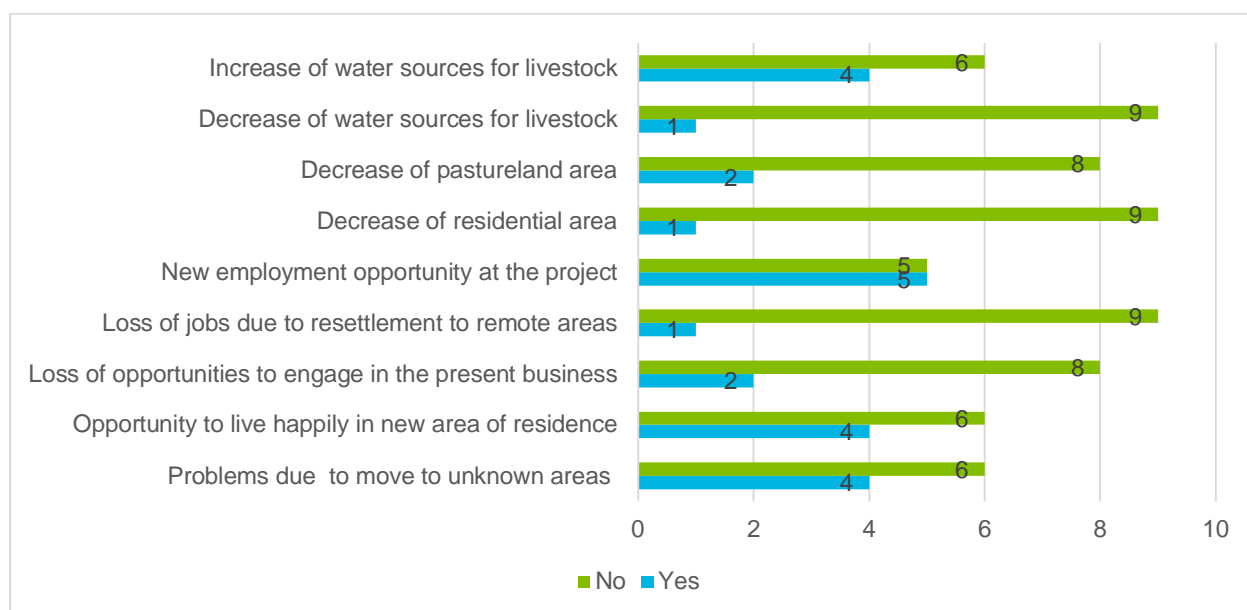
**Figure 4-7 Summary of responses to questions from 13<sup>th</sup> Khoroo of Khan-Uul District**

All of Songinokhairkhan's 32<sup>nd</sup> khoroo respondents view that they will continue their current jobs while almost 70 percent or 24 out of 32 respondents hope for new jobs during project implementation. More than half of surveyed hopes more water will be available for livestock while majority views there will be no shortage of water for livestock.



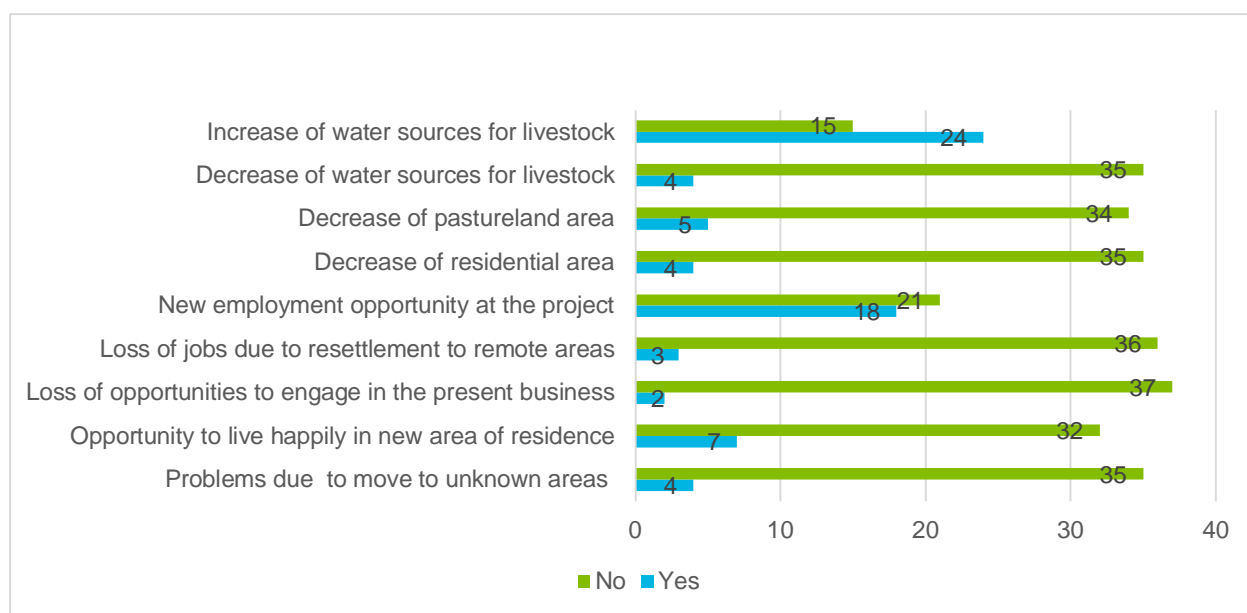
**Figure 4-8 Summary of responses to questions from 32<sup>nd</sup> Khoroo of Songinokhairkhan**

9 out of 10 respondents in Songinokhairkhan's 22<sup>nd</sup> khoroo view there will be no impact on water resources for livestock while only half of respondents hopes for new jobs at the project.



**Figure 4-9 Summary of responses to questions from 22<sup>nd</sup> Khoroo of Songinokhairkhan**

Most respondents (37 out of 39) in Songinokhairkhan's 20<sup>th</sup> khoroo do not think that the project will affect continuation of businesses and 35 out of 39 views that there will be no impact on their current living situation (land).



**Figure 4-10 Summary of responses to questions from 20<sup>th</sup> Khoroo of Songinokhairkhan**

### 4.3.2 Summary of Focus Group Discussions

In total twenty three focus group discussions, each involving 5 to 8 people, were conducted with local government, local community and local business owners to explore their views on a variety of issues with particular emphasis on local perceptions and concerns: living conditions, environment and health, migration, crime, cultural heritage, local governance, businesses, income generation, and education. Focus group categories are shown in Figure 4-11.

Fifteen focus group discussions were organized in Khan-Uul's 10<sup>th</sup> and 13<sup>th</sup> khoros and eight in Songinokhairkhan's 20<sup>th</sup> and 32<sup>nd</sup> khoros. The focus group discussions were held separately for

local government, local community, and business owners to obtain specific information about each category's needs and concerns and ensure representation by a diversity of community members, with particular reference to inclusion of vulnerable groups, including female headed households and the elderly.

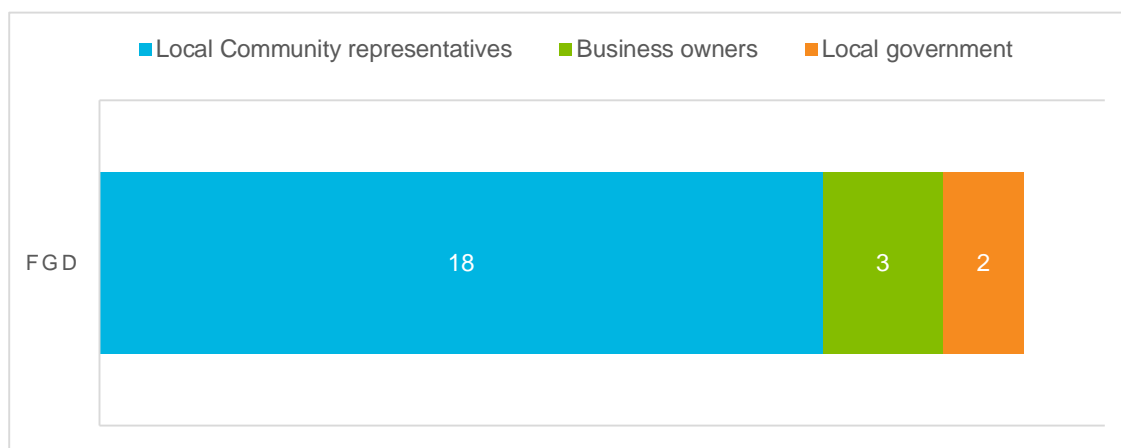


Figure 4-11 Focus Group Discussions Categories

#### 4.3.2.1 Summary of Focus Group Discussions in Khan-Uul District

A total of fifteen focus group discussions were organized in Khan-Uul's 10<sup>th</sup> and 13<sup>th</sup> khoroo. In the 10<sup>th</sup> khoroo, four focus group discussions were held with the local community involving 16 people (12 women, 4 men), two were with business owners (1 woman, 1 man) and one was with local government, involving 5 people. In the 13<sup>th</sup> khoroo seven focus group discussions were held with local community involving 26 people (21 women, 5 men) and one was with a business owner (a woman).

The focus group discussions at Khan-Uul district revealed key environmental concerns such as air pollution and dust, mainly due to gravel mining activities and the CWWTP, and poor water quality due to soil contamination and pollution of the Tuul River. Most participants expressed concerns related to livelihood opportunities and reduction of the groundwater resources when the project starts. Poor quality of water was the main concern voiced at most focus group discussions. While the focus group discussion in the 13<sup>th</sup> khoroo, for example, pointed to the need for closure of gravel mining in the area. The focus group participants emphasized that ongoing engagement and transparent communication with the local community about the project activities is crucial.

Most participants of the focus group discussions recognized the opportunity for new jobs and supply of fresh drinking water.

Table 4-8 Summary of Focus Group Discussions in Khan-Uul District

Focus group discussion	
Key questions	Stakeholder comments
What kind of business activities do you have in your area?	<p>A large number of business entities operating in agricultural field such as livestock breeding, vegetable farming and poultry farms. There are more than 20 poultry farms, and about 70 entities including gravel mining and a glue factory (13<sup>th</sup> khoroo)</p> <p>Small sized businesses such as car washing, hairdressing, sewing at home; small convenience /grocery stores; renting apartments and stalls at local markets (10<sup>th</sup>, 12<sup>th</sup> khoroo)</p>

Focus group discussion	
<b>What is the discrimination and crime rate in your area?</b>	<p>The crime rate is relatively low. Crimes such as theft of car parts, livestock theft, brawls due to excessive alcohol consumption are most common.</p> <p>The discrimination rate is low, but there are cases of discrimination towards poorer families and internal migrants from the countryside.</p>
<b>What will be the positive and negative impacts of the project on the livelihood and health of local people?</b>	<p><b>Positive impacts include:</b></p> <ul style="list-style-type: none"> <li>• Creation of new jobs during the construction and operational phases.</li> <li>• Development of small and medium enterprises, local supply.</li> <li>• Improved local economic capacity.</li> <li>• Elimination of the bad odor from the CWWTP.</li> <li>• Access to and supply of fresh drinking water to locals.</li> </ul> <p><b>Negative impacts include:</b></p> <ul style="list-style-type: none"> <li>• A large number of gravel mining entities cause a number of problems to households and people living close to these sites. The khoroo has low population density and fertile soil so business is likely to expand if access to clean water is provided. Which leads to increased migration.</li> <li>• Movement of big trucks on highways during the construction phase may cause traffic accidents and road damage.</li> <li>• Earthworks, soil stripping, equipment handling and storage, transportation may result in dust and air pollution during the construction phase.</li> <li>• Operation of heavy machinery and equipment, and construction work may cause moderate negative impacts.</li> <li>• Negative impacts on health of local community may occur, for instance, the treatment plant may discharge heavy metals and toxics waste into the Tuul River that may affect the health of locals.</li> <li>• Accidents involving children due to construction works may occur, so preventive measures should be taken, and parents should be informed so they personally take their children to school and back.</li> <li>• Negative impacts also depend on measures the government takes to support the population to be resettled.</li> <li>• Households near Shuvuun Fabrik and Biokombinat have livestock, so the construction work may negatively affect pastureland where livestock grazes.</li> <li>• The Morin Hill area does not have households with livestock. But, livestock grazes along the riverbanks behind the Morin hill in winter and summer. Therefore, it is important to prevent livestock from falling into pits during the construction phase.</li> <li>• In summertime children play near the area of planned construction of pipelines, so signs and boards should be placed to prohibit entry to any dangerous area during the construction works.</li> <li>• In summertime people often go to the Tuul River to spend leisure time along the riverbanks. Also motorcycle and automobile off-road race is organized in that area. The project needs to consider this issue.</li> <li>• There is a possibility of new crime at the construction site and surroundings.</li> </ul>
<b>Will the project change the value of land in your area?</b>	<ul style="list-style-type: none"> <li>• The value and price of the land may rise because of positive impact of the project such as restoration of soil and supply of fresh water;</li> <li>• The western area is likely to develop more as the agriculture is developing at Shuvuun Fabrik and Biokombinat area, so the value may rise;</li> <li>• There is still an issue of contaminated soil due to pit latrines in each yard. They pollute soil and further penetrate water resources. Hopefully the infrastructure development will bring more eco-friendly latrines.</li> </ul>
<b>Where do you get drinking water from? What are the water related issues?</b>	<ul style="list-style-type: none"> <li>• Households in apartments get water from the integrated water supply system. Other residents living in ger districts take water from public water wells/ kiosks. These wells are located at a large distance from the households. Very few households have private wells.</li> </ul>

Focus group discussion	
	<ul style="list-style-type: none"> <li>The quality of water from public wells does not meet drinking water standards. Not all households can afford to buy bottled drinking water.</li> </ul> <p><b>Water related issues:</b></p> <ul style="list-style-type: none"> <li>Water quality from the public wells/ kiosks is not good, so it is necessary to provide clean water to the residents in this area.</li> <li>Water looks muddy when boiled.</li> <li>Tuul River contamination is bad, locals cannot swim. It is expected that with the project implementation the contamination will decrease.</li> </ul>
<b>Are there any water-related diseases?</b>	<ul style="list-style-type: none"> <li>The drinking water quality is bad; it does not meet the standards; therefore, it affects the health of locals. However, there is no valid evidence.</li> <li>Children who swim in Tuul River during summertime get rashes and allergies.</li> </ul>
<b>What is the gender situation in your area?</b>	The gender-based discrimination and violence is relatively low. There were few cases of domestic violence towards women by drunken spouses.
<b>Why is migration higher in your area? Do you think the project will affect migration?</b>	<p>Migration and movement is relatively different depending on the khoroo's location. The migration rate was high during the new airport construction.</p> <p>It is important that the earthworks planned by the project would not affect household yards and houses. It is difficult for families to move and resettle. Therefore, it would be better to organize the construction work without any impacts on private land.</p> <p>The pipelines are projected to be installed in the areas behind the households in Morin hill without disturbing residents' fences and land. Therefore, there would be less resettlement and land acquisition.</p>
<b>What will be the positive and negative impact of the project on the activities of local schools and kindergartens?</b>	<p>The school of Morin Hill is located in the north of the central road, therefore students of this school may be affected. The school is located along the main road so road signs should be placed. Movement of big trucks and machinery generate dust and air pollution which may affect children's health when they go to schools.</p> <p>Also, movement of big trucks and machinery on the bridge during the construction phase may cause further deterioration of the bridge. Children cross this bridge on their way to school and kindergarten. It is necessary to repair the bridge and install speed bumps at the roads.</p>
<b>Are there any natural monuments, remains or historical buildings etc. in your area?</b>	There are some but they are located far from the project site.
<b>Do you have anything to add or suggest?</b>	<ul style="list-style-type: none"> <li>Consider delivery of water supply to ger areas in the future. Locals need a reliable source of drinking water. Some people misunderstood that the project will supply fresh water to the locals.</li> <li>Hopefully this project will benefit the locals.</li> <li>The project is effective and useful in the long run.</li> <li>Hopefully the government will take actions for promoting infrastructure development at this suburban area.</li> <li>Immediate implementation of the project is needed.</li> <li>5 years seems a very long term for project implementation. Hopefully it can be executed in a shorter time.</li> <li>Eventually, this project would have positive impacts for all citizens of Ulaanbaatar city.</li> <li>There is a fiber optic cable route along this road that the project needs to consider.</li> </ul>



Focus group discussion	
	<ul style="list-style-type: none"> <li>Project implementers should consider concerns and feedback of the locals and try to implement their requests. Otherwise, conflicts may rise between the contractors and locals.</li> </ul>

#### 4.3.2.2 Summary of Focus Group Discussion in Songinokhairkhan District

A total of eight focus group discussions were organized in Songinokhairkhan's 20<sup>th</sup> and 32<sup>nd</sup> khoroots. In the 20<sup>th</sup> khoroot three focus group discussions were organized with local community involving 19 people (12 women, 7 men), one with local government involving 8 people (5 women, 3 men). In the 32<sup>nd</sup> Khoroot four focus group discussions were held with local community involving 25 people (18 women, 7 men). Participants into Focus Group Discussions (FGDs) were selected from different socioeconomic groups for better representation. There were more women participants than men in FGDs but participants in the key informant interviews were mostly men as were individuals in government position or with a higher social status. Women participation in the FGD allowed gathering female perspectives to balance views regarding the projects. The engagement included not only poor or vulnerable groups of the PAP, but it included participants from all socio-economic classes, as a result, concerns and issues are covered from different socio-economic groups. Participants were volunteers willing to take part, identified by the district social worker in collaboration with the ESIA Survey team.

The majority of participants stressed environmental issues such as air pollution and bad odor from the cremation facility and CWWPT, poor quality of drinking water. The focus group participants agreed that they do not see major impacts since the pipelines only affects the 8<sup>th</sup> kheseg<sup>18</sup> of the 20<sup>th</sup> khoroot and does not impact for other areas much. Some participants expressed concerns that traffic accidents and crimes may increase due to movement of big trucks on the roads and migration of alien workforce during the construction phase of the project. Similar to Khan-Uul district, most of the participants expressed hopes of new employment opportunities for locals, improvement of livelihood, increase of the value of land where they reside and access to fresh drinking water.

The main findings from data generated by the focus group discussions are summarized below.

**Table 4-9 Summary of Focus Group Discussions in Songinokhairkhan District**

Focus group discussion	
Key questions	Stakeholder comments
<b>What kind of business activities do you have in your area?</b>	<ul style="list-style-type: none"> <li>Meat processing, plastic production, vacuum insulated glass windows factories operate in the area.</li> <li>Food processing Khuns Trade, oil station,</li> <li>Small sized businesses: car repair services, carpentry workshops, small convenience /grocery stores ;</li> </ul>
<b>What are the major issues in your area?</b>	<ul style="list-style-type: none"> <li>Air pollution, bad odor due to cremation facility which started operations in 2004</li> <li>Bad odor from CWWTP</li> </ul>

<sup>18</sup> Ulaanbaatar city is divided into nine Districts, which are further subdivided into khoroots (subdistrict) and each khoroot is further divided into khesegs (micro- districts). Khesegs are the smallest administrative units containing no more than few hundred households.



Focus group discussion	
	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Solid urban waste</li> <li>• Poor street lighting</li> <li>• Very poor water quality</li> <li>• High migration rate</li> <li>• Dust from the roads built near the residential area</li> <li>• Movement of big truck traffic all day and night on the road</li> <li>• Unemployment</li> <li>• Poverty</li> <li>• Underdeveloped service sector, lack of banks, pharmacies, bathhouses;</li> <li>• Shortage of schools, kindergartens</li> <li>• Shortage of power/electricity</li> </ul>
<b>How is discrimination and crime rate in your area</b>	<p>Crimes such as theft, robbery, domestic violence, brawls due to excessive alcohol consumption are most common.</p> <p>The discrimination rate is low, there is intensive internal migration from western aimags, cases of discrimination towards the poorer families and migrants from the countryside.</p>
<b>What will be the positive and negative impact of the project on the livelihood and health of the local people?</b>	<p><b>Positive impacts include:</b></p> <ul style="list-style-type: none"> <li>• Creation of new jobs during the construction and operational phases for youth</li> <li>• Development of small and medium enterprises, local supply</li> <li>• Improved local economic capacity</li> <li>• Elimination of the odor from the CWWTP</li> <li>• Access to fresh drinking water and supply of fresh drinking water to locals</li> <li>• Increase of business' income</li> <li>• Increase of purchasing power</li> <li>• Since construction affects only the 8<sup>th</sup> Kheseg of the 20<sup>th</sup> Khoroo area, there is not much impact for other areas.</li> </ul> <p><b>Negative impacts include:</b></p> <ul style="list-style-type: none"> <li>• The pipelines will be installed at the 8<sup>th</sup> Kheseg industrial area where businesses and factories are located, so the entry and exit areas might be closed for a certain time which may present a problem for businesses.</li> <li>• Movement of big trucks on highways during the construction phase may cause traffic accidents and road damage.</li> <li>• Earthworks, soil stripping, equipment handling and storage, transportation may result in dust and air pollution during the construction phase.</li> <li>• Operation of heavy machinery and equipment and construction work may cause moderate negative impacts.</li> <li>• As the area where the plant will be built is heavily polluted, the treatment capacity of the plant is crucial so it can operate sustainably for the next generations</li> <li>• Crimes may occur at the construction site and surroundings.</li> </ul>
<b>Will the project change the value of land in your area?</b>	<ul style="list-style-type: none"> <li>• The value and price of the land will increase due to supply of fresh water;</li> </ul>

Focus group discussion	
	<ul style="list-style-type: none"> <li>The value of the area where the pipelines are installed might increase, e.g. from 35 million to 40 million Mongolian tögrög (MNT)</li> <li>10 years ago 1 hectare of land was sold for 1 million MNT, now it is 30 million MNT for 0,14 hectares</li> <li>Developing new residential areas with fresh drinking water supply will affect land value</li> <li>The price of the land may increase in the far future since at present the local water is not planned to be purified. If the water pipelines can be installed for locals then the price might go up.</li> </ul>
<b>Where do you get drinking water from? What are the water related issues?</b>	<ul style="list-style-type: none"> <li>Households who reside in apartments get water from integrated water supply system. Some apartments are relatively old (built in the 1960s) so the integrated water supply system is not of good quality, it has bad odor and rust so residents mostly purchase bottled drinking water. Those who live in new apartments have a relatively good quality water.</li> <li>Other residents living in ger districts take water from public water wells/ kiosks. The location of these wells is quite remote 2-3 km from their households.</li> <li>Few households have private wells in their yards.</li> <li>-Some residents get their water from very old wells. Water seems to be polluted.</li> <li>Some residents get their drinking water from wells located at a distance of less than 1 km from pit latrines and livestock grazing areas. Water seems to be polluted.</li> <li>Some public wells open only during certain hours, e.g., 9-10 am or twice a day, so the water supply is not enough.</li> <li>Price for water is 5 MNT per liter, which seems very high.</li> <li>The quality of water from these wells does not meet drinking water standards.</li> </ul> <p><b>Water related issues:</b></p> <ul style="list-style-type: none"> <li>Water quality from the public wells/ kiosks is not good, so it is necessary to provide clean water to the residents in this area.</li> <li>Water in Bordoo area is high in sodium,</li> <li>Water is hard, muddy, it leaves white stains when boiled.</li> </ul>
<b>Are there any water-related diseases?</b>	<ul style="list-style-type: none"> <li>Water quality is very bad, but there aren't any cases of water related diseases that we know of.</li> <li>Drinking water quality is bad; it does not meet the standards; therefore, it affects the health of locals. However, there is no valid evidence.</li> </ul>
<b>What is the gender situation in your area?</b>	The number of cases of gender-based discrimination and violence is relatively low. Domestic violence is generally due to alcoholism.
<b>Why is migration higher in your area? Do you think the project will affect migration?</b>	<ul style="list-style-type: none"> <li>The migration and movement rate is relatively different depending on the khoroo's location.</li> <li>Since city development is planned in the western area the migration rate will increase. The number of migrants increases every year.</li> <li>If the cremation facility is moved migration might increase even more.</li> </ul>

Focus group discussion	
	<ul style="list-style-type: none"> <li>• Migration will increase since a new school, a new health facility, and a new residential area are being built in addition to the fresh water supply.</li> </ul>
<b>What will be the positive and negative impact of the project on the activities of local schools and kindergartens?</b>	The schools are located far from the planned construction so no major impacts except possible closure of some roads on the way to schools. In this case new temporary roads or tunnels should be built.
<b>Are there any natural monuments, remains or historical buildings etc. in your area?</b>	There is a Monument for repressed in the area near the AWPP site where annual events and festivities take place.
<b>Do you have anything to add or suggest?</b>	<ul style="list-style-type: none"> <li>• Consider delivery of water supply to ger areas in the future. Locals need reliable source of drinking water. Some people misunderstood that the project will supply water to the locals.</li> <li>• Reclamation of the site should be done after the construction</li> <li>• 20 households are residing in the area where the pipelines will be installed so sufficient information about the project should be provided and constant communication with them should be maintained.</li> <li>• Consider employment of the locals during the project implementation</li> <li>• Consider the road traffic during the Naadam</li> <li>• Eventually, this project would have positive impacts for all citizens of Ulaanbaatar city.</li> <li>• Consider elimination of the bad odor from CWWTP.</li> <li>• The project should be implemented immediately, as it is beneficial for locals and the UB city, the project should not be abandoned.</li> <li>• Water is an essential need, Tuul river contamination is bad, power stations and households should use treated water for their needs in order to reduce pollution.</li> </ul>

### 4.3.3 Summary of Key Informant Interviews

Key informant interviews were organized with local government staff (social workers, health workers), educational staff (teachers and school social workers), and law enforcement representatives at both Khan-Uul and Songinokhairkhan districts. The purpose of the key informant interviews was to get qualitative, in-depth knowledge of the local environmental and health issues, governance, and demography, as well as to hear concerns and recommendations for the BWSE project.

#### 4.3.3.1 Summary of Key Informant Interviews in Khan- Uul District

Key informant interviews in Khan-Uul district were conducted on February 18<sup>th</sup>, 2020 at the 10<sup>th</sup> khoroo, February 14<sup>th</sup>, 2020 at the 12<sup>th</sup> khoroo, and on February 6<sup>th</sup>, 2020 at the 13<sup>th</sup> khoroo.

##### **1. Summary of interviews with local government staff (social worker)**

*When asked about migration in the area the most frequent answers were:*

- At present the migration rate is relatively low since there is ban on land acquisition in the Morin Hill area. Migration may increase when land becomes available.

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*"I hope there will be employment opportunities during the construction phase. It would be beneficial if our khoroo residents would get jobs during this phase. There are many locals to work at the site, the project does not need workers from afar."*

*Social worker, 10th khoroo, Khan-Uul district*

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*When asked about the positive and negative impacts of the project on the livelihood and health of the local people the most frequent answers were:*

- Water supply demand for Ulaanbaatar city will be met, but locals will need water for their needs as well
- Creation of jobs for locals.
- Supply of safe, quality drinking water for locals would be beneficial.
- The project implementation period is very extensive-till 2026 so locals might start spreading rumors about the project so an ongoing engagement with the community and regular information dissemination is important.

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*"It is important to provide the most accurate and fact-based information on the project to locals on an ongoing basis. Otherwise, rumors and "word of mouth" information will be spread which may lead to negative impacts. An ongoing engagement with stakeholders is crucial."*

*Social worker, 13<sup>th</sup> khoroo, Khan-Uul district*

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1. *When asked if the project will change the value of land in the area answers were:*

- Yes, prices may go up if the apartments in Morin hill will be connected to fresh water supply pipelines.
- Maybe the price will decline since the clean water pipelines are planned to be installed later in the project and the project will be completed only by 2026
- Since there will be new infrastructure, people would eventually migrate so it may affect land value.

*When asked about the positive and negative impacts of the project on the local economy, the most frequent answers were:*

- There are positive impacts. There is a fertile soil in this area so with clean water supply even more businesses can be started.
- Local economy can improve as this area has no heavy traffic and in addition new water supply pipelines will be installed.
- As for negative impacts, with water available for their operations businesses can start their operations illegally and eventually pollute the environment.

## **2. Summary of interviews with local health staff (doctor)**

*When asked about where residents usually get water from and what are the water related diseases the answers were:*

- There is lack of official studies on water related diseases among locals

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*"Water is the source of life. All parties involved in this project, the government and non-government organizations, contractors should develop a risk management plan so they can take necessary actions to mitigate those risks."*

*Health worker, 10th khoroo, Khan-Uul district*

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- The hardness of the water is high, you can see white traces left when you boil the water. At the least it affects dental health of locals.
- Residents of ger area get their water from public wells which is tested in laboratories. .

*When asked about the positive and negative impacts of the project on the livelihood and health of the local people the answers were:*

- Supply of safe drinking water will positively affect the health of locals.
- Construction works may increase the dust and air pollution which might lead to respiratory diseases among children and elderly. Dust suppression is necessary.
- The contractor should pay attention to the lighting of the roads since bad lighting may cause a greater number of road accidents.
- Close distance of the project site to schools and kindergartens may impact the safety of children.
- Residents live on the both sides of the main road, which impacts the safety of children and elderly. When the construction works start road crossing will be difficult so road crossings should be marked appropriately.
- It is important to take all safety measures during the construction phase, to cover all pits during earthworks to avoid any accidents involving children and others.

### **3. Summary of interviews with local educational staff (teacher, manager, school social worker)**

*When asked about where residents usually get water from and what are the water related diseases the answers were:*

- The school gets water from the integrated water supply system. But the hardness of water is high. The water needs to be filtered. Sometimes the school supplies bottled drinking water.
- It is impossible to drink supplied well water due its hardness, it leaves white stain traces when boiled, so now most residents get bottled drinking water.
- The schools have water filters installed.

*When asked what the positive and negative impact of the project on the activities of local schools and kindergartens would be, the answers were:*

- Big trucks used in construction will increase the traffic load. Drivers might not see the children from the truck cabins, which may affect children's safety. Necessary preventive measures should be taken.

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*"I don't see any benefits for locals in supply of water from our area to Ulaanbaatar residents. Furthermore, it might have negative impact on our livelihood such as decrease of water resources."*

*School manager, 12th khoroo, Khan-Uul district*

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- Depends on the project duration and remoteness of the school from the main road.
- There is a part of school territory behind the school building where students play and sport events are organized. If this area is affected by the project it will negatively affect our activities.

*When asked about child labor in the area the answers were:*

- Children are employed in horse racing as jockeys, in agriculture and farms during summertime, they usually get daily food and some financial compensation.

### **4. Summary of interviews with local law enforcement staff (police officer)**

**When asked about the criminal rate in the area the answers were:**

- The crime rate is relatively low. Most crimes are theft, conflicts, domestic violence cases related to excessive alcohol consumption. The number of road accidents has grown due to a greater number of big trucks involved in traffic.
- Accidents and crimes related to gravel mining open pits are relatively low since they have installed fences around the pits.
- Crimes are mostly committed by unemployed people who have no income sources.

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*"This area is a transit route to Dundgobi and Tuv aimag, so it is relatively crowded with many activities going on. I don't think that workload will increase when earthworks of another project starts."*

*Police officer, 12th khoroo, Khan-Uul district*

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#### **4.3.3.2 Summary of Key Informant Interviews in Songinokhairkhan District**

Key informant interviews at Songinokhairkhan district were conducted with local government staff (social worker and environmental officer), health worker and law enforcement representative (police officer) on June 4<sup>th</sup>, 2020 at the 20<sup>th</sup> khoroo and on May 20<sup>th</sup>, 2020 at the 32<sup>nd</sup> khoroo.

##### **1. Summary of interview with local government staff (social worker)**

*When asked about migration in the area the answers were:*

- The migration might increase with the development of new infrastructure

*When asked about the positive and negative impacts of the project on the livelihood and health of the local people the most frequent answers were:*

- Creation of full-time jobs for locals.
- Improved livelihood of locals.
- Supply of quality safe drinking water for locals.
- Dust generation during the construction phase

##### **2. Summary of interview with local health staff (doctor) KKI summary**

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*"This project is much needed for our community since fresh water supply will be provided. I want this project to start as soon as possible. It is important to meet all Khoroo residents and give detailed and accurate information on project"*

*Social worker, 32<sup>nd</sup> khoroo, Songinokhairkhan district*

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*When asked where residents usually get water from and what are the water related diseases the answers were:*

- There is relatively low water related diseases among locals, some cases of gastro intestinal diseases were not confirmed to be related to the water quality.
- The water is rusty and high in sodium

*When asked about the positive and negative impacts of the project on the livelihood and health of the local people the answers were:*

- Supply of safe drinking water will positively affect the health of locals.
- Allergies due to dust particles are widespread among locals. Dust will increase with the project start. Construction work may affect dust and air pollution which might lead to allergies and respiratory diseases among children and elderly.
- It is important to take all safety measures during the construction phase and cover all pits during earthworks to avoid any accidents involving children and others.



### **3. Summary of interview with local law enforcement staff (police officer)**

**When asked about the criminal rate in the area the answers were:**

- The crime rate is relatively low. Most crimes are theft, conflicts, domestic violence cases related to alcohol consumption. Lately the number of road accidents has increased due to traffic of big trucks.
- The unemployment rate is high especially in the 8<sup>th</sup> Kheseg<sup>19</sup>,
- Conflicts related to land acquisition are very common since a lot of businesses operate in the area.

### **4. Summary of interview with local environmental staff (Environmental ranger)**

*When asked about environmental specifics of the area and concerns related to the project the answers were:*

- Many factories, business operate in the 32<sup>nd</sup> khoroo which generate a lot of waste
- The dust issue is affecting health of locals
- It is planned to drill 30 boreholes which may affect groundwater resources

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*"All project activities are related to environment. You have to ensure that all your activities and project documents are developed according to law. You have to cooperate with me on the ongoing basis"*

*Environmental ranger, 20<sup>th</sup> khoroo,  
Songinokhairkhan district*

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#### **4.3.3.3 Key Informant Interviews NGOs and other organizations**

Key informant interviews at National Committee on Gender Equality, Human Rights Commission, State Specialized Inspection Agency, MCUD and Gender Equality Center (NGO) were conducted with social and gender staff between Oct 3<sup>rd</sup> and Oct 15<sup>th</sup>, 2020. Summary of these interviews are provided in Section 6.2.

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<sup>19</sup> Ulaanbaatar city is divided into nine Districts, which are further subdivided into khorooos (subdistrict) and each khoroo is further divided into khesegs (micro- districts). Khesegs are the smallest administrative units containing no more than few hundred households.

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## 5. Project Description

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As noted in Section 1.1 and illustrated by Figure 1-1, according to the hydrogeological investigation conducted by AECOM during the 2017-2018 feasibility study, projections of water demand compared to available bulk water supply indicate a future shortage of water in UB. By developing additional wellfields in the vicinity of Biokombinat and Shuvuun and thereby increasing groundwater withdrawals from the regional surficial aquifer, the proposed BWSE would supply additional water to the city's water supply system and partially address the anticipated shortfall in water supply capacity. The project includes a proposed AWPP designed to eventually treat up to 140,000 cubic meters per day of raw water from the wellfields to a purified drinking water state, and conveyance facilities to deliver water, from the two wellfields to the AWPP and from the AWPP to the USUG water distribution network.

### 5.1 Project Components

The proposed BWSE would develop two wellfields in the vicinity of Biokombinat and Shuvuun, downstream of the CWWTP effluent discharge to the Tuul River. Local raw water transmission branch, or collection, pipeline systems on each wellfield would carry the abstracted groundwater to two raw water transmission main pipelines, which in turn would carry the water to the proposed AWPP. After purification, the finished water would be carried by proposed dual finished water transmission main pipelines from the AWPP to the USUG water distribution network.

The BWSE facilities just described will require power and heat supply to operate. These will be constructed under a separate contract to provide high voltage transmission lines and substations to feed power to the AWPP and conveyance infrastructure, and hot water supply lines, heat exchangers, and a booster pump station to heat facilities at the AWPP. At the time of writing, the design of these elements is not yet contracted; supplemental ESIA's will be developed during design to update this document, current best estimates of times for conclusions of supplemental ESIA are by April 2021.

Independently and contemporaneously to BWSE project development, the GoM will be designing and building a new CWWTP to replace the old one, which is overloaded and underperforming. The development of the new CWWTP impacts the BWSE project in two major ways: the first is a direct interaction as the brine effluent from the AWPP will discharge directly to the new CWWTP effluent channel. Secondly, the expected improved quality of CWWTP effluent will have beneficial effects on the quality of Tuul River water quality and on the groundwater quality of downstream wellfields.

Furthermore, the BWSE potentially would be developed parallel to a number of other projects, including a gold refinery, an oncology unit, and nursing school. The cumulative impacts of these and the new CWWTP are presented in Section 9.

#### 5.1.1 Wellfields

Detailed hydrogeological investigations were carried out at the proposed Biokombinat and Shuvuun wellfields between May and September 2019, according to the requirements set forth by the WRC in a May 2019 work order. The results of pumping tests coupled with soils and other field data undertaken for the geophysical-hydrogeological investigations were used to prove the resource; i.e., demonstrate that the aquifer could safely yield the AWPP projected demand without environmental impacts to the wellfields.



The WRC<sup>20</sup> approved the Geophysical-Hydrogeological Investigation Report (AECOM, 2019a) findings and approved the Biokombinat and Shuvuun wellfields as Category C water resources. This classification indicates that the wellfields are *inferred* new water supplies, due to the following:

- Pumping tests at 18 of the 30 test wells used a pumping rate (33 liters per second) that was much lower than the projected demand of the final production wells, although the remaining 12 test wells used a pumping rate (65 liters per second) that was close to the projected demand.
- Groundwater quality in part or all of the proposed wellfields does not meet Mongolian drinking water standards, as evidenced by water quality analyses undertaken during the hydrogeological investigations, and as such water purification would be required before the water from the wellfields could be used for public consumption.

The WRC specifically noted that water purification would be required before the water from the wellfields could be used for public consumption. The WRC approved the wellfields with the approved capacities shown in

Table 5-1. The Secretary of MET formally approved the wellfields as water resources on December 26, 2019.

**Table 5-1 WRC-Approved Wellfield Capacities**

Wellfield	Withdrawal Rate	
	cubic meters per day	liters per second
<b>Biokombinat</b>	63,590.4	736
<b>Shuvuun</b>	76,460.0 <sup>21</sup>	885
<b>Total</b>	<b>140,054.4</b>	<b>1,621</b>

Sanitary protection zones have been designated for each well in the two wellfields to protect the aquifer from depletion, pollution, and degradation, which extend for 500 meters around each well. The sanitary protection zone comprises a sanitary restriction zone, which extends 100 meters from the well, and a sanitary limited zone, which extends for another 400 meters from the borders of the restriction zone. The zones are delimited as depicted on Figure 1-2. Per Article 3.9 of the *Procedure for Compliance with Water Resources, Special and Ordinary Protection and Sanitary Zones of Water Sources*, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development, the following activities are prohibited within these zones:

- Erosion of topsoil, felling of trees and shrubs, mining of sand and gravel
- Reserving decommissioned boreholes for technical and other purposes
- Disposal of untreated wastewater and waste, and placement of tailings ponds
- Activities affecting the earth layer directly above the groundwater aquifer
- Drilling wells and boreholes for research and non-drinking purposes

<sup>20</sup> According to Mongolian law on Water (articles 4.5 and 4.6), the WRC is main authority that approves water resources for development in Mongolia.

<sup>21</sup> The total approvable groundwater resource for the proposed Shuvuun wellfield was estimated to be 76,464 cubic meters per day. However, the approvable resource was reported as 76,460 cubic meters per day in the Conclusions and Recommendations section of the Geophysical-Hydrogeological Investigation report (AECOM, 2019a) and, in turn, this value was designated the official, approved capacity of the wellfield.

- Drilling private wells and boreholes for domestic and drinking purposes in areas with centralized water supply facilities and networks
- Using all kinds of fertilizers and pesticides
- Placing and storing petroleum products, chemicals, radioactive substances and minerals containing them, and substances that may spread infectious disease
- Gas stations and car washes
- Processing and storing raw materials of animal origin
- Construction and operation of residential, industrial, and commercial buildings
- Granting rights to own, possess, and use land

The perimeter of each wellfield would be fenced, as shown on Figure 5-1 and Figure 5-2.

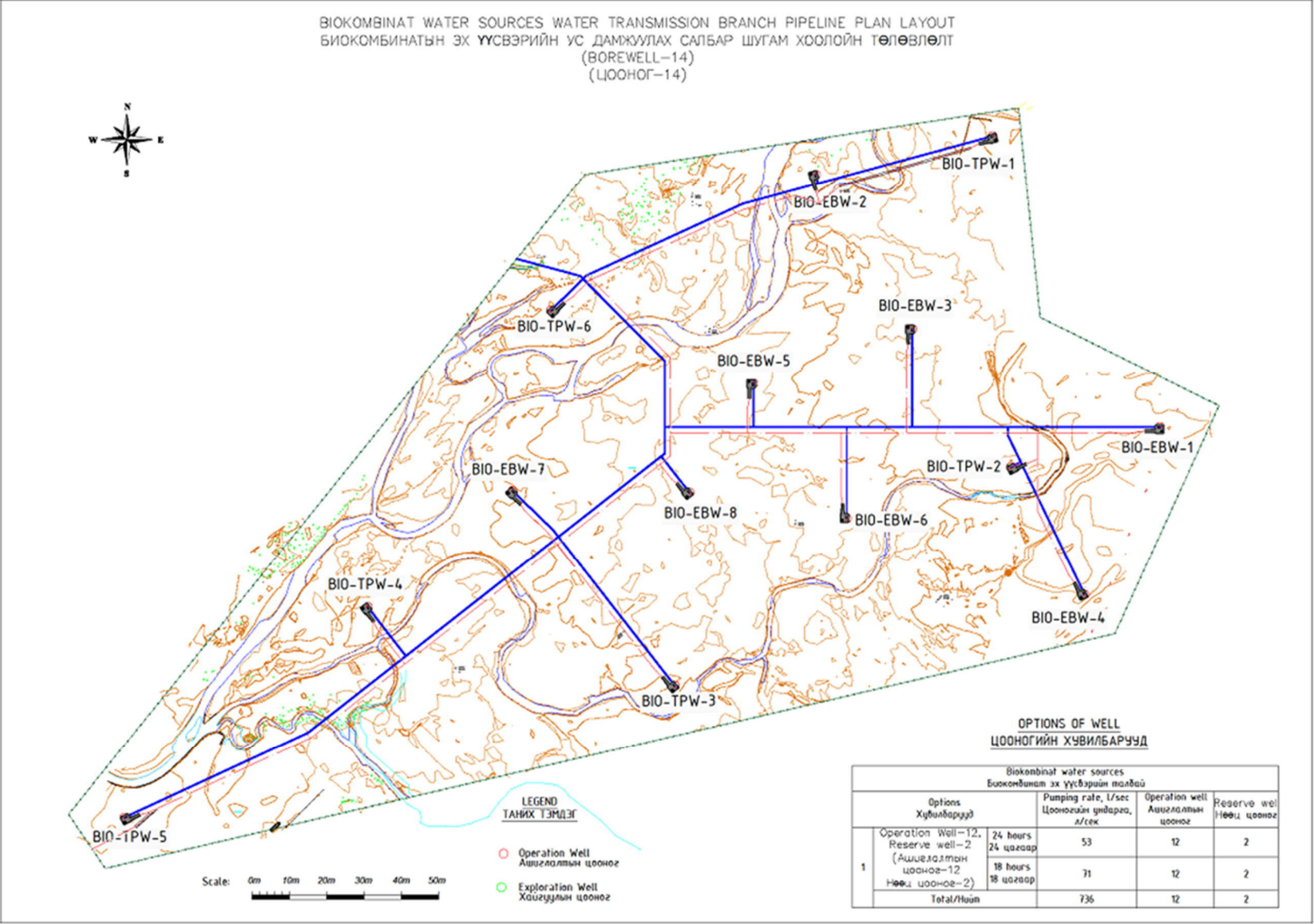


Figure 5-1 Production Well Locations - Biokombinat Wellfield

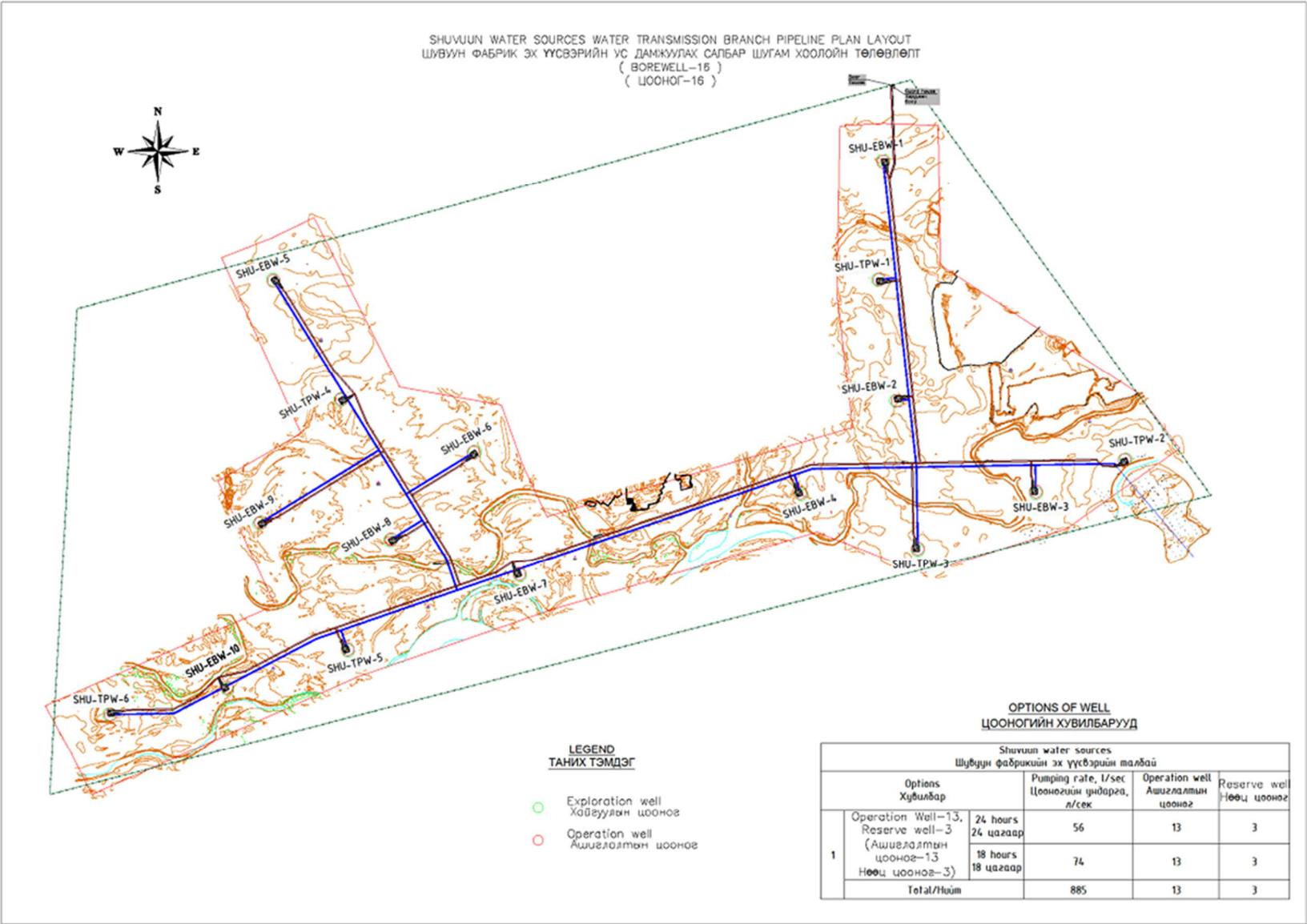


Figure 5-2 Production Well Locations - Shuvuun Wellfield

## 5.1.2 Production Wells

The number of proposed wells and well locations are based on the results of the geophysical-hydrogeological field investigations, analysis of the field data, government regulations, and the approved proven resource or capacity of each wellfield (see Table 5-2). Considered in the number of wells, pumping rates, and pumping durations are Mongolian regulations requiring that a reserve capacity (percentage of flow) be maintained should a well or wells be offline for maintenance. Under Construction Code of Mongolia CCM 40-02-16, *Water supply: Pipeline networks and facilities*, Water Supply System Category I wellfields with 13 or more operational wells, such as the proposed Biokombinat and Shuvuun wellfields, require a number of standby wells equating to at least 20 percent of the total number of operational wells, per Article 7.13 of the code.

Because significant data (soil type, bedrock depth, aquifer thickness, pumping test drawdown, estimated aquifer parameters) had been obtained and evaluated from each test well location, the proposed production wells would be installed adjacent to the existing test wells. This would avoid the risk of drilling a well at a location where the hydrogeology could be significantly different than at or near those locations already investigated. However, the new production wells would be located at least 5 meters from the existing test wells. This would allow the test wells to be a safe distance from production well installation and pumping station construction, while allowing the well to be used for long-term monitoring of groundwater levels.

Based on the approved wellfield capacities and these criteria, 14 production wells would be established at the proposed Biokombinat wellfield and 16 production wells would be established at the proposed Shuvuun wellfield. Figure 5-1 and Figure 5-2 show the proposed well locations. Table 5-2 indicates the proposed number of operational wells, daily hours of operation, pumping rates, and reserve capacities. These proposed number of wells, pump rates, and operating hours were presented to and approved by the Ministry of Construction and Urban Development, Construction Development Center expert on hydraulic constructions in January 2020.

**Table 5-2 Pumping Rates and Quantities for Production Wells**

Wellfield	Production Wells	Operational Wells	Daily Operating Hours	Pumping Rate per Well (l/s)	Wells in Reserve	Reserve Capacity (%)
<b>Biokombinat</b>	14	12	18	71	2	17
<b>Shuvuun</b>	16	13	18	74	3	23

**Note: l/s indicates liters per second.**

Operational best practice is to not run a well 24 hours a day, and thereby rest the electromechanical components of the well system and the aquifer under the influence of the well. Furthermore, standby wells cannot be left idle indefinitely as they cease up. Therefore, well operations would be cyclical to get equal use from all of the wells at each wellfield. By lagging the operation cycles of the wells, at any given time wells at both wellfields would be operating and other wells would be in reserve, as provided in Table 5-2. However, at full buildout and capacity, and ultimate demand, the new wells would produce a total of 50 million cubic meters of water per year, by pumping wells that otherwise would be held in reserve or by increasing the daily operating hours.

The proposed production well design was based on the proposed pumping rate, soil boring log and specific capacity of the adjacent test well, estimated production well drawdown, and pump manufacture requirements. The proposed well design is a 450-millimeter by 600-millimeter diameter artificial filter-packed well. The 450-millimeter-diameter stainless steel well casing and screen would be installed in a 600-millimeter-minimum diameter borehole drilled to bedrock or a maximum depth of 60 meters. An artificial filter pack would be installed between the stainless-steel well screen and lower section of casing, and the borehole wall. Once installed, the proposed



production well would be fully developed and pump tested to confirm the well's pumping capacity and to establish a baseline specific capacity.

Based on the test well drilling, most production wells would be installed to 60 meters. Four production wells are anticipated to be installed to a depth less than 60 meters. These wells would be located on the south side of the Biokombinat wellfield, where bedrock was encountered at a depth less than 60 meters.

To extend the useful life of the wells, stainless steel well casings and well screens would be installed. The use of like metals where the well casing and screen meet would minimize the possibility of dissimilar metals leading to corrosion.

An artificial filter-pack would be installed between the borehole wall and the well screen, from the base of the well to approximately 8 meters above the top of the well screen. The use of artificial filter-pack, in lieu of standard gravel-pack, would increase the efficiency and useful life of the well. The round glass beads of the artificial filter-pack decrease the amount of drawdown in the well and can decrease well development time and reduce the frequency of well cleanings. One meter of transition pack (fine sand) would be installed above the artificial filter-pack prior to installation of the concrete sanitary seal, to prevent the concrete seal from impacting the filter-pack.

### 5.1.3 Advanced Water Purification Plant

Groundwater from the Shuvuun and Biokombinat wellfields would be conveyed, directly from the production wells, to the AWPP for purification. At final build out, the AWPP would have a raw water capacity of 140,000 cubic meters per day or approximately 50 million cubic meters per year. However, a two-phase construction program is required for the AWPP because the initial and future groundwater quality, as well as the short term and long term future demands, are unknown. The phasing approach will provide an immediate and substantial capacity of treated drinking water, but defers the final "build-out" capacity to an unknown later date, thereby reducing the cost of the Phase I construction. Phase I will provide a maximum reliable treated water production of up to 75,000 cubic meters per day, with one treatment train out of service, and with a peak production of up to 108,000 cubic meters day with all equipment in service. Phase II will add equipment to enable treatment of the total wellfields "build-out" capacity of 140,000 cubic meters per day. However, there will be no phasing of wellfields or pipelines construction. The combination of the Shuvuun and Biokombinat wellfields will provide the build-out capacity upon completion of CP-1 and the raw water and treated water conveyance design in CP-3 is also sized for the build-out capacity.

After purification, the potable water would be pumped from the AWWP to supply the UB water distribution system. The AWPP would provide high-quality drinking water to the existing USUG water distribution network. In the network, water from the AWPP would blend with water from the current USUG wellfields. The ratio of AWPP water versus current USUG sources would change over time, as more connections are installed to the finished water pipeline and as demands increase on the west side of the city.

According to the report *Hydro-economic Analysis on Cost Effective Solutions to Close Ulaanbaatar's Future Water Gap* (2030 Water Resources Group, 2016), USUG supplies 150,000 cubic meters per day to the water supply system of UB by using existing wellfields. The AWPP is designed to provide a sustained maximum day flow of up to 75,000 cubic meters per day, with the possibility of future expansion. However, actual demands upon commissioning of the AWPP in 2024 are unknown, although it is expected that initial demands would be low.

The AWPP would include processes to inactivate pathogens, remove heavy metals, and remove industrial chemicals or other contaminants, whether naturally occurring or caused by human

activity. The AWPP would employ conventional and advanced water treatment processes, and residuals handling processes, as summarized in Table 5-3.

**Table 5-3 AWPP Treatment Processes and Residual Handling Processes**

Conventional Treatment	Advanced Treatment	Residual Handling
<b>Pre-oxidation</b> <b>Coagulation</b> <b>Flocculation</b> <b>Clarification</b> <b>Filters</b>	Ultraviolet disinfection Membrane filtration—initially nanofiltration and possible future reverse osmosis	Spent filter wash water tanks Thickeners Centrifuges Brine from membrane filtration

There will also be a package wastewater treatment plant (WWTP) at the AWPP compound for the treatment domestic wastewater from the facility (i.e. toilets, sinks, showers) with a treatment capacity of 9 cubic meters per day. The treated effluent from the WWTP will be discharged to the brine sewer for disposal, along with brine, in the effluent channel of the CWWTP.

Figure 5-3 illustrates the AWPP water treatment and residual handling process flows.

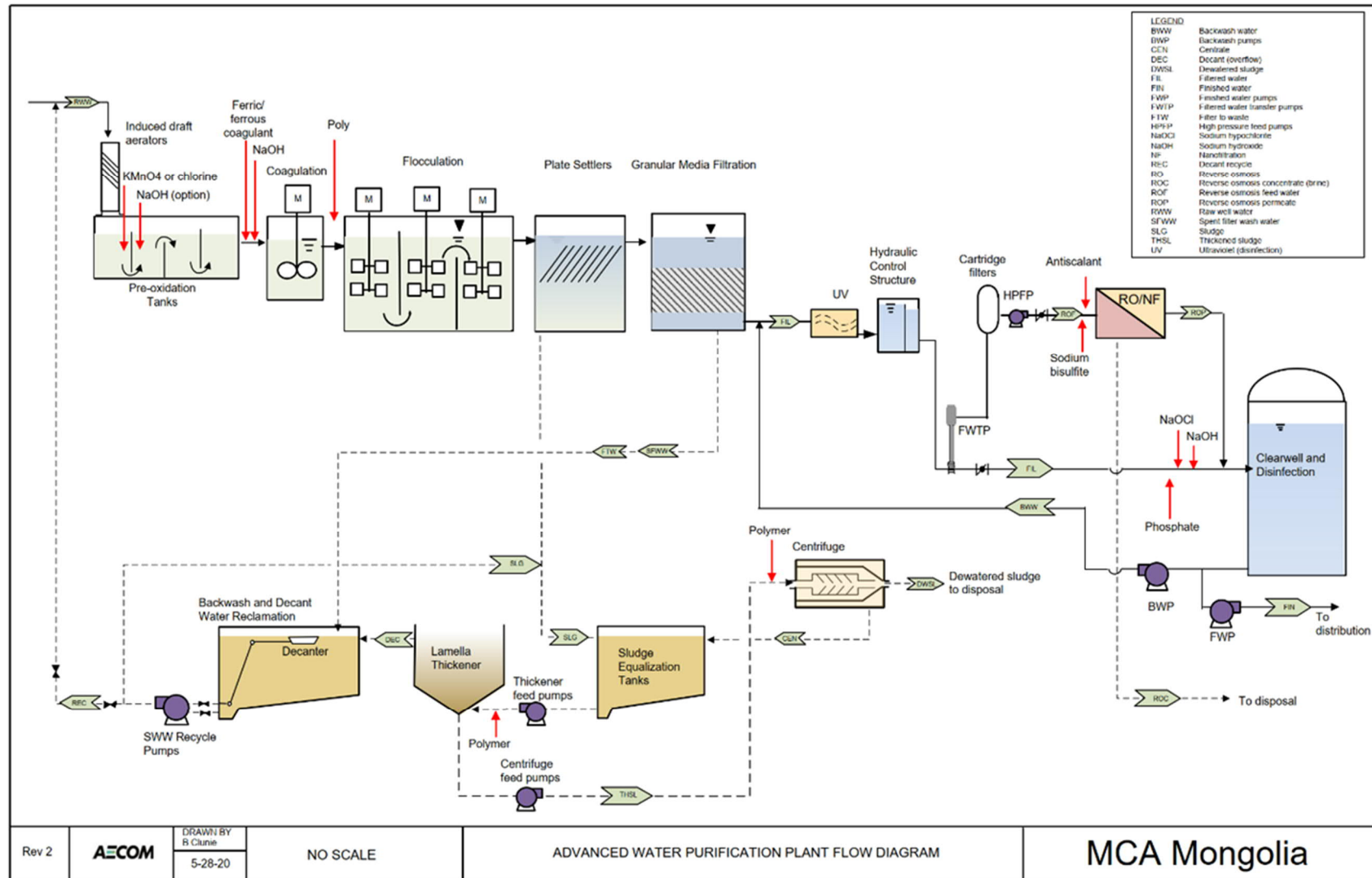


Figure 5-3 Process Flow Diagram



### 5.1.3.1 Treatment Processes

The AWPP would treat initial and future source water quality—see Section 5.3.1. The initial water quality was established via the completion of the Biokombinat and Shuvuun test wells hydrogeological study, conducted in 2019. From July through September 2019, AECOM collected groundwater quality samples from exploratory and test wells at the two proposed wellfield sites. The groundwater samples were analyzed for chemical, heavy metal, and bacteria constituents, and for volatile organic carbons (VOCs) and total organic carbons (TOCs). Based on the results of the analyses, the groundwater quality characteristics were assessed against the norms for sanitation grade of surface water and the Mongolian drinking water quality standards at MNS 0900:2018.

Due to potential degradation of groundwater quality in the future, the AWPP has been designed to treat the surface water quality evidenced in the Tuul River in the vicinity of Biokombinat and Shuvuun, as the most prudent approach to treatment. The plant has been conservatively configured to address the following:

- High concentrations of bacteria and viruses
- Potentially high concentrations of iron and manganese (3 and 4 milligrams per liter, respectively)
- Low to moderate concentrations of total dissolved solids (less than 500 milligrams per liter)
- Moderate to high concentrations of total organic carbon/dissolved organic carbon (4-12 milligrams per liter)
- Low to moderate turbidity (1-10 nephelometric turbidity units)
- Trace organics such as tetrachloroethene, trichloroethene, acetone, chloroform, and toluene
- Low to moderate concentrations of inorganics (hardness, cadmium, fluoride, arsenic, nitrate, lead, molybdenum) and heavy metals

Finished water quality would meet the Mongolian drinking water quality standards at MNS 0900:2018, and the United States Environmental Protection Agency (USEPA) primary and secondary drinking water standards at 40 Code of Federal Regulations 141 and 143, respectively. Finished water quality also would closely match existing distribution system parameters with respect to potential of hydrogen (pH), alkalinity, and free chlorine.

The AWPP would receive source water that would undergo significant blending. The first level of blending would be by virtue of 30 individual wells extracting groundwater from the proposed Biokombinat and Shuvuun wellfields. Sourcing the water from numerous wells would dilute certain parameters that may be high in only a few specific wells.

The second level of blending would occur in the flow monitoring vault at the AWPP where the raw water from Shuvuun and Biokombinat combine before being sent for treatment to the AWPP.

Table 5-4 summarizes the proposed unit processes within the AWPP and the capability of each process to remove source water constituents. The following paragraphs provide additional details.

**Table 5-4 AWPP Unit Processes**

Process Step	Contaminant Removed
<b>Forced draft aeration</b>	VOCs, hydrogen sulfide (H <sub>2</sub> S), iron
<b>Pre-oxidation (potassium permanganate [KMnO<sub>4</sub>] or chlorine)</b>	Iron, manganese, bacteria, viruses, some organics
<b>Coagulation, flocculation, plate settlers</b>	Heavy metals (cadmium, lead), some organics, turbidity, particles, bacteria, viruses

Process Step	Contaminant Removed
<b>Granular media filters</b>	Pathogens, some organics, bacteria, viruses, particles, turbidity
<b>Ultraviolet disinfection</b>	Pathogens ( <i>Giardia</i> and <i>Cryptosporidium</i> ), bacteria
<b>Reverse osmosis or nanofiltration membranes (up to 60% filtered water side stream)</b>	Pesticides, micro-pollutants, pathogens, total dissolved solids, fluoride, nitrates, organics, heavy metals
<b>Primary and secondary free chlorine</b>	Pathogens, viruses, bacteria

The blended source water would first flow into the forced draft aerators. The aerators would remove volatile organic compounds, as well as hydrogen sulfide, if present, and would partially oxidize iron. If present, VOCs that are transferred from the aqueous phase to the gas phase through forced draft aeration would discharge to the outside atmosphere through ductwork penetrating the exterior wall of AWPP Building 10, where the stripping aerators are located. The presence of VOCs, and their concentration, is only presumptive at this time, therefore, it is not practical or cost effective to provide a mechanism for scrubbing the aerator off-gas. Recognizing the occupational safety and health risk, as well as other detrimental impacts of poorly ventilated spaces, further compounded by the potential threat of VOCs, the ventilation system at the AWPP has been designed and sized to provide three air changes per hour throughout the treatment facility. This comes at the cost of greatly increased energy consumption.

After air-stripping, aerated water would drop down into cast-in-place baffled pre-oxidation tanks for contact time with potassium permanganate or chlorine. This would oxidize iron and manganese and would provide a significant level of disinfection. Each tank would be equipped with submersible mixers to keep insoluble material in suspension. It is expected that some oxidized iron and other particles would accumulate in the oxidation tanks. Therefore, each tank would be equipped with a sloped floor and drain for wash down of settled material.

Post-aerated water would flow through two-stage rapid mixing basins for coagulation and pH adjustment. Based on bench scale testing, it was determined that iron coagulants would be superior to aluminum coagulants (alum) and would be used in the AWPP. Caustic soda would be used to adjust the pH. Allowance for a low dose of non-ionic polymer would be provided ahead of flocculation. With one of the four trains out of service, the other three trains of pre-oxidation, coagulation, flocculation, and plate settlers will be capable of providing the maximum finished water capacity of 75,000 cubic meters per day.

Based on the flow rates, operators would choose how many trains to operate. However, for flexibility, a common coagulated water channel would allow operators to utilize any of the four pre-oxidation/coagulation unit processes with any of the flocculation/clarification processes. Flocculated water would flow to the stainless-steel inclined plate settlers, equipped with sludge extraction equipment and sludge pumps. A common clarified water pipe would allow any of the four pre-treatment trains to serve any of the six granular media filters.

The granular media filters have been sized to allow one to be out of service. The filters would operate in parallel, and filtered water would be delivered to two main collector pipes, one for each side of the filter gallery. The combined filtered water would flow through ultraviolet disinfection medium-pressure reactors capable of a 2-log *Cryptosporidium* (99 percent) and *Giardia* inactivation. A weir downstream of the ultraviolet reactors would provide for flooding of the reactors at all times and would trap filter effluent.

A filtered water pipeline sized for the maximum future flows would discharge into the clearwells. A branch off this pipeline would serve the reverse osmosis building. Although nanofiltration membranes initially would be installed, AECOM designed the AWPP based on reverse osmosis filtration of 60 percent of total flow. Design of the electrical and mechanical systems that attend

the advanced treatment system are based on reverse osmosis, regardless of whether reverse osmosis or nanofiltration membranes ultimately would be employed, since reverse osmosis membranes would require higher electrical loads.

AECOM evaluated the risk versus cost benefit associated with nanofiltration membranes. Nanofiltration membranes would provide significant operating costs savings while posing manageable risk to water quality. Therefore, nanofiltration membranes would be installed for initial operations. However, the operations of the AWPP would include continual monitoring of source and treated water quality to determine if a change to reverse osmosis membranes is warranted. Further, if it becomes necessary to make this change, it may be necessary to discontinue using wells that contribute most to the poor water quality in favor of wells with better quality, and it may also be necessary to reduce the amount of source water to the AWPP until the reverse osmosis membranes and new high pressure feed pumps can be installed.

Vertical turbine in-line pumps would transfer a side stream of up to 60 percent of the filtered water through 5-micron cartridge filters and to the suction of the reverse osmosis/nanofiltration system high pressure feed pumps. An antiscalant would be dosed ahead of the reverse osmosis/nanofiltration skids, and an allowance for the addition of sodium bisulfite would be included to strip any residual chlorine and thereby protect the reverse osmosis/nanofiltration membranes from the effects of chlorine. Brine from the reverse osmosis/nanofiltration system would be disposed of to the brine sewer for transport to the CWWTP effluent channel—see Section 5.1.3.2.2.

Permeate from the reverse osmosis/nanofiltration system would be combined with the filtered water, and sodium hypochlorite (NaOCl), caustic soda (NaOH), and phosphate ( $\text{PO}_4^{3-}$ , if needed) would be dosed to the combined stream. The combined flow would enter the contact tanks/clearwells. Three basins would be provided but have been sized to allow one to be out of service. The contact tanks would be baffled and would provide 0.5-log inactivation of *Giardia* and 2-log inactivation of viruses. The high service pumps and filter backwash pumps would take suction from these tanks. Plant water—i.e., finished water that is returned back to the treatment facility—also would be withdrawn from the clearwells for numerous incidental uses, such as washdown water, carrier water for chemicals, chemical batching water, cooling water (if needed), and heating, ventilation, and air conditioning makeup water.

Plate settler blowdown would be transferred to sludge equalization tanks, and then forwarded to two lamella thickeners located in the Residuals Treatment Building. Polymer would be provided to assist with settling and thickening. The thickened sludge would be forwarded to an equalization tank and from there to a pair of dewatering centrifuges. Polymer and wash down water would serve the centrifuges. The thickener decant would be delivered to the spent wash water tanks. Centrate from the centrifuges would be collected in the sludge equalization tanks.

Spent filter backwash water and filter-to-waste water would be collected in two recovery tanks and allowed to settle for 6 hours, after which time recycle pumps would be used to return the decanted water to the head of the plant at a rate no greater than 10 percent of the raw water flow. Solids that accumulate would be forwarded (using the recycle pumps and valving) to the sludge equalization tanks in the Residuals Treatment Building.

### **5.1.3.2 Residual Handling and Wastewater Disposal**

The residuals handling system would receive wastewater from spent wash-water tanks and sludge from plate settlers for treatment. The system would produce compacted residual sludge requiring disposal and separated liquids residuals to be recycled in the plant or disposed of separately. Sanitary waste and incidental flows from within the AWPP also would require disposal.

### 5.1.3.2.1 Dewatered Sludge

Naturally occurring solids would be present in the source water, but the vast majority of the total solids produced at the AWPP would be from the interaction between the naturally occurring solids and coagulants and oxidants used to treat the source water. The solids would be treated through a series of gravity settling and mechanical processes, resulting in a final dewatered solids load. Volumetrically, dewatered solids loads are low, but from a mass balance standpoint, they represent the most highly concentrated waste stream.

Operating at peak raw water capacity under Phase I initial construction, the AWPP residuals handling system would produce approximately 9 cubic meters per day of dewatered sludge. The quantity of dewatered sludge would increase to about 10 cubic meters per day at peak capacity under Phase II expansion. The dewatered sludge would be collected in a 25-cubic meter roll-off container for disposal off site. Options for final disposal of these solids comprise the following (AECOM, 2020a):

**Disposal to New CWWTP** – Under this option, the dewatered sludge would be hauled approximately 7 kilometers to the new CWWTP for co-mingling with sewage sludge. The main advantage of this option is that sludge handling facilities already would be in place at the new CWWTP, and the AWPP sludge likely would represent a relatively small contribution to the total volume of sludge produced. However, a disadvantage is that the dewatered sludge would need to be hauled frequently from the AWPP to the new CWWTP, which would be costly. Assuming maximum raw water flow conditions, hauling would be required approximately every other day.

It should be noted that the new CWWTP is not part of the BWSE program; it is a separate project overseen by the project management unit of the MCUD and financed by the GoM. The current CWWTP is undersized and underperforming, and it is discharging non-compliant effluent to the Tuul River; the new CWWTP, designed to meet influent loads and effluent standards, will replace the current one once built. The project is an important step in improving Tuul River water quality and, as a consequence, groundwater quality downstream of UB too. The implementation of the project is a condition precedent for the entry into force of the Compact agreed between MCC and GoM.

- **Sand Drying Beds** – This option would entail transferring the dewatered sludge to a drying bed; essentially, a large, open excavation approximately 1.5 to 2 meters deep with a sand subgrade. The sludge would be spread out using a backhoe or harrowing tractor, with the objective of spreading out the sludge so as to maximize its exposure to the atmosphere. In time, heat, wind, evaporation, and freezing and thawing would dry the sludge to over 50 percent solids, and potentially greater than 60 percent under Mongolia's relatively dry, arid, and windy climate, with very cold winters.

The advantage of the drying bed option is the simplicity and low cost, but the drawback is that a large parcel of land would be required for locating the drying beds. Preliminarily, assuming a depth of applied dewatered sludge of 0.25 meters, a 2-hectare area of 100 meters by 200 meters would be required for a full year's production of dewatered sludge at the maximum AWPP flow. Eventually, the sludge would need to be consolidated and stockpiled elsewhere, perhaps in a dedicated area of the drying bed facility, to make way for additional dewatered sludge. Water draining through the sand layer could enter the groundwater, requiring the use of monitoring wells to assess any adverse impacts to groundwater quality.

- **Private Hauling and Disposal** – In the United States, it is common practice for dewatered sludge to be managed by a third-party private contractor. Often, sludge is brought to landfills or incinerators, or put to beneficial use for landfill capping, road subgrade material, or agricultural land application. These options may not be available in UB city.

Final disposal of the dewatered sludge has not been determined. However, AECOM has advised MCA-Mongolia to facilitate discussions with USUG to obtain approval to dispose dewatered solids from the AWPP to the CWWTP. It is AECOM's opinion that this is preferable to drying beds. Ultimately, USUG will operate both the AWPP and the CWWTP, the latter which will generate much larger volumes of waste sludge than the AWPP. Furthermore, new CWWTP will be equipped with larger and more modern facilities that could readily accept and manage the relatively small additional volumes of AWPP dewatered solids. This "co-mingling" is commonly practiced internationally, and has little to no impact on wastewater treatment unit process operations because sludge from drinking water treatment plants (especially those that treat groundwater as is the case with the AWPP) is inert; that is to say, non-septic, resulting from the precipitation of metals and coagulants.

As an alternative to disposing of dewatered solids to the CWWTP, AECOM has considered another option based on the application of engineered lagoons, also referred to as "drying beds", which are essentially holding basins constructed of sloped earthen side-walls and a gravel bottom that allows water to drain through yet retains the solids. This is practiced in regions where land is available to construct drying beds. This process acts to concentrate the solids from, for example, 20 percent solids as initially applied to greater than 50 percent solids after drying, draining, freezing, and thawing. A drying bed is a passive, low energy solution to managing solids. However, eventually the drying beds will become full, and the material must be transferred elsewhere or new drying beds must be constructed. For the BWSE project, the main drawbacks to drying beds are first in identifying and then securing available land that can accommodate the beds, and then mitigating the numerous environmental and social impacts associated therein. This includes managing noise, dust, odors, truck traffic, and the impact to groundwater as a result of solids draining. Because of these drawbacks, co-mingling the dewatered solids with the CWWTP solids is the recommended solution.

#### **5.1.3.2.2 Liquid Residuals**

In contrast to the dewatered sludge, the liquid residuals from the AWPP would be low in solids concentration but would be of high volume. Operating at peak raw water capacity under Phase I initial construction, the AWPP residuals handling system would produce approximately 10,100 cubic meters per day of liquid residuals (AECOM, 2020a, Figure 21). The quantity of liquid residuals would increase to about 11,900 cubic meters per day at peak capacity under Phase II expansion—see Section 5.3.1.

The liquid residuals would include spent filter wash water, filter-to-waste water, thickener decant, and centrifuge centrate, all of which would be recycled to the head of the AWPP for reuse. Membrane filtration concentrate also would contribute to the liquid waste stream and would constitute the majority of the liquid residuals; estimated at approximately 9,600 cubic meters per day at peak capacity under Phase II or approximately 80 percent of the total liquid residuals.

Membrane filtration, whether by reverse osmosis or nanofiltration, would produce a large stream of high purity water, as well as a relatively small stream of process reject water, referred to as brine. Brine is a highly concentrated solution of the salts and contaminants separated from the water with the filtration membranes.

AECOM discussed with the Tuul River Basin Authority, USUG, MCUD, and MET the disposal of brine from the reverse osmosis/nanofiltration system. Alternatives considered included the following:

- Deep well injection
- Pumping and conveyance to the influent of the existing CWWTP



- Pumping and conveyance to the future effluent channel of the new CWWTP, with or without dilution with raw water at the AWPP

Water quality analyses of groundwater from the proposed Biokombinat and Shuvuun wellfield sites undertaken during the 2019 field investigations demonstrated that total dissolved solids are fairly low. This suggests that the reject water from reverse osmosis would have total dissolved solids levels less than the 1,000 milligrams per liter limit for direct discharge to natural streams in accordance with the Mongolian standard on discharge to the environment at MNS 4943:2015. If nanofiltration were used instead of reverse osmosis, the total dissolved solids concentrations would be significantly lower. The total dissolved solids limitation of MNS 4943:2015 would represent the limiting factor in the specific case of AWPP reject water. However, based on analysis of the 2019 well water quality results, discharge from membrane filtration has been evaluated and confirmed to be in compliance with MNS 4943:2011 as presented in Table A-5 of Appendix A

After deliberations and discussions about brine discharge quality and options, the CWWTP Project Management Unit approved discharging the brine via the future CWWTP effluent channel, which will discharge to the Tuul River. In response to a request from USUG, on March 25, 2020, MET issued its official approval for disposal of the brine water produced by the AWPP to the effluent channel.

A proposed brine sewer would transport the brine from the AWPP and discharge it to the future effluent channel, approximately 2 kilometers distant from the AWPP. The brine would mix with the CWWTP effluent, further diluting the total dissolved solids concentrations, and ultimately would be discharged to the river. The sewer would take advantage of the approximately 50-meter elevation difference in the first half of the sewer to cause gravity critical flow. As the sewer slope flattens, the gravity critical flow would create a hydraulic jump and the flow would continue under pressure to the effluent channel of the new CWWTP. The MUB Route Approval Committee approved the route in June 2020. Figure 5-8 shows the route of the proposed brine sewer.

Prior to operation, start-up test water would be generated during the commissioning of the AWPP. The test water cannot be delivered to the distribution system until such time that treatment optimization and testing can be conducted to ensure that it is properly treated. To dispose of the test water, the brine sewer would be used to convey start-up (test) water from the AWPP to the future CWWTP effluent channel. The water would be filtered and disinfected through ultraviolet reactors before entering the brine sewer. Therefore, it is expected to be of higher quality than the brine itself, posing no issues when mixing with the CWWTP effluent in the channel.

#### 5.1.3.2.3 Sanitary Waste

Sanitary waste and incidental flows from analyzers and floor drains would be treated by means of an on-site package wastewater treatment system. The system would comprise a settling tank followed by a small aerated treatment zone. The effluent from the system would be discharged to the brine sewer. The solids would be removed from the system periodically by vacuum tanker and transported to the CWWTP for disposal.

#### 5.1.3.3 Chemical Use

Table 5-5 provides estimates of the chemicals that would be used in the buildings at the AWPP. As shown in the table, the usage of chemicals would change as the water demand and the production of purified water increases.

Table 5-5 Chemical Use as a Function of Demand

Chemical	Unit	Water Demand (cubic meters per day)
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		10,000	50,000	75,000
<b>AWPP Building</b>				
<b>Ferric chloride</b>	liters per month	6,745	31,544	47,295
<b>Dry potassium permanganate*</b>	kilograms per month	579	2,708	4,061
<b>Liquid caustic soda</b>	liters per month	6,028	28,192	42,270
<b>Sodium hypochlorite</b>	liters per month	5,546	25,540	38,237
<b>Phosphate</b>	liters per month	2,600	11,972	17,924
<b>Floc aid polymer</b>	liters per month	40	188	282
<b>Reverse Osmosis Building</b>				
<b>Antiscalant</b>	liters per month	454	2,081	3,068
<b>Dry sodium bisulfite*</b>	kilograms per month	177	812	1,197
<b>Dry citric acid (CIP)**</b>	kilograms per month	45	90	120
<b>Caustic soda (CIP)**</b>	liters per month	50	100	150
<b>Residuals Building</b>				
<b>Dewatering polymer</b>	kilograms per month	110	514	1,149
<b>Thickening polymer</b>	kilograms per month	55	257	575
<b>Notes:</b> * Indicates chemical would not be used if not available. ** Indicates chemical is for intermittent use during clean-in-place treatments that are performed only occasionally.				

As designed, the AWPP would address the risk of handling and storing these chemicals in the following ways:

- Chemicals would be stored within containment spaces, such that the tanks would be surrounded by concrete walls that would confine any chemical spills.
- Ventilation would be provided in the chemical storage areas for evacuation of fumes.
- Emergency eye wash and emergency shower stations would be located throughout the chemical handling and storage areas.

It is expected that the transport of chemicals to site, their handling by AWPP operations staff, and their disposal be done in accordance with Mongolian law and international best practice in terms of occupational safety and health and hazardous waste management and disposal. The design of chemical handling facilities at the AWPP is such to facilitate such good practice.

#### 5.1.3.4 Finished Water Storage and Pumping

Finished water would be stored at the AWPP in three tanks, each sized at 5,670 cubic meters for a total volume of 17,010 cubic meters.

Finished water pumps have been sized based on the pressure requirements at the existing Orbit Junction, the connection point on the USUG network. The pumps would provide 8 bars (800 kilopascals) of delivery pressure to a pressure control station just upstream of the connection point. The pressure control station would be provided to lower operating pressures if desired.

#### 5.1.3.5 Operations Control

A central supervisory control and data acquisition system control room at the AWPP would be used to monitor and control operations at both wellfields and at the AWPP. In this way those workers directly responsible for AWPP operations would also be able to control operation of the wellfields that provide water to the plant, including which well pumps are operating and the flowrates of the water, and of the finished water pump station that sends water to the USUG water distribution network.



### 5.1.3.6 Heat Supply

Heating the AWPP would be accomplished using hot water supply that is generated at Combined Heat and Power Plant 4 and provided by the Ulaanbaatar City Heating Company. Currently, independent of the BWSE, a project has been designed and construction is underway to provide hot water supply to the Auto Trade Park, located about 2 kilometers east of the site of the proposed AWPP.

The proposed AWPP hot water supply system would extend utility service from the Auto Trade Park to the AWPP. A new heat exchange station would be constructed at the Auto Trade Park, and a hot water/return loop would be constructed from the Auto Trade Park to the AWPP site boundary in the vicinity of the proposed AWPP access road. The infrastructure would comprise the new station with a heat exchanger, corrosion control system, and pumps, and the new, dedicated hot water/return loop, comprising a supply line to convey hot water to the AWPP and an associated return line to convey water back to the new station. At time of writing, the route of proposed heat supply loop has not been confirmed or decided.

### 5.1.4 Production Well Pump Houses

A total of 30 production well pump houses, 14 at Biokombinat and 16 at Shuvuun, would be constructed. A single design for all pump houses would be used to standardize construction, with individual pump houses varying only in terms of certain specifications, such as finished floor level and pump capacity. This would facilitate repairs and enable stockpiling fewer spare parts. Each pump house would be installed on a raised earth embankment to protect the structure and equipment from flooding of the Tuul River.

Flood analysis in the Tuul River floodplain in correspondence of the Biokombinat and Shuvuun wellfields was carried out with a HEC-RAS flood elevation model, considering a 100-year flood event, with a discharge flow of 1,580 cubic meters per second. Flood elevations with respect to ground level were higher at Biokombinat, reaching a maximum of 1.8 meters above grade, than in Shuvuun, where maximum flood elevations were estimated as 1.2 meters above grade. The difference in flood elevation estimates is consistent with expectations, given the wider valley floor at Shuvuun, which increases flood attenuation and volumes of water that can be contained. The finished floor elevations of the well pump houses are designed on the basis of the flood elevation analysis, allowing for a safety factor according to Mongolian requirements and best international practice (AECOM, 2020d).

Each production well pump house would include the following:

- Variable-speed submersible pump
- Air/vacuum release valve
- Check valve
- Flow meters
- Surge suppression tank and controls
- Manual blow-off valve
- Isolation valves
- Electrical room (with control panels)
- Transformer (external)

Each well pump motor would be driven by a variable frequency drive. The well pump discharge head, mechanical equipment, surge tank, and piping would be housed in a single pump room. All pump motor control centers and variable frequency drives would be housed in a separate electrical room. The pump room and electrical room would each have access to the exterior.

Access would be large enough to allow removal of mechanical and electrical equipment. A removable roof hatch would be provided above the well pump to facilitate pump and column removal, and well servicing.

The individual well pumps would pump their discharge to two systems of raw water transmission branch pipelines, one located on each wellfield, and then to individual raw water transmission main pipelines to carry the water from each wellfield to the AWPP.

## 5.1.5 Pipelines

The BWSE project would install approximately 55,000 meters of transmission pipelines, comprising the following:

- Biokombinat wellfield raw water transmission branch pipelines
- Shuvuun wellfield raw water transmission branch pipelines
- Biokombinat raw water transmission main pipeline to the AWPP
- Shuvuun raw water transmission main pipeline to the AWPP

Dual finished water transmission main pipelines from the AWPP to the USUG water distribution network

Proposed transmission pipelines would be sized to deliver up to the maximum wellfield capacity at the ultimate buildout condition. All transmission pipelines would be installed using ductile iron cement lined pipe. Approximately 21,000 meters of the pipelines would be installed in the Tuul River floodplain, with high groundwater at 1 to 2 meters below grade. In other areas, the pipelines would be installed along major highways or access roads, and the remaining pipelines would be in open country.

Due to the length and severity of winter in Mongolia, and consistent with Mongolian requirements, the standard practice is to bury water pipes below the potential frost depth to avoid pipeline freezing. Based on Mongolia measurements and standards, because of the extreme low temperature conditions with a design low temperature equal to -40 degrees Celsius (°C), frost depths in the project area vary between 2.50 and 4 meters below grade, as reported in the Geotechnical Investigation Report (AECOM, 2020c). Further, based on cold region air freezing index<sup>22</sup> calculations and an evaluation of over 30 years of minimum and maximum daily temperatures in UB, the equivalent maximum annual air freezing index for UB is approximately 3,300°C-days. These calculations suggest freezing depths are consistent with those provided in the (AECOM, 2020c) prepared according to Mongolian standards. Pipeline design for the BWSE considered these low temperatures and frost depths, as well as the location-specific depths of the water table<sup>23</sup>.

### 5.1.5.1 Pipeline Installation

#### 5.1.5.1.1 Areas of High Groundwater

On both proposed wellfield sites and along some portions of the proposed transmission main pipeline routes, groundwater is about 1 meter below existing grade. AECOM evaluated the following three alternative methods for installing the piping in areas of high groundwater:

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<sup>22</sup> The air freezing index is defined as the integral of the sinusoidal air temperature variation during one year for temperatures less than 0°C (Symon et al., 2005).

<sup>23</sup> The water table is the upper surface of an unconfined aquifer at atmospheric pressure.

- **Deep Trench** – Excavate below grade and install piping to provide 3 to 4 meters of earth cover to prevent freezing
- **High Embankment** – Install the piping just to the top of the groundwater and construct earth embankments on top of the pipelines to prevent freezing
- **Insulation and Low Embankment** – Install rigid polystyrene insulation over the top of pipe and possibly the sides of the trench to prevent freezing while reducing the depth of earth cover above the pipe

Using the **deep trench method**, the bottom of a 900-millimeter pipeline would be placed 5 meters below grade, as the pipeline must be covered with 4 meters of earth to prevent freezing. Therefore, in areas along the Tuul River aquifer where groundwater is 1 meter below grade, the local groundwater level would need to be lowered about 4 meters during construction.

As the soil is very permeable, water would flow very quickly through the porous material, and controlling groundwater at these depths could only be done using a well pointing system. With this system, well points would be driven alongside the trench to be excavated, connected to a pumping system with piping above grade, and pumped continuously during trench excavation and pipe installation. As the well points are pumped and the groundwater is lowered, the pipe trench would be excavated and the pipe installed using a trench box to provide earth stability. As long as the trench is open for construction, the well point system would require pumping.

This would be a very costly operation, requiring electric generators to power pumps and discharge piping to carry the pumped flow away from the construction site. The operation also would require a location to discharge the flow at least 200 meters from the construction zone.

The **high embankment method** would involve installing the bottom of the pipe at the water table and constructing an earth embankment over the pipe to provide frost protection. If groundwater and the bottom of a 900-millimeter pipe were 1 meter below grade, then the earth embankment would extend 4 meters above the top of the pipe and existing grade. With side slopes constructed at a 3:1 slope, the embankments would require about 60 cubic meters of soil per linear meter of pipeline to provide the needed 4 meters of cover. High embankments to protect water pipelines from freezing in areas of high groundwater have been used successfully in and around UB.

However, high embankments within the wellfields and elsewhere along the Tuul River floodplain would be barriers to river flood flows. The embankments would stop or restrict the flows and could cause river levels to rise higher than the normal or previously experienced floods in some areas. To minimize obstruction to flood flows and minimize ponding, pipelines from each well pump house and their embankments would be angled downstream relative to the flood flow direction. In floodplain areas, to prevent erosion by flowing water, including when the low embankments may be overtopped during large magnitude, low frequency flood events, the embankment top and side-slope surfaces would be armored with stone riprap.

High embankments also would pose restrictions to USUG service vehicles that would need to cross the embankments to travel to each well pump house, for equipment maintenance during routine operations and during emergencies. Access across the embankments also would be needed for large well service rigs and possibly heavy construction equipment. As these larger vehicles cannot navigate the steep grades that would be required for ramps over the embankments, at-grade crossings would be constructed. At these crossings, the embankments would end, and the pipeline would be buried to provide 4 meters of earth cover.

With the **insulation and low embankment method**, earth cover in trenches and/or earth embankment height could be reduced by insulating the pipe trench above the pipe barrel with rigid polystyrene XPS insulation across the top of the pipe and possibly down the sides of the trench. The insulation is impervious to water and once buried would have long service life. This approach has been used successfully in other extreme cold climates, including in Alaska and

Canada. A minimum of approximately 1.5 meters of earth cover would be required above the top of the insulation to protect it.

An advantage of this method is that, in areas of deep groundwater, the pipeline would be installed to shallower depths with no embankments; whereas, in areas of high groundwater, the pipeline would be installed to the top of groundwater, the trench would be insulated, and a minimal embankment would be installed. This would significantly reduce excavation costs, dewatering costs, and embankment costs. Although dewatering may still be required, depending on the location and season, the dewatering volumes would be greatly reduced.

Further, compared to high embankments, the low embankments constructed in high groundwater areas would cause substantially less obstruction of flood flows, and less deep and shorter duration ponding. Similarly, low embankments would be less restrictive impediments to crossing by USUG service vehicles, service rigs, and heavy construction equipment, as at-grade crossings or low-angled ramps would be more easily constructed.

The low embankments would be sized on the basis of flood flow and elevation modeling, the same as described in section 5.1.4 for sizing well pump house elevations. The low embankments would be sized to be higher than a 100-year flood event, as water flowing across the top of them would cause erosive damage. The design includes a series of at-grade openings along the embankment network to allow flood waters to flow easily downstream. These would be protected against erosion and sediment transport by large-stone rip rap armoring and, in correspondence of the opening, the underlying pipeline would have increased thickness of insulation installed to protect it from freezing in extreme winter conditions (AECOM, 2020d).

#### **5.1.5.1.2 Selected Pipeline Installation Methods**

In areas of high groundwater on the proposed Biokombinat and Shuvuun wellfield sites, and along the proposed transmission main pipeline routes, piping would be installed using the insulation and low embankment method described above. To provide access across the pipelines and to allow flood waters to flow normally with no change in flood elevation, in areas of high groundwater several access/flood passage pipeline sections would be installed without embankments. In areas without high groundwater, piping would be installed using the deep trench method. In total, there are 17 typical trench cross sections for pipeline installations. Figure 5-4 presents some examples of typical cross-sections employing the insulation and low embankment method and the deep trench method. The complete set of typical trench cross sections are shown in Appendix K.

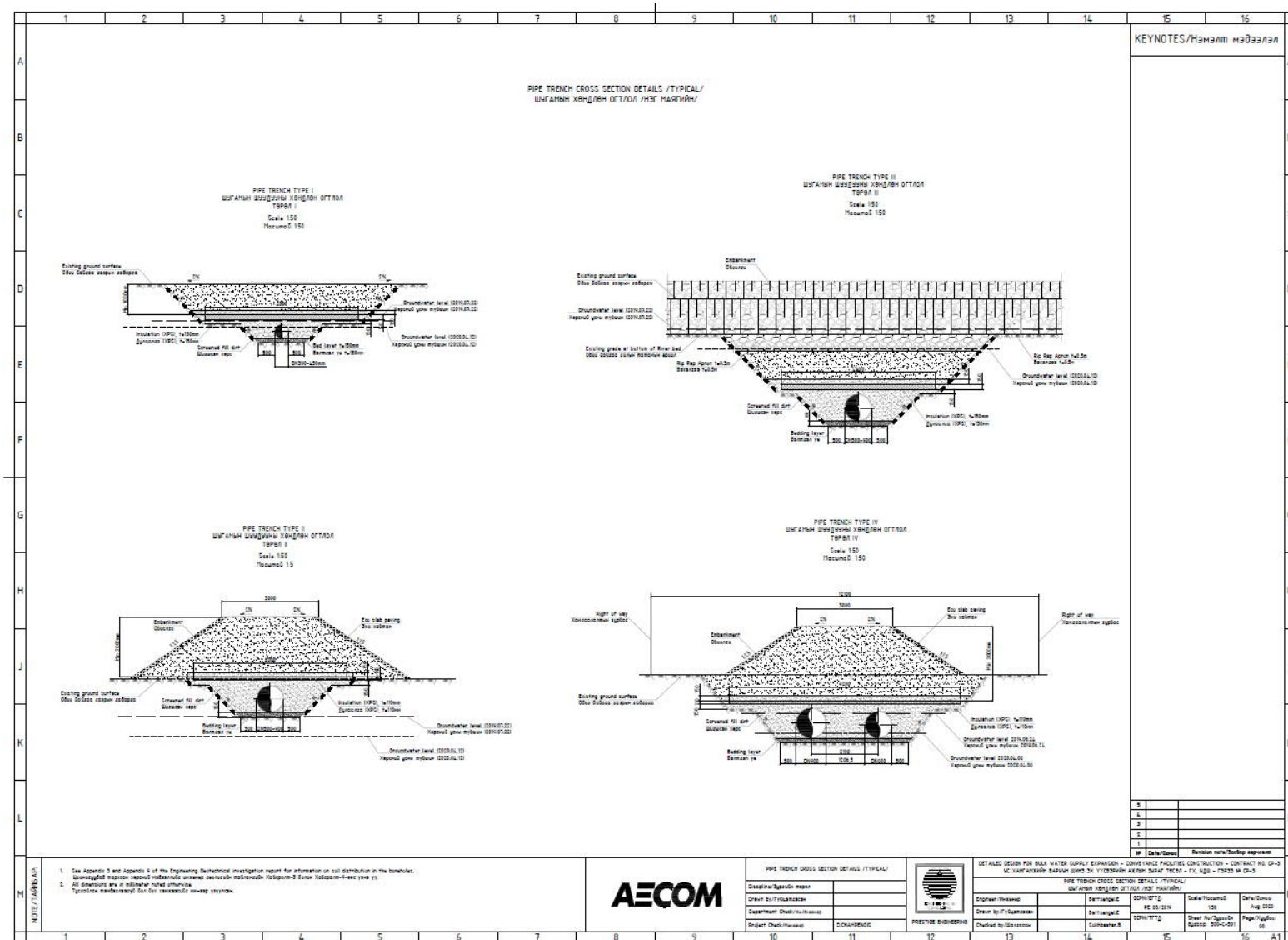


Figure 5-4 Typical Cross-sections

This combination of methods was selected to optimize preventing freezing of transmission branch and main pipelines, especially in areas with high groundwater, maintaining access across the pipelines, avoiding the restriction of flood flows and associated increased flood levels along the Tuul River, and controlling construction costs. Table 5-6 summarizes the typical pipe trench sections in terms of the following:

- Depth to which the crown of the pipe will be buried below existing grade
- Thickness of polystyrene XPS insulation across the top of the pipe
- Height of embankment above the existing ground surface
- Thickness of stone riprap on embankment top and side slopes in floodplain areas

**Table 5-6 Typical Pipe Trench Sections**

Trench Section	Pipe Diameter (millimeters)	Pipe Depth (meters)	Insulation Thickness (meters)	Embankment Height (meters)	Riprap Thickness (meters)
<b>High Groundwater Areas</b>					
<b>Standard</b>	600 to 900	1.45	0.10	2.0	0.25
<b>Access/Flood Passage</b>	600 to 900	1.45	0.18	None	None
<b>Standard</b>	300 to 500	1.85	0.125	None	None
<b>Deep Groundwater Areas</b>					
<b>Standard</b>	300 to 1,000	4.00	None	None	None

Where the pipeline would cross a river branch or flow channel, it would not be feasible to install the pipe using open-cut methods. In these locations, the pipeline would require installing a jacked sleeve (or in some cases two sleeves for the dual finished water main pipelines), in which the pipeline would be carried under the waterway. In the approaches to the jacked sections, the embankments would end, and the pipes would be installed deeper to reach the depth of the jacking pits located at each end of the jacked sleeves. Groundwater would need to be lowered using a well pointing system to allow construction of the jacked crossings and concrete valve vaults.

### 5.1.5.2 Raw Water Branch Pipelines

Figure 5-5 and Figure 5-6 provide an overview of proposed raw water branch pipeline layouts for the two wellfields, as well as the proposed well locations.

Wellfield pipelines were sized using hydraulic modeling software, with inputs including the design pump rates (71 liters per second at Biokombinat and 74 liters per second at Shuvuun) and the proposed branch pipeline system layouts to connect the wells to the raw water transmission main pipelines to the AWPP. The resulting proposed pipeline diameters range from 300 to 900 millimeters.

### 5.1.5.3 Raw Water Main Pipelines

Two raw water transmission main pipelines would deliver water from the Biokombinat and Shuvuun wellfields to the proposed AWPP. AECOM undertook alternative analyses to evaluate raw water main pipeline route options, considering the following factors (AECOM, 2020b):

- Construction and operating costs
- Groundwater conditions
- Rock excavation requirements
- Requirements for pipe jacking under highways, river courses, and railroads
- Environmental impacts

- Resettlement impacts
- Potential easements across private lands and mining lease areas

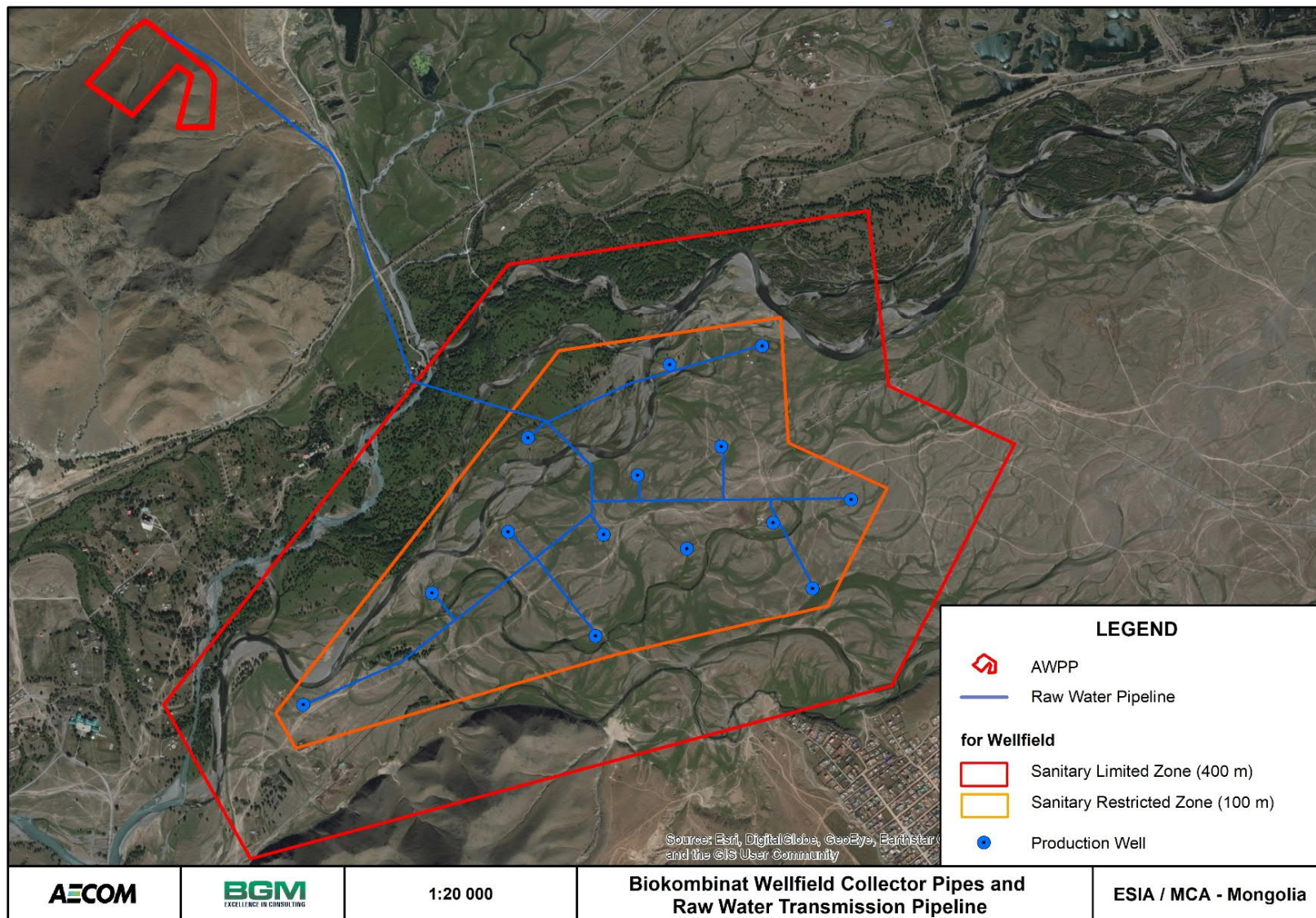
The alternative analysis for the raw water transmission main pipeline route from the proposed Biokombinat wellfield to the AWPP evaluated two routes, comprising a shorter, western route and a longer, eastern route. The selected option was the shorter, western route, as this option would require a shorter length of pipeline and would have a lower operating cost. The approximately 2.8-kilometer route would require jacking under the river at four locations for an estimated total of 143 meters, and under a railroad at one location for an estimated 45 meters. The Municipality of Ulaanbaatar (MUB) Route Approval Committee—consisting of MUB department representatives, including the Land Agency, Road Agency, and Power Distribution Network—approved the route in December 2019.

The alternative analysis for the raw water transmission main pipeline route from the proposed Shuvuun wellfield to the AWPP evaluated the following four routes:

- Predominantly along the highway from Shuvuun to Biokombinat east of the Tuul River
- Along existing water transmission pipeline embankment and roads east of the river
- Along the railway west of the river
- Along dirt and improved roads initially west of the river and turning inland through Songinokhairkhan

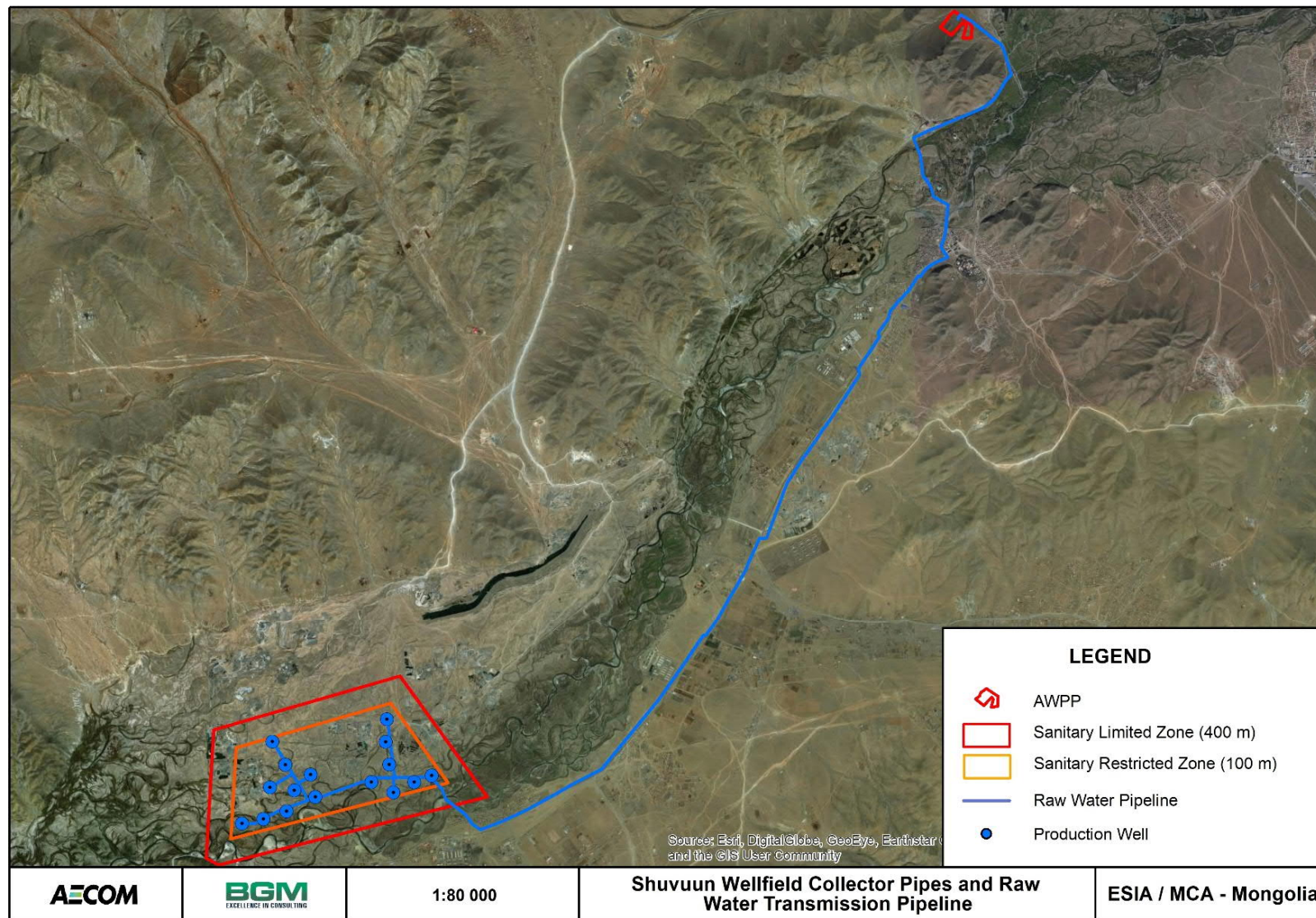
The selected option was the approximately 20-kilometer route generally along the highway from Shuvuun to Biokombinat, with the advantages of following the highway that could be used as a service road and having a relatively favorable depth to water table (3.0 to 3.5 meters deep). The route would require jacking under the river at three locations for an estimated total of 367 meters, under the highway at six locations for an estimated 128 meters, and under a railway at one location for an estimated 39 meters. The MUB Route Approval Committee approved the route in December 2019. Figure 5-5 and Figure 5-6 show the routes of the two proposed raw water main pipelines. Since their approvals, both the Biokombinat raw water transmission main pipeline route and the Shuvuun raw water transmission main pipeline route have been modified to stay outside the property boundary of the proposed gold processing facility, adjacent to the site of the proposed AWPP, and to follow in part the future Tuul River Highway right-of-way. The diameters of both proposed raw water main pipelines would be 900 millimeters.





**Figure 5-5 Biokombinat Wellfield Collector Pipes and Raw Water Transmission Pipeline**





**Figure 5-6 Shuvuun Wellfield Collector Pipes and Raw Water Transmission Pipeline**

#### 5.1.5.4 Finished Water Main Pipelines

Finished water would be pumped from the proposed AWPP finished water pump station to the existing USUG distribution network via dual, parallel transmission main pipelines, consistent with Mongolian regulations on redundancy of sensitive infrastructure. The proposed finished water pumps at the AWPP and finished water main pipelines are sized to deliver up to 1.25 times the maximum daily purification capacity at the ultimate buildout condition of the AWPP, which is the maximum day demand ratio for the USUG network. The AWPP finished water pumps would provide 8 bars (800 kilopascals) of delivery pressure. A pressure control station would be included at Orbit Junction so that, should USUG lower service pressures in the future, the delivery pressure can be reduced accordingly at the station.

AECOM undertook an alternative analysis to evaluate finished water main pipeline route options. The analysis considered the same factors as specified above for the raw water main pipeline route analysis, as well as an additional factor that evaluated the ability to provide convenient connections to future population centers through additional connections to the USUG network.

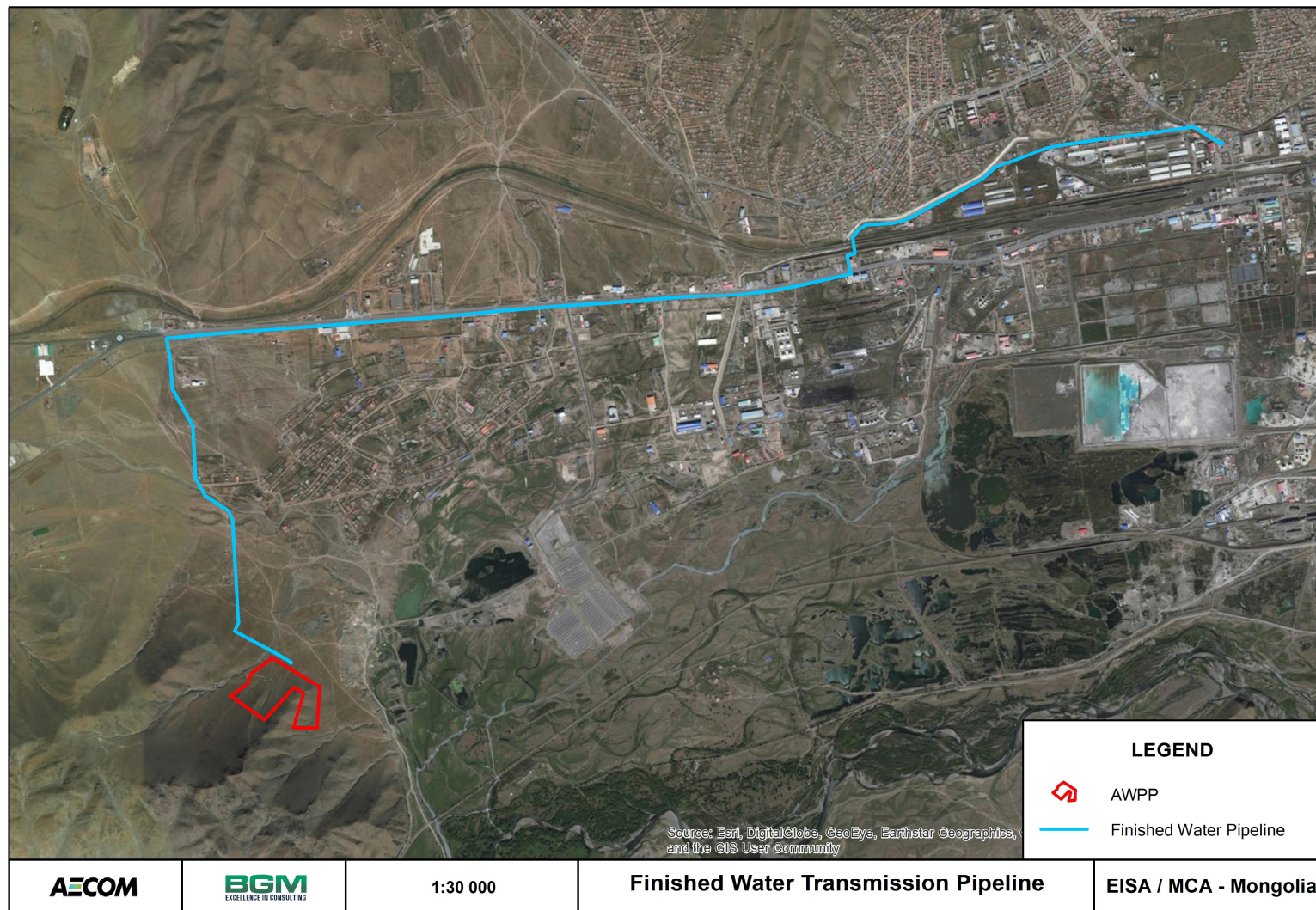
The alternatives analysis evaluated three route options; two routes along the existing highway AH3 from the western provinces along substantial portions of their alignments, and one, more northern route along the existing railroad from Selenge and Darkhan province. Although the longest route, the initially recommended option was the approximately 9.6-kilometer northern route along the railroad, as this option was expected to have less impacts on development along highway AH3 and would require less jacking.

However, the owners of Ulaanbaatar Railways would not accept the proposed route in railroad right-of-way or allow installation of the pipelines in the protection zone north of the right-of-way. Further discussion with stakeholders led to the subsequent selection of routing the pipeline in the highway AH3 right-of-way. The selected, approximately 9.3-kilometer route would require jacking under roads at five locations for an estimated 162 meters, under the railway at two locations for an estimated 92 meters, and under an existing flood channel at two locations for an estimated total of 64 meters. The MUB Route Approval Committee approved the route in May 2020. Figure 5-7 shows the route of the proposed dual finished water main pipelines.

Construction under MCA-Mongolia funding would physically connect to two existing facilities: the Orbit Booster Pump Station and a 600-millimeter pipeline that has not been commissioned but would serve western areas of UB. In addition to these proposed MCA-funded connections, the dual finished water main pipelines also would include six additional connection points along the route to facilitate tie-ins to future pipelines for anticipated city and USUG network expansion, and to comply with the UB City Water Masterplan. Connections to these future pipelines also would be needed for the network to receive the full production capacity of the AWPP. However, these future pipelines are not part of the BWSE project. Based on development and increased demand on the west side of UB, MUB would determine the timing of the commissioning of the future pipelines, as well as the commissioning of the existing 600-millimeter pipeline.

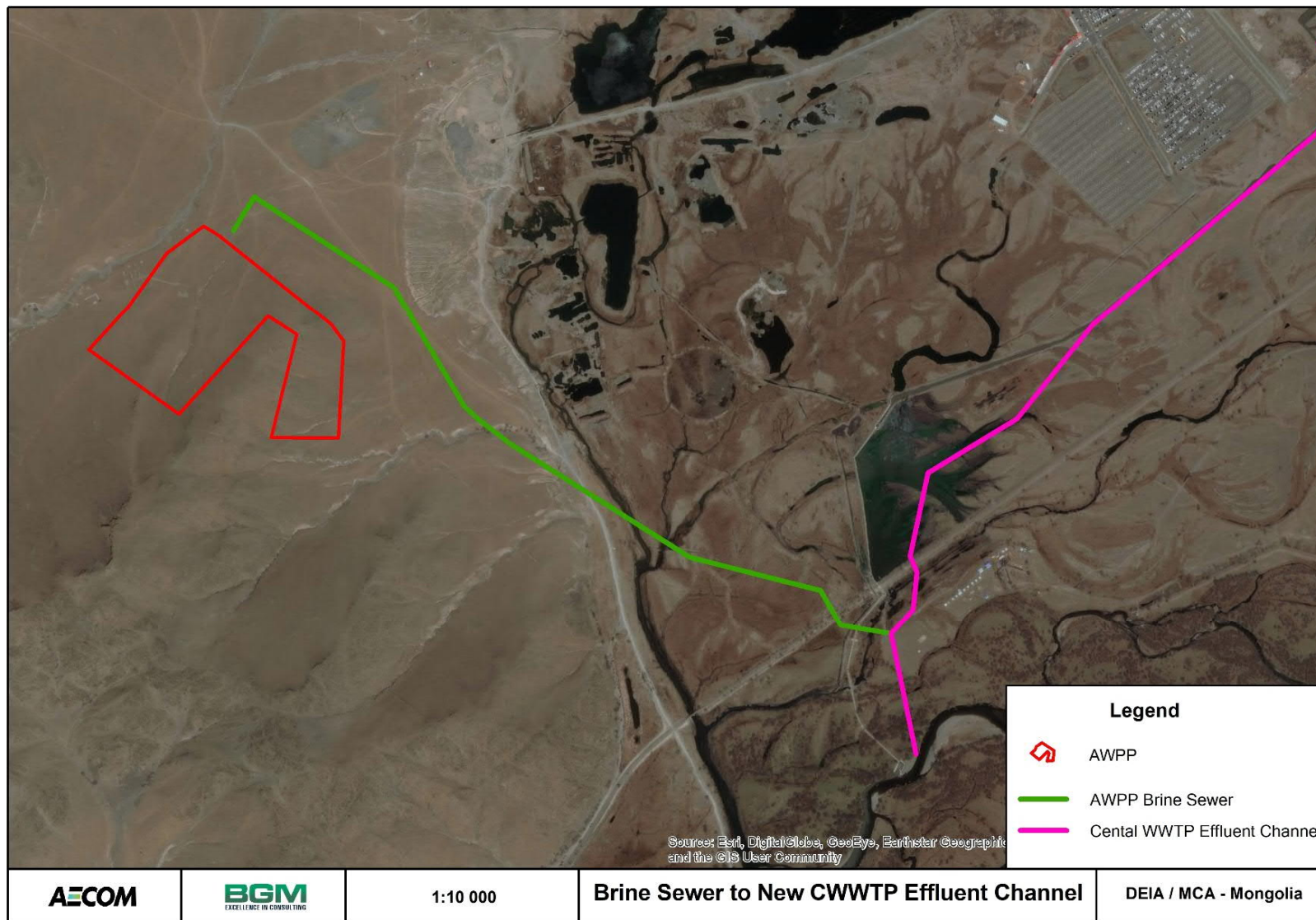
The diameters of proposed dual, finished water main pipelines would be 1,000 millimeters between the AWPP and the first connection point. As demands at the connection points along the route of the transmission main would reduce the rate of water flowing through the pipelines, the diameters of the dual pipelines would decrease progressively to 900, 800, and 700 millimeters between the AWPP and the final connection at the Orbit Junction connection.





**Figure 5-7 Finished Water Transmission Pipeline**





**Figure 5-8 Brine Sewer (green) to New CWWTP Effluent Channel (pink)**

## 5.1.6 Access Roads

Construction, and operation and maintenance access to the proposed Biokombinat and Shuvuun wellfields and the AWPP would be provided using existing roads and bridges where feasible. Personnel, vehicle, and equipment access would be critical to the construction, operation, inspection, and maintenance of the project facilities.

Construction crews, and wellfield and AWPP operators and security staff would require access on a daily basis. Vehicles for service, maintenance, and supply would require daily, weekly or monthly access. Access roads also would provide emergency access for maintenance, repair, and emergency spill, fire, or medical response to incidents at the wellfields or the AWPP, or along the pipelines.

### 5.1.6.1 Wellfields

The proposed Biokombinat and Shuvuun wellfield sites generally are accessible along existing roads. Access to wellfields from UB, during construction and long-term operations, would be along the main airport highway, before continuing along the main road to Shuvuun Fabrik village, from where existing dirt roads to the wellfields branch off. Access from the AWPP would be across the Tuul River floodplain along an existing dirt road to Biokombinat village and there along the main paved road to Shuvuun Fabrik village, from where existing dirt roads to the wellfields branch off. In times of more difficult conditions, such as heavy rains, AWPP staff can access the airport highway via a longer paved route and then continue as those travelling from UB.

The existing dirt roads would be graded where necessary using cut and fill methods. Culverts would be constructed in specific locations to allow surface water drainage and avoid restricting the movement of flood waters along the floodplain. This would facilitate the transit of vehicles, particularly construction vehicles and heavy equipment during construction and extraordinary maintenance, even during ordinary rain events.

### 5.1.6.2 Advanced Water Purification Plant

The access road to the AWPP would extend 2.5 kilometers from the AH3 highway, following the same route as the dual finished water main pipelines. Initially it would be constructed as a gravel road for use during construction and then would be paved with asphalt before completion of construction, as required by the MUB Roads Department. Figure 5-9 shows the route of the proposed AWPP access road.

In the vicinity of the AWPP entrance, the proposed access road would accommodate the proposed Tuul River Highway, a beltway road project that will run from Nalaikh, east of UB, to the Darkhan Highway in the west. The highway has been designed and approved; however funding has not been obtained and construction has not begun. The AWPP access road would not interfere with the approved design of the highway and it is expected that, before construction of the Tuul River Highway, the highway design would be modified to provide access to the AWPP via on and off ramps.

### 5.1.6.3 Monument and Sacred Owoo

Grading of the AWPP site would eliminate an existing dirt trail that provides access to the Monument to Terror Victims, Mount Songinokhairkhan, which commemorates the execution in 1937 of the first group of political prisoners, in this instance monks, among the victims of purges that culminated in the second half of the 1930s. Further uphill is an owoo, or magnificent shrine, which is constructed of stones and tree branches, decorated with colorful prayer flags and silk. The owoo is symbolic of a deity in Mongolian shamanism, recognizes the sacredness of Songinokhairkhan Mountain, and is a site for worship and ceremonies.

On March 20, 2020, MCA-Mongolia met with Songinokhairkhan District authorities to discuss the location of the AWPP and local concerns regarding access to local cultural heritage sites. These concerns, and their potential remedies subsequently were raised with AECOM and local designers during discussions in April 2020. MCA-Mongolia later provided the following written explanation and instruction to AECOM:

- MCA-Mongolia discussed and agreed with Songinokhairkhan District CRK [Citizens' Representatives' Khural] and in accordance with IFC Performance Standard 8-Cultural Heritage, an access road to the sacred ovoo and landscaping plan need to be designed allowing a continued access to the sacred ovoo subject to overriding health, safety and security considerations. Thus, these designs must be reflected in the detailed design of AWPP and relevant ESMP accordingly.
- Improve the existing earth road to improved dirt road.
- Provide safety measures such as installing road poles or metal protection on the ravine side. It was learned that number of accidents did occur that vehicles slide to the ravine when road is slippery and not visible.
- Create "natural car parking slot" northwest of AWPP parcel.

[from Comments to 60% detailed design, May 6<sup>th</sup>, 2020]

The prescribed provision of access improvements envisioned by MCA-Mongolia and Songinokhairkhan District, must be evaluated in light of the continued access provision of IFC Performance Standard 8 and anticipated adverse impacts of these improvements to the Mongolian marmot (*Marmota sibirica*), a globally and regionally endangered species present and with critical habitat upgradient from the monument. Because provision of the improvements suggested by MCA/District would be anticipated to result in adverse impacts to the marmot that would contravene provisions of IFC Performance Standard 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources, the design was developed to minimize the impacts while still achieving the project purpose.

The design evaluated in this ESIA replaces the existing dirt trail to the monument with a gravel road and pedestrian path, establishes a natural car parking area at the monument, and provides a walking trail that traverses southward across the western portion of the AWPP site from the monument to a juncture with the existing trail to the ovoo. Figure 5-10 illustrates the concept plan for the proposed access road, walking trail, and associated facilities.



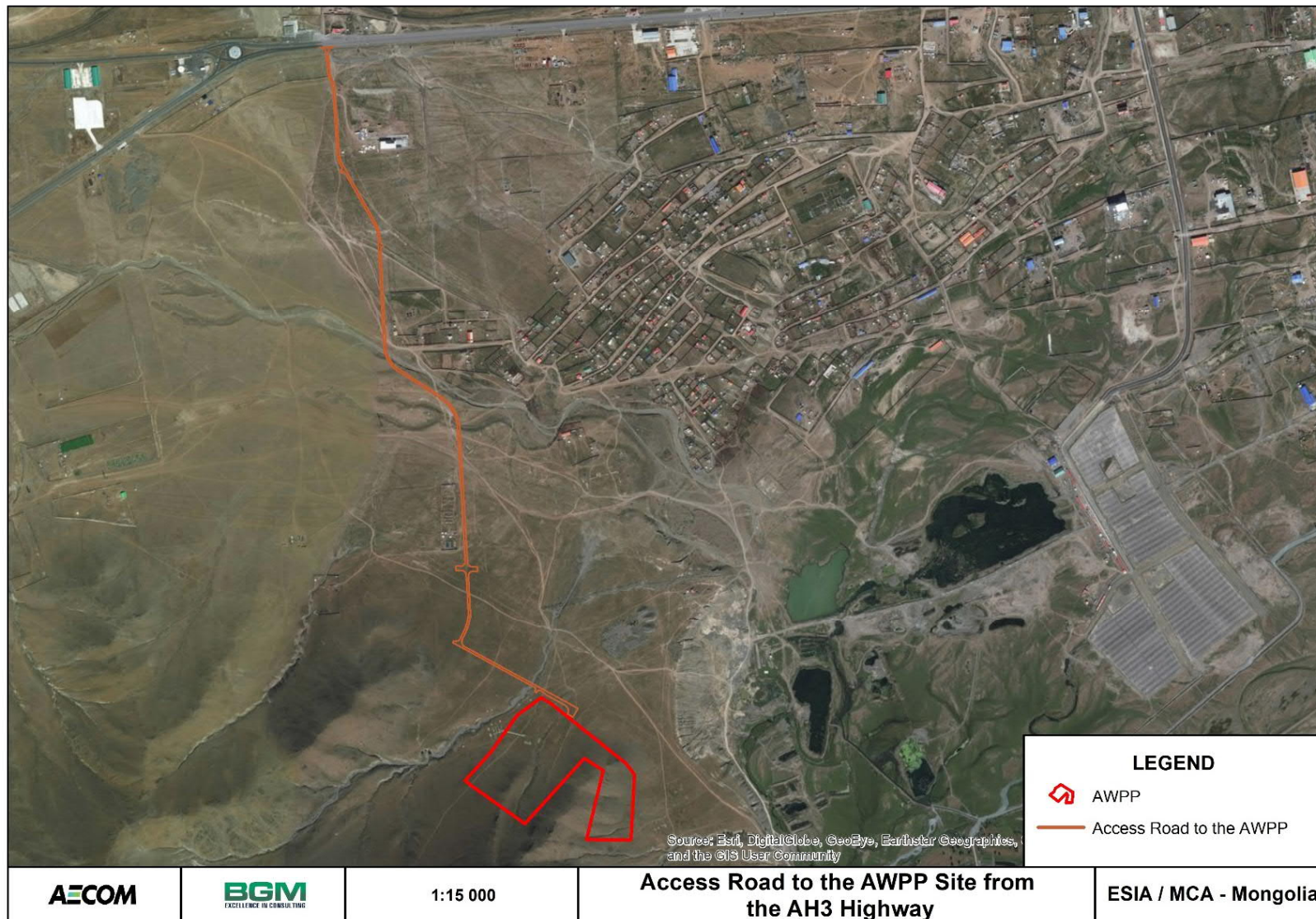
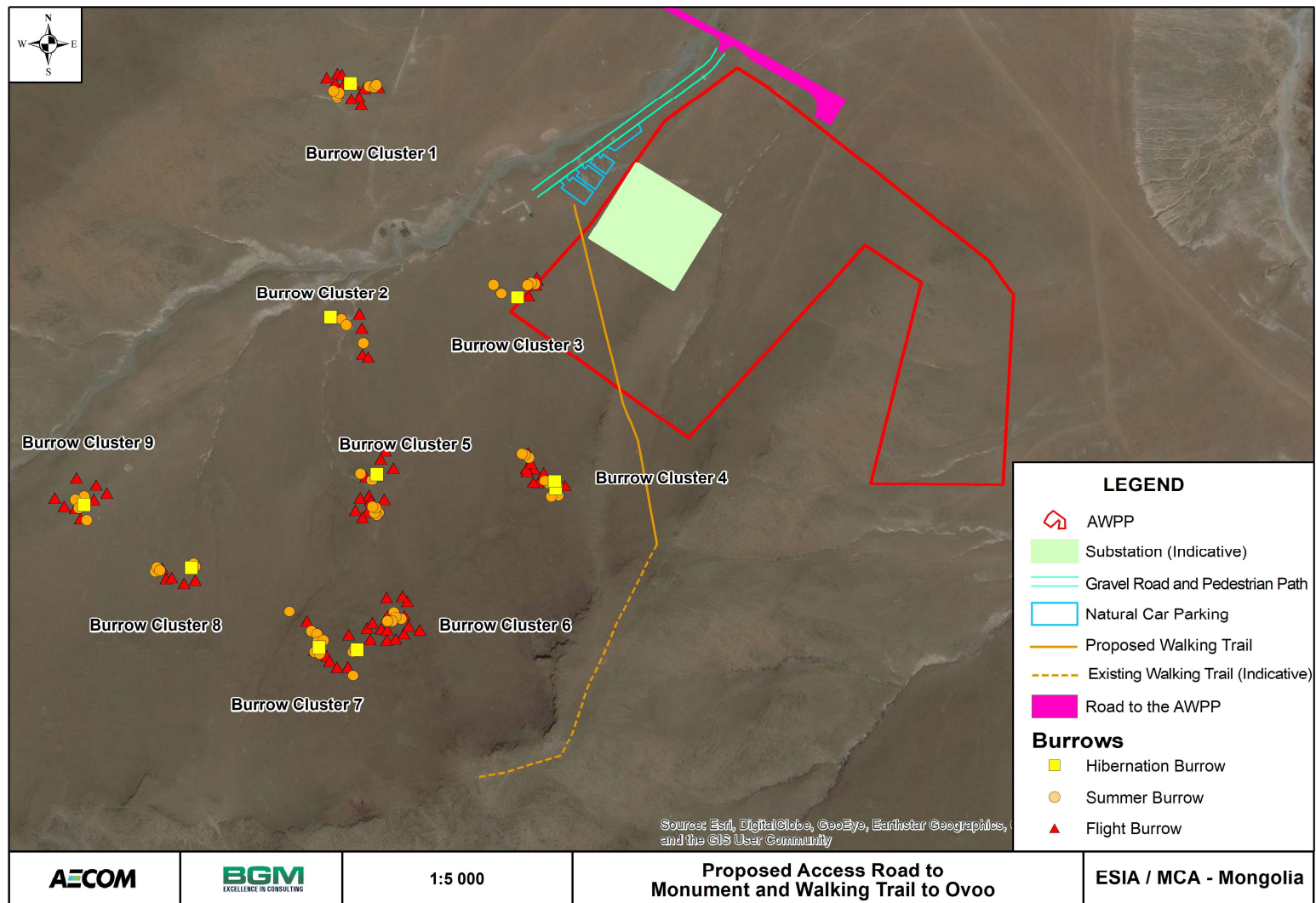


Figure 5-9 Access Road to the AWPP Site from the AH3 Highway



**Figure 5-10 Proposed Access to the Monument and Ovoo**



## 5.1.7 Temporary Construction Facilities

As required by the construction contractors, temporary construction-related facilities would be established and used during the construction phase. The locations, size, and operational conditions and controls of the facilities would be contingent on the approval of MCA-Mongolia prior to the initiation of construction. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The operation of the temporary facilities would be variable according to the construction schedule and construction activities carried out within that timeframe. The facilities would be required to operate consistent with relevant government permits/licenses and requirements. Site constraints due the linear nature of the pipelines and associated infrastructure, and the limited size of the AWPP site indicate that temporary facilities could occupy land not permanently designated to the project. While this may give opportunity to local landowners to provide paid-for services to contractors, it can also be a source of environmental and social impacts and altercations with local communities and stakeholders. All temporary facilities, both inside and outside of project designated land, should be presented to the Owner or Owner's representative for agreement and approval.

The technical specifications to be provided to the contractor as part of the contract documentation include a number of specifications relating to environmental protection, rehabilitation and cleanup. These would apply to both permanent and temporary structures.

The size and duration of temporary facilities are unknown at time of writing; they would be proposed by the contractor, in consultation with MCA-Mongolia and its representatives, under what is commonly referred to as contractor's means and methods. It is expected that size and timescale of temporary facilities would vary depending on facility type and function, size of work force, and security of supply chain identified by contractor, for example.

### 5.1.7.1 Construction Camps

It is anticipated that construction camps would be built, equipped, and staffed to be self-sufficient to the extent possible. As determined by the construction contractors and approved by MCA-Mongolia, construction camps would include on-site accommodation facilities and related facilities to serve the needs of the construction workforce, such as cafeterias, medical rooms, showers and toilets, and entertainment. These facilities would be provided with required services, such as power, heat, water supply, and waste disposal. Liquid and solid waste would be disposed of according to local legal requirements (e.g., package wastewater treatment plants, regular removal of trash). Site security would be provided to protect and safeguard facilities and equipment from outsiders, and to promote legally acceptable social behavior of the workers.

The contractor would be required to develop, as part of the contract-specific ESMP and Health and Safety Management Plan, guidelines and rules for living and visiting construction camps that would help provide satisfactory living and working conditions for all workers and foster legally and socially acceptable relations between workers and the local community. These rules could include timetables for visitors, limits or bans on alcohol, and, in light of the global pandemic, health

controls and isolation units – more detail of these aspects could be provided in a Covid-19 mitigation plan that would be prepared by the contractor.

### **5.1.7.2 Laydown, Staging, and Storage Sites**

The adequate storage of materials and equipment would be required of the contractor in order to guarantee integrity and quality at the time of installation and use. The contractor, in storing material and equipment, would be required to protect the environment from erosion and contamination (e.g., spill control and containment, control of modified runoff) and rehabilitate the sites after use. The storage of large quantities of construction materials and equipment represents a physical danger to untrained people and an economical risk to the project. The storage and staging sites would be required provide adequate security to stop unauthorized access, whether accidental or intentional.

### **5.1.7.3 Other temporary facilities**

Other temporary facilities would be subject to the same requirements as the other temporary facilities, specifically in terms environmental protection and post-hoc rehabilitation. Many of these temporary facilities would be specific in their function (e.g., concrete batching, rebar preparation, machine shops, and fueling stations) and would be each subject to specific legal, contractual, and environmental requirements and regulations.

## **5.1.8 Power Supply**

### **5.1.8.1 High Voltage Power**

Although the National Dispatcher Center in July 2019 issued calculations determining that 35-kilovolt power from Songino electrical substation would be adequate to supply all BWSE facilities, on October 9, 2019 the Ministry of Energy (MoE) issued a technical condition that requires a much more extensive high voltage power supply system. Specifically, the technical condition requires the following:

- 23.8 kilometers of new power transmission lines, comprising 18.3 kilometers of 110-kilovolt and 5.5 kilometers of 35-kilovolt lines
- Rehabilitation or replacement of two existing 14.5-kilometer 35-kilovolt lines
- New 110/35/10-kilovolt electrical substation at the AWPP
- New 110/35/10-kilovolt electrical substation at the proposed Shuvuun wellfield
- Extension of existing 35/6-kilovolt electrical substation in Shuvuun

Fiber optic cables for high voltage power supply automation also would be installed on proposed overhead power transmission lines.

Electrical power would be provided to the BWSE as follows:

- The existing Songino electrical substation, which has been constructed and recently commissioned (November, 2020), would provide electrical power to the AWPP via proposed 110-kilovolt power transmission lines to the proposed 110/35/10-kilovolt substation at the plant.
- A new 35-kilovolt transmission line would be constructed between the 35-kilovolt line at the Emeelt Industrial Park and the proposed substation at the AWPP.
- Power would be supplied from the Songino electrical substation to the proposed 110/35/10-kilovolt substation at the Shuvuun wellfield via proposed 110-kilovolt power transmission lines.

- A 35-kilovolt connection would be constructed from the Songino substation to an extension of an existing 35/6-kilovolt substation in Shuvuun.
- The existing 35-kilovolt power transmission lines from the existing 35/6-kilovolt substation at Combined Heat and Power Plant 4 to the existing substation in Shuvuun would be rehabilitated or replaced.

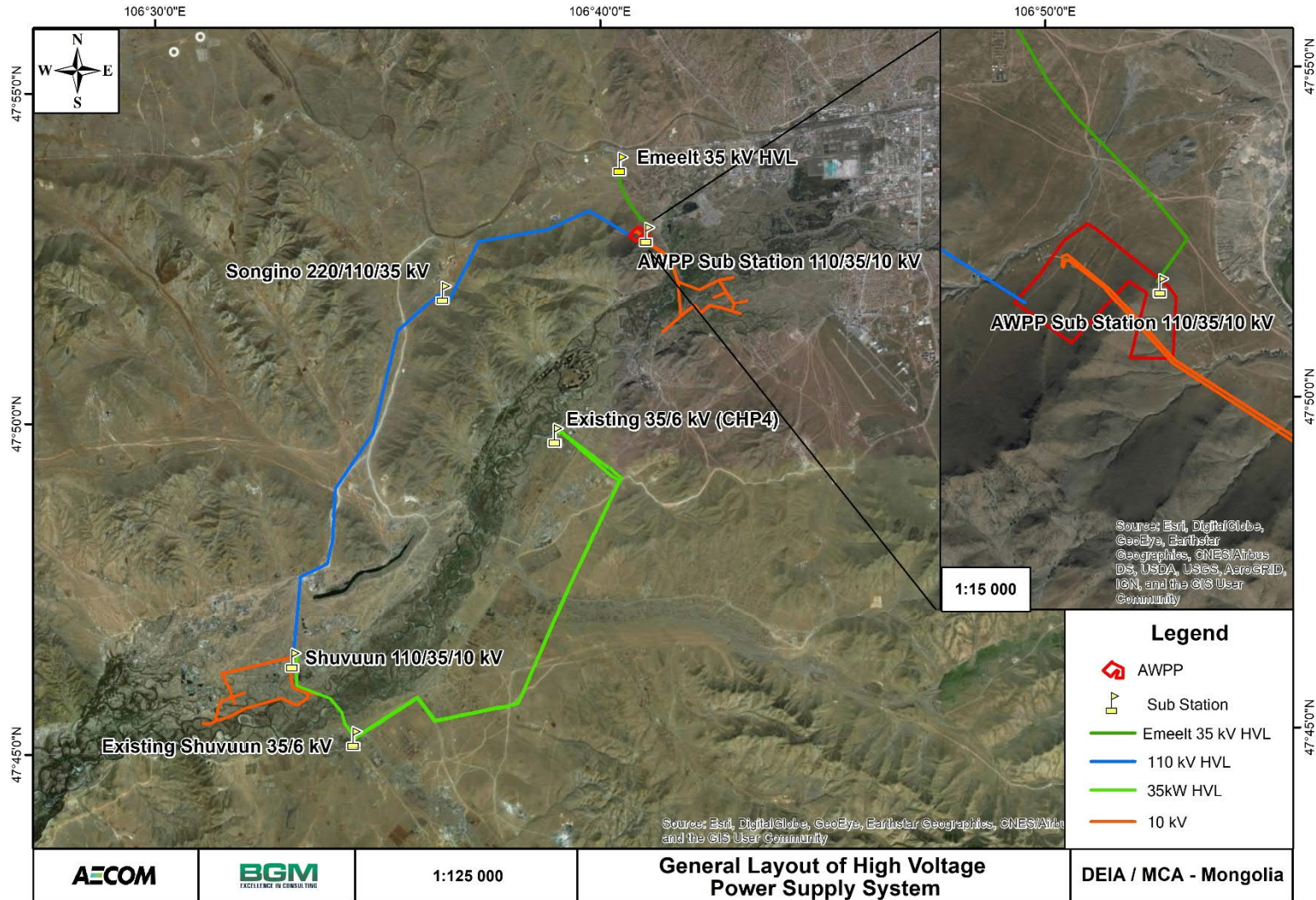
Figure 5-11 illustrates the general locations and conceptual routes of the high voltage power supply system required by the technical condition. It also shows the 10-kilovolt power transmission line from AWPP to the Biokombinat wellfield, and the 10-kilovolt power distribution systems in the Biokombinat and Shuvuun wellfields.

High voltage power supply construction would be financed by the Government of Mongolia, likely drawing on the funds that were committed under Compact II. Construction of the high voltage transmission lines and substations would be tendered under a separate construction contract package—see Section 5.2.

#### **5.1.8.2 10-kilovolt and Standby Power**

A proposed 10-kilovolt transmission line would supply electrical power to the Biokombinat wellfield from the new 110/35/10-kilovolt electrical substation at the AWPP; whereas, electrical power to the Shuvuun wellfield would be supplied from a transformer immediately outside the wellfield. A proposed 10/0.4-kilovolt step down transformer would be constructed at each well pump house. On both wellfields, 10-kilovolt distribution lines would supply power to each production well pump house and to the guard houses. Fiber optic cables for the supervisory control and data acquisition system also would be installed; buried with the proposed water transmission pipelines.

A 2-megawatt standby power generator at the AWPP would provide the non-process power requirements of the plant if the external power supply is interrupted. The diesel-fueled generator would support building services, such as lighting and heating, ventilation, and air conditioning, so that the plant can be occupied, but would not supply power for water treatment and residual handling processes.



**Figure 5-11 General Layout of High Voltage Power Supply System**



## 5.2 Workforce

In terms of workforce, the construction and operations phases of the BWSE project represent very distinct realities. The construction phase will be a hive of activity with hundreds of construction workers involved daily; the operations phase, on the hand, will require a much reduced number of specialized workers.

### 5.2.1 During Operations

As designer, AECOM has a very clear idea of the anticipated workforce required to operate the AWPP according to its design potential. Table 5-7 presents the anticipated workforce required to operate the AWPP. A minimum 11 workers would be on site during the first 8-hour shift, with fewer workers present during the remaining three shifts.

Table 5-7 AWPP Workforce

Position	Shifts per Day	Hours per Shift
Chief Operator	1	8
Electrical/Instrumentation and Control Technician	1	8
Janitor/Laborer	1	8
Administration Support	1	8
Chemist/ Lab Technician	1	8
Working Foreman	1	8
Maintenance Technician	2	8
Plant Director	1	8
Control Room Operator	4	8
Residual Operator	1	8
Operator for Remainder of Plant	4	8

Design of facilities accommodates women workers in terms of women-only spaces (i.e., bathrooms and changing rooms). The makeup of the workforce during operations would depend on availability of qualified personnel and operator policies, that are expected to align with UB and GoM policies on gender inclusion, as presented in Section 2.1.4.4.

In addition to the technical operations staff shown in Table 5-7, there will be three guard stations, one at each wellfield and one at the AWPP site, indicatively rotating four guards each, for a total of twelve guards. Ordinary and extraordinary maintenance at the wellfields and AWPP site would be managed by USUG with their pool of qualified technicians and would not constitute additional project-specific staff.

### 5.2.2 During Construction

In a design-bid-build project, such as is the BWSE, it is very difficult for the designer to anticipate construction staffing. Any given contractor could approach the construction task very differently, depending on the means and methods developed over the years of working on different projects in different contexts. With that said, an estimate of staffing is here provided, recognizing that, while it is a possible staffing plan, it is unlikely to be the one actually implemented by the contractors. For this reason, the level of detail is low as more detail could create the illusion of certainty.

The CP-1 contractor will need to drill and develop 30 wells at the Shuvuun and Biokombinat wellfields. A possible approach could be to use of 6 drilling rigs with 6 to 8 operating staff at

each. Including management staff, and engineers and hydrogeologists, one could assume a total of 50 technical staff as a good indication of staffing needs under this assumption.

The CP-2 contractor, in building and furnishing the AWPP, will require numerous staff qualified in different disciplines. For example: site excavation and civil work could require 25 laborers and machine operators; structures 35; architectural 20 for fittings, painting and finishing; electrical and mechanical could require a team of 30 qualified staff; treatment processes, 10; heating and ventilation, 15; plumbing, 10; instrumentation and control, 15; and pipework installation and welding 20. Including a management and engineering team of 20, the total staffing could be 200.

The CP-3 contractor will build out well houses and valve vaults and install in excess of 50,000 meters of pipeline, including a number of important locations where the pipelines will be jacked under rivers and railways. Given the broad extent of the contractors work area, it would seem reasonable to assume that the teams of would be implemented. For structures, including wellhouses and valve vaults, there could be 4 teams of 15; for embankments and earthworks, 2 teams of 10; for pipe installation, 4 teams of 20; and for jackings, 1 team of 20. Each team would include all required laborers and local oversight. Furthermore, for project management and oversight there could be 20 engineers and construction supervisors. Under these conditions, total staffing could be 200.

A summary of these broad construction staffing estimates is presented in Table 5-8.

**Table 5-8 Construction Workforce**

<b>Contract Package</b>	<b>Staff</b>
<b>CP-1 Well Drilling</b>	50
<b>CP-2 AWPP</b>	200
<b>CP-3</b>	200

## 5.3 Project Phases and Implementation

For the purposes of this ESIA, BWSE implementation would occur in the following phases:

- Preconstruction – i.e., actions that need to occur prior to construction, including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE RAP; however, not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance

Decommissioning refers to making a project inoperative and dismantling the structural elements or components at the end of the project lifecycle. IFC Performance Standard 1 specifies that, where applicable, the potential risks and impacts of project decommissioning are to be considered. The contract between MCA-Mongolia and AECOM for detailed design, ESIA, and RAP for BWSE also requires consideration of the decommissioning phase. However, as UB always will require water and therefore a bulk water system, effectively the useful life of the project would not end and the system would not be decommissioned.

Rather, when needed, the bulk water system would be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. As examples, after 25 years

most of the equipment at the AWPP may require replacing; whereas, physical infrastructure such as concrete basins and buried piping at the plant may have a 50-year replacement life. Based on the above, the ESIA team eliminated decommissioning from detailed study. Nonetheless, Section 5.3.3 presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

The BWSE would be constructed under three construction contract packages for competitive tendering:

- **CP-1 Production Well Drilling, Construction, Development, and Acceptance Testing**  
Comprises only establishment of the wells on both wellfields, excluding all conveyance infrastructure
- **CP-2 Advanced Water Purification Plant (AWPP)**  
Comprises construction of the AWPP, including all site civil, structural, mechanical, electrical, and instrumentation components, as well as power distribution at the AWPP site
- **CP-3 Raw and Finished Water Conveyance**
  - Comprises production well pump houses and a guard house at each wellfield (including all civil, structural, mechanical, electrical, and instrumentation components), access roads, raw water transmission branch and main pipelines from the well pump houses to the AWPP, and finished water transmission main pipelines from the AWPP to the existing water distribution network, as well as 10-kilovolt distribution lines within the two wellfields and the 10-kilovolt transmission line from the AWPP to the proposed Biokombinat wellfield

In addition, under a separate contract, the GoM would tender CP-4, which would provide high voltage transmission lines and substations to feed power to the CP-2 and CP-3 infrastructure, and hot water supply lines, heat exchangers, and a booster pump station to heat facilities at the AWPP. However, as CP-4 design is not yet contracted as of this writing, with available information being limited to preliminary investigations intended to inform a design scope, the high voltage power supply and heat supply, and their potential impacts are not assessed in this document. Rather, high voltage power supply and heat supply activities will be addressed in supplemental ESIA's expected to be issued in April 2021. The supplemental ESIA's will update the BWSE ESIA with respect to the high voltage power supply and heat supply activities and their anticipated environmental and social impacts.

AECOM developed a construction time determination schedule for the CP-1, CP-2, and CP-3 construction contract packages. The schedule was developed at the program level and is not intended to depict every detailed nuance of the project as if it were a fully detailed construction schedule. The schedule illustrates one approach towards building the project and should not be considered the only option available to the construction contractors. The following start and finish dates are based on a Compact II entry-in-force of March 2021:

	Start	End
<b>Construction Activities</b>		
<b>CP-1 Wellfields</b>	May 12, 2021	August 17, 2022
<b>CP-2 AWPP</b>	June 25, 2021	November 25, 2024
<b>CP-3 Conveyance</b>	July 05, 2021	October 27, 2023

### 5.3.1 Advanced Water Purification Plant

For the design of the AWPP, groundwater quality has been assumed to be poor consistent with the approach to address risk in the feasibility study (AECOM, 2018a) and supported by

groundwater modelling. Further, groundwater production from the proposed Biokombinat and Shuvuun wellfields could result in greater recharge into the aquifer from the Tuul River, which is polluted. While recharge of the aquifer through the soils will help to purify the water, the risk still exists that some surface water contamination will reach the groundwater, which for design purposes is considered to be under the direct influence of surface water. The risk associated with water quality is mitigated by the selection of robust conventional and advanced unit treatment processes.

Conversely, there is uncertainty about groundwater quality improvements over time. It is generally anticipated that the lowest groundwater quality would be experienced when the AWPP is commissioned. However, the planned reconstruction of CWWTP is expected to lead to improved Tuul River water quality. Over time, improved water quality in the Tuul River may lead to improved groundwater quality, in which case some advanced processes needed initially may be needed to a lesser degree later.

Public health is paramount, and it is prudent to install advanced processes in the initial construction. However, it is also prudent from a financial perspective to acknowledge potential long-term improvements in water quality. A phased approach can address this by delaying full-capacity installation of some advanced processes such as reverse osmosis or nanofiltration.

There is also uncertainty regarding the timing of future demands. The volume of finished water produced by the AWPP must match demands and, therefore, the amount of installed equipment within the AWPP must be planned to meet these demands. However, the amount of installed equipment has a direct bearing on capital and operating costs. When there is uncertainty about the timing of these demands, by extension, there is uncertainty about how much equipment to install in the initial phase.

The risk, therefore, is over-committing funds in the initial construction program in a way that results in unused and idle equipment that could be unreliable once it is finally placed into service. Or, if water quality improves significantly over time, more equipment may have been installed than would be necessary for the future condition. This would be a poor investment.

The objective of the phased approach for the AWPP is to install enough equipment to meet a future demand that is reliably estimated, and to include advanced process that will address initially poor water quality, while making provisions for installing future equipment at a later date. The future equipment would be tailored to the, by then, known water quality.

AECOM contends that the following, proposed phasing for AWPP construction offers the greatest value by providing a mid-range capital cost while not over-committing to an unrealistic initial capacity:

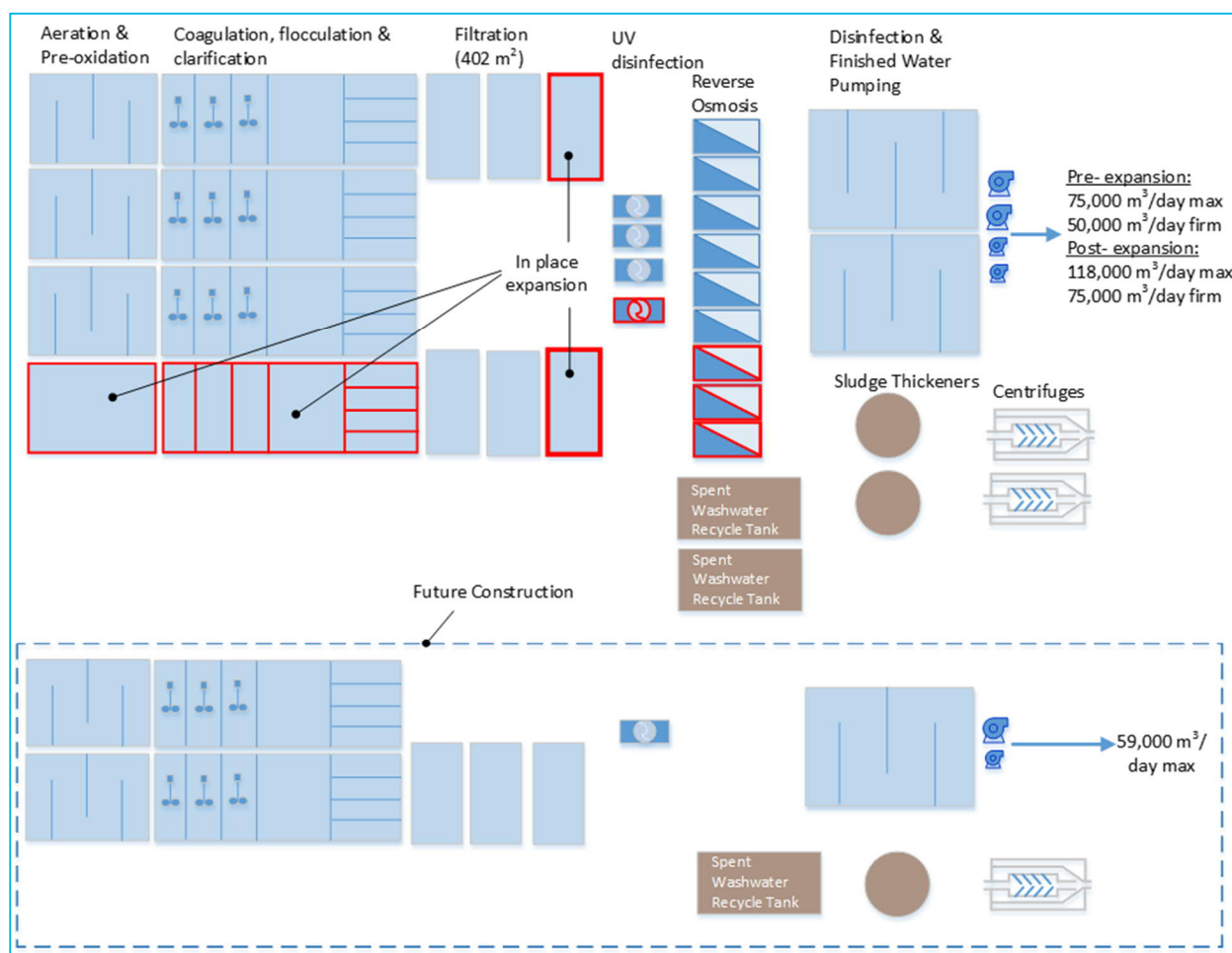
- Phase I Initial Construction
  - As planned, AWPP Phase I Initial Construction would provide up to 75,000 cubic meters per day firm capacity (i.e., with one treatment train out of service and with the remaining trains in service and operating at peak performance) and would allow for a peak capacity of about 109,000 cubic meters per day of finished water.
- Phase II Future Construction
  - When water demands approach Phase I capacity, the facility would need to be expanded. Phase II expansion would provide the future maximum finished water production capacity to approximately 127,600 cubic meters per day. Expansion would require the construction of another two trains of pre-treatment, three additional filters, and an additional ultraviolet reactor. A third centrifuge and spent wash water tank could also be needed. The clearwell, contact tank, finished water pump station, administration building, and chemical storage areas would not need expansion.

- If water quality improves sufficiently, there may be an opportunity to achieve the buildout capacity by blending about 16,000 cubic meters per day of raw well water with post membrane filtration/filtered water before disinfection, precluding the need to build any additional infrastructure aside from piping.
- The Phase II expansion would not be included in the CP-2 contract, although the design allows for facilitated expansion. Nonetheless, the required construction work for the expansion has been assessed for environmental and social impacts in this report.

Figure 5-12 shows a schematic of the considered construction phases for the AWPP. Phase I would comprise 4 treatment trains and Phase II an additional 2 treatment trains.

### **5.3.2 Production Well and Water Conveyance**

The proposed number of wells, well pumping rates for raw water, raw water transmission pipeline sizes, raw water pumping capacity, finished water pumping capacity, and finished water pipeline sizes were selected and specified to supply the ultimate capacity of the system. As demand increases and the AWPP capacity is increased by phased expansion, the total output of the project would reach ultimate capacity.



**Figure 5-12 Schematic of Phase 1 Construction and Phase II Expansion of the AWPP**

### 5.3.3 Decommissioning Process and Risks

Conceptually, decommissioning the BWSE would entail removing the project infrastructure and restoring the land at the end of the bulk water system's useful life. It is likely that the technological options and preferred methods for decommissioning of the BWSE will be different at the time of decommissioning and cannot be foreseen, and the statutory and regulatory decommissioning requirements will have changed. Decommissioning activities would be undertaken in accordance with the technology and methods, and legislation and regulations prevailing at that the time of decommissioning. However, at this time, the decommissioning requirements are not known and plans for decommissioning have not been detailed.

If undertaken, decommissioning may entail:

- Establishing and decommissioning temporary facilities, including construction camps, laydown, staging, and storage facilities, and fueling stations
- Disconnecting and removing utilities
- Demolishing, removing, and/or abandoning in place infrastructure
- Disinfecting, filling, and sealing wells and pipelines
- Decommissioning well pump houses and the AWPP
- Dismantling and removing equipment and materials



- Reusing, salvaging, recycling, and/or disposing of equipment, materials, and stockpiled, stored, and residual supplies and waste

Depending on the final land uses agreed with the authorities—which in turn would depend on structural and functional shifts in land use and changes in the economy and development priorities over time—all or parts of the project sites may require restoration to a specified representative condition, such as each site's pre-disturbance condition or a condition that would enable a designated future use. This may require that the sites be backfilled with clean and/or granular material, and re-contoured so that pre-disturbance vegetation communities can be reestablished or new land uses are accommodated.

Potential risks arising from decommissioning of the project have not been assessed in detail and have been considered only generally as the useful life of the UB bulk water system and the bulk water system is anticipated to extend decades into the future. Generally, the potential risks that would arise from decommissioning of the BWSE would be similar to those environmental, and social and gender risks identified for the construction phase, as well as loss of some socioeconomic benefits of the operation and maintenance phase:

### **Environmental Risks**

- Soil disturbance, compaction, erosion, and sedimentation
- Dust generation
- Equipment and vehicle exhaust emissions
- Equipment and vehicle noise generation
- Traffic and disruptions to vehicle and pedestrian movement
- Petroleum product, chemical, hazardous and non-hazardous material, and waste spills, leaks, and disposal
- Stream and river sediment disturbance and downstream turbidity, sedimentation, and contamination
- Water quality deterioration from sediment disturbance, and leaks and spills
- Disturbance or loss of vegetation
- Disturbance or loss of fauna, notably Mongolian marmots, and habitat degradation
- Climate change

### **Social and Gender Risks**

- Loss of employment and income
- Loss of entrepreneurial opportunities
- Risks to livelihoods
- Illegal child labor
- Temporary loss of continuity of spiritual, religious, and traditional activities
- Disturbance of the cultural and sacred landscape and places
- Social conflict
- Health, safety, and security risks to decommissioning workers and the community
- Discrimination and harassment
- Gender-based violence and sexual harassment
- Trafficking in persons and prostitution

In general terms, managing these risks would require measures to reinforce beneficial impacts and avoid and mitigate adverse impacts comparable to those specified for the BWSE construction, and operation and maintenance phases. However, due to the above cited uncertainties regarding the timing of potential future decommissioning actions, applicable

technological options and statutory and regulatory requirements, and future land uses and development priorities, such management measures cannot be detailed at this time.

## 5.4 Environmental Design Basis

As discussed in Section 3.3.2.6, best engineering practices are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA. These practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. Their implementation is assumed in the impact analysis presented in this ESIA.

For each construction contract package, the applicable best engineering practices are detailed as technical specifications and are set forth in Section V, Works Requirements of the respective Construction Contract Documents. Therefore, they would be implemented regardless of the findings of the ESIA. Those technical specifications that the ESIA team assumed would be taken by the construction contractors and would avoid or minimize potential adverse environmental and social impacts comprise the environmental design basis of the BWSE project. They are listed below, organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into the following sections. The indicated relevant issues are addressed by technical specifications in the respective sections. Appendix L presents the technical specifications that comprise the BWSE project environmental design basis.

### **Division 1 – General Requirements**

#### **Section 01030, Special Requirements**

- Site-specific health and safety plan
- Site-specific emergency action plan
- Site-specific hazardous waste management plan
- Backfilling operations following pipe laying
- Application of clean water to control dust
- Removal and legal disposal of unsuitable material and excess material
- Disposal of debris
- Preconstruction Video Recording of Entire Site
- Detours and Road Accessibility
- Owner Obtained Permits

#### **Section 01046, Control of Work**

- Hours of Construction
- Safeguarding of Open Excavations
- Occupying Private Land
- Protection of Streets
- Care and Protection of Property

#### **Section 01063, Miscellaneous Requirements**

- Traffic Control
- Maintain Flows of Existing Utilities

#### **Section 01110, Environmental Protection Procedures**

- Protection of Existing Structures and Utilities

- Cleanup and Disposal of Excess Material
- Prevention of Environmental Pollution
- Erosion Control
- Protection of Streams, Wetlands and Surface Water
- Protection of Land Resources
- Protection of Air Quality
- Noise Control

**Section 01500, Temporary Facilities**

- Field Offices
- Visitor Center
- Internet Service
- Telephone Service
- Temporary Perimeter Fence
- Potable Water for Construction and Domestic Purposes
- Temporary Electrical
- Temporary Sanitary Conveniences
- Barricades
- Temporary Heat
- Shelter and Protection of Materials
- Site Security

**Section 01568, Erosion Control, Sedimentation & Containment of Construction Materials**

- Erosion Control

**Section 01610, Delivery, Storage and Handling**

- Storage and Handling of Hazardous Materials

**Section 01700, Contract Closeout**

- Final Cleaning

**Section 01710, Cleaning Up**

- Cleaning Up Project Site

**Division 2 – Site Work**

**Section 02100, Site Preparation**

- Special Requirements
  - Contractor shall repair or replace any structures that are damaged
  - Disposal of waste/surplus materials
  - Inform Owner if there were archeological findings during site preparation
- Clearing, Grubbing, Tree & Stump Removal
- Disposal of Waste Materials

- Sediment and Erosion Control
- 
- Section 02140, Dewatering
  - Dewatering
  -
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Excavation
  - Separation of Excavated Material for Reuse
  - Trench Excavation
  - Reuse and Disposal of Surplus Excavated Materials
  - Care and Restoration of Property
  - Backfilling
  -
- Section 02230, Site Clearing
  - Clearing and Grubbing
  -
- Section 02268, Erosion Control Barrier
  - Erosion Control Barrier
  -
- Section 02480, Landscaping
  - Plants
  - Loam and Seed
  - Planting
  - Maintenance of Seeded Areas and Planting
  -
- Section 02483, Planting Operations
  - Planting and Maintenance of Trees, Shrubs and Ground Cover
  -
- Section 02485, Loaming and Seeding
  - Loaming and Seeding of disturbed area
  - Wetland Seed Mixture
  - Straw for Erosion Control
  -
- Section 02672, Water Supply Well Construction, Development and Pumping Tests
  - Generalized water Supply Description
  - Well Installation Plan
  - Protection of Work and Property
  - Clean-Up
  - Protection of existing Conditions
  - Drilling Preparation
  - Performance Pump Testing
  - Final Disinfection
  - Site Clean-Up

In instances where the implementation of best engineering practices, including those incorporated into the BWSE design as technical specifications, does not avoid or reduce

residual, adverse impacts to acceptable levels—herein defined as negligible or low impact significance, per the impact determination methodology outlined in Section 3.3 and the impact determinations in Section 7—management measures were formulated and incorporated into the respective ESMPs. In turn, construction phase management measures then were incorporated as technical specifications in the respective construction contract documents. This iterative process is intended and expected to provide the Owner with enforceable contractual instruments to implement the mitigation prescribed in the ESIA.

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## 6. Baseline Data Conditions

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This section provides a description of the environmental and social baseline condition of the BWSE project, focusing on the proposed Aol, as described in Section 3.3.1.1. This baseline condition is based on an update of ESBS report (AECOM, 2018b) and additional field survey information collected during the summer and autumn of 2019 (BGM, 2019).

### 6.1 Environmental Baseline

#### 6.1.1 Topography and Landscape

The elevation of the Aol ranges from 1,204 to 1,625 meters above sea level (see Figure 6-1). The highest point is the Songinokhairkhan Mountain summit and the lowest area is the alluvial<sup>24</sup> sediment valley of the Tuul River. The elevation of proposed wellfields in the southwest of UB range from approximately 1,210 meters (Shuvuun wellfield) to 1,250 meters (Biokombinat wellfield) above sea level (AECOM, 2019a).

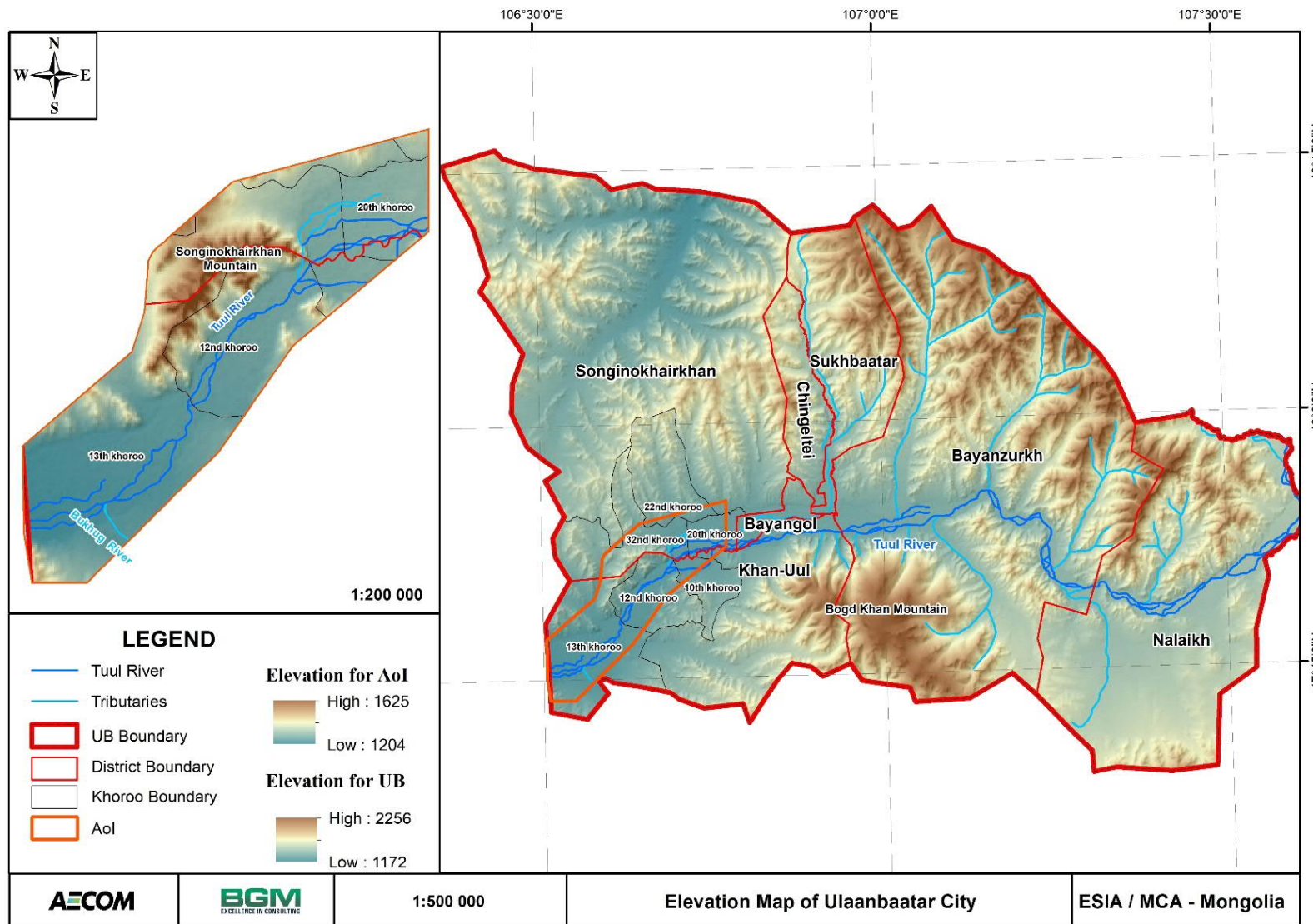
#### 6.1.2 Climate

Meteorological data is collected in UB at several meteorological stations, including Ulaanbaatar Station (1,300 meters above sea level), Buyant-Ukhaa (1,271 meters above sea level), and Terelj Stations (1,533 meters above sea level), as shown in Figure 6-2. The Buyant-Ukhaa Station is the closest to the Aol. The microclimate of the Aol is described based on meteorological data collected over the last 40 years (1980-2018) with an exception of Terelj station which was established in 1986.

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<sup>24</sup> Alluvial pertains to material or processes associated with transportation and/or subaerial deposition by concentrated running water. (United States Department of Agriculture, 2019, Glossary of Landform and Geologic Terms)





**Figure 6-1 Digital Elevation Model of Tuul River Valley**

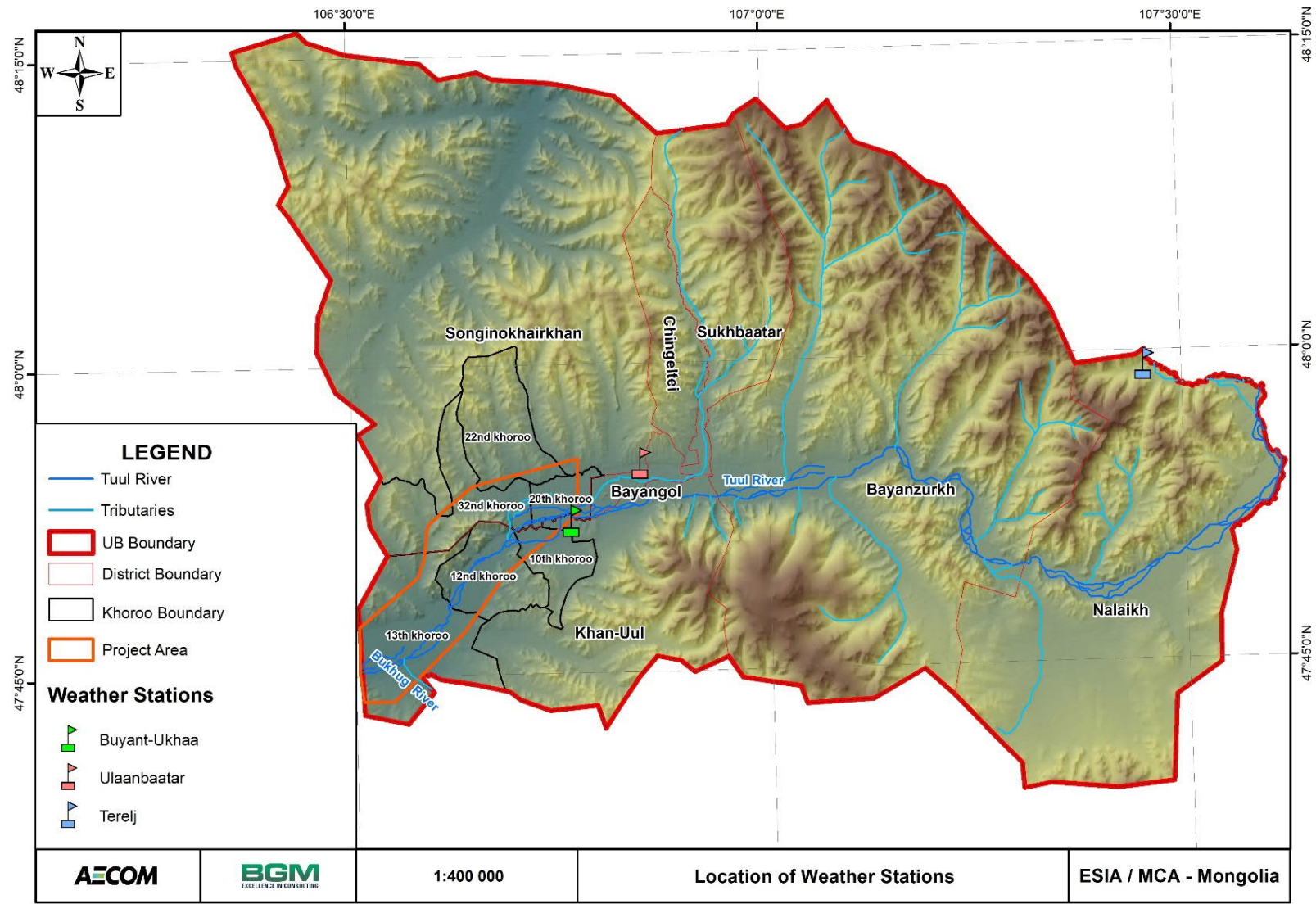


Figure 6-2 Location of Meteorological Stations

### 6.1.3 Sunshine and Solar Radiation

Sunshine and solar radiation are currently measured at only the Ulaanbaatar Station. The annual average net radiation at the station is 1,609 joules per square meter, while the average net radiation is 796 joules per square meter in the wintertime and 2,281 joules per square meter in the summertime. The average amount of solar energy that reflects off the ground is 366 joules per square meter, as shown in Figure 6-3.

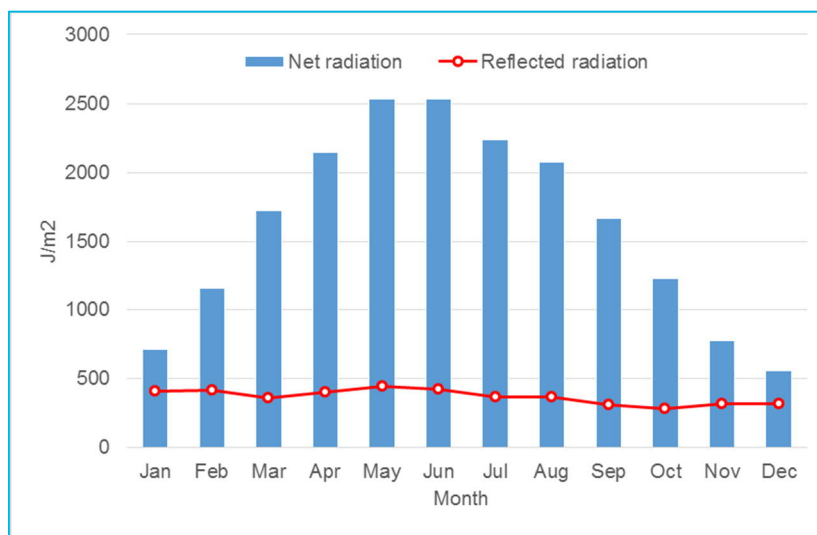


Figure 6-3 Net and Reflected Solar Radiation, Ulaanbaatar Station 1980-2018

#### 6.1.3.1 Air and Surface Temperature

Long-term average air temperature was recorded as -3.5°C at the Terelj Station, -0.1°C at the Ulaanbaatar Station, and 0.9°C at the Buyant-Ukhaa Station. Average annual air temperatures have tended to rise over the last several years (see Figure 6-4).

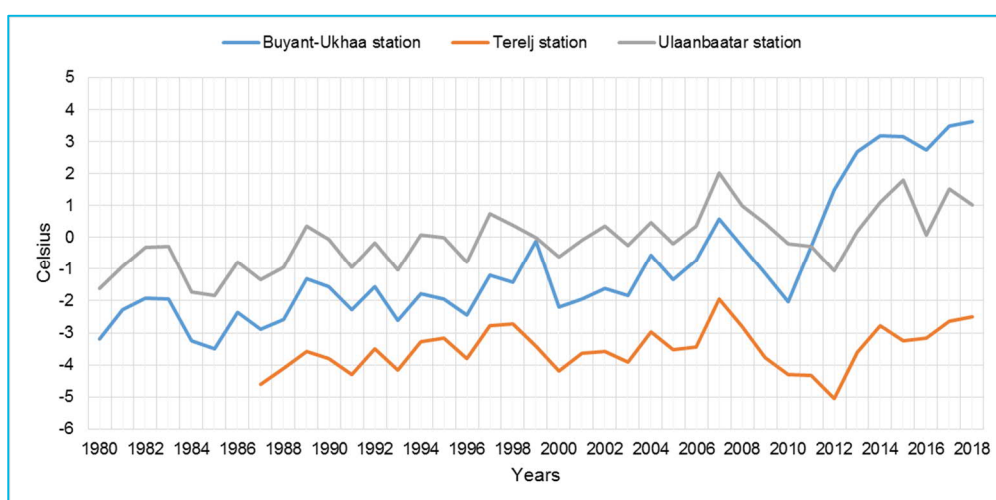


Figure 6-4 Annual Mean Air Temperature (°C), 1980-2018

Table 6-1 and Figure 6-5 show the monthly fluctuations in long-term average air temperatures.

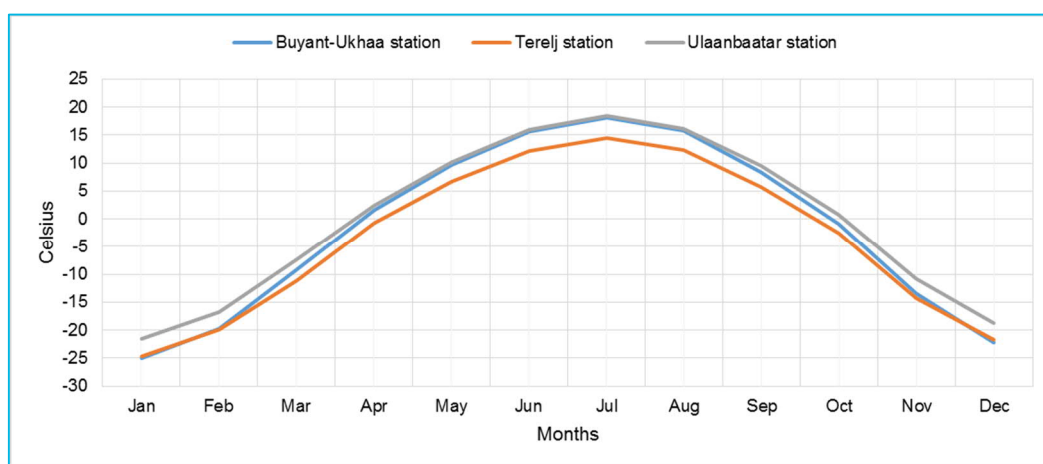
Table 6-2 shows that from 1980 through 2018 the average air temperature in UB was 13.5°C during the summer, 7.2°C during the fall, -19.2°C in winter, and -8.9°C in spring. The seasonal

fluctuations of the average air temperature at Buyant-Ukhaa Station are presented in the Figure 6-6.

**Table 6-1 Annual Mean Air Temperature (°C), 1980-2018**

Stations	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
<b>Buyant-Ukhaa</b>	-25.2	-19.9	-9.6	1.25	9.5	15.5	18.05	15.6	8.3	-0.9	-13.4	-22.4
<b>Terelj</b>	-24.5	-19.8	-11.5	-0.9	6.6	12.06	14.4	12.2	5.6	-2.6	-14.1	-21.7
<b>Ulaanbaatar</b>	-21.7	-16.7	-7.8	2.01	10.03	15.8	18.3	16.04	9.4	0.6	-10.9	-19.05
<b>Average</b>	-23.7	-18.7	-9.5	0.8	8.8	14.6	17.1	14.8	7.9	-0.8	-12.7	-21.03

**Note: Terelj Station is from 1986-2018**



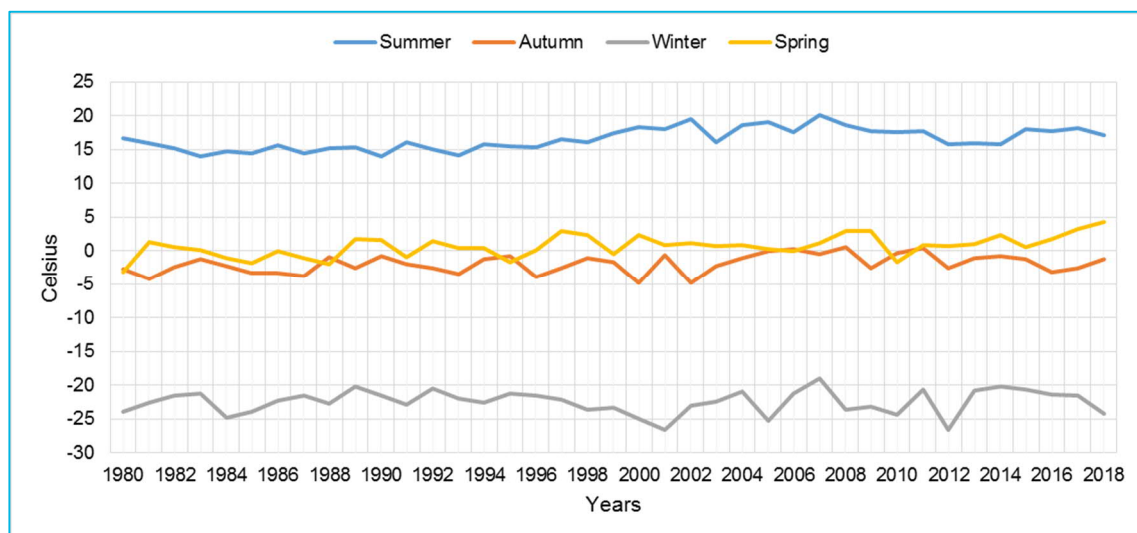
**Figure 6-5 Monthly Mean Air Temperature Fluctuations, Multiple Years**

**Table 6-2 Average Annual Air Temperature (°C), 1980-2018**

Stations	Season			
	Summer	Autumn	Winter	Spring
<b>Buyant-Ukhaa</b>	14.3	7.6	-20.4	-9.1
<b>Terelj</b>	11.0	5.0	-20.1	-10.5
<b>Ulaanbaatar</b>	14.6	8.6	-17.2	-7.3
<b>Average</b>	13.5	7.2	-19.2	-8.9

**Note: Terelj Station is from 1986-2018**



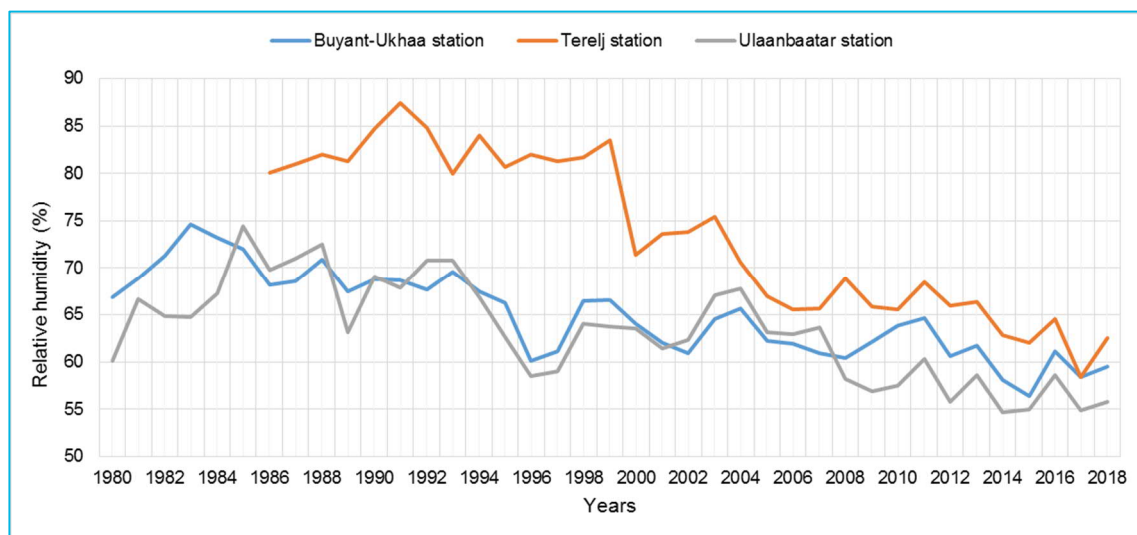


**Figure 6-6 Seasonal Average Air Temperature Fluctuations, Buyant-Ukhaa Station 1980-2018**

The annual mean surface temperature around the city of UB is 1.9°C. The soil surface mean temperature ranges from -22.6°C to -24.6°C in January and from 19.5°C to 20.8°C in summertime. The ground starts to freeze in mid-October and typically remains frozen for 195 to 200 days, thawing in mid-April.

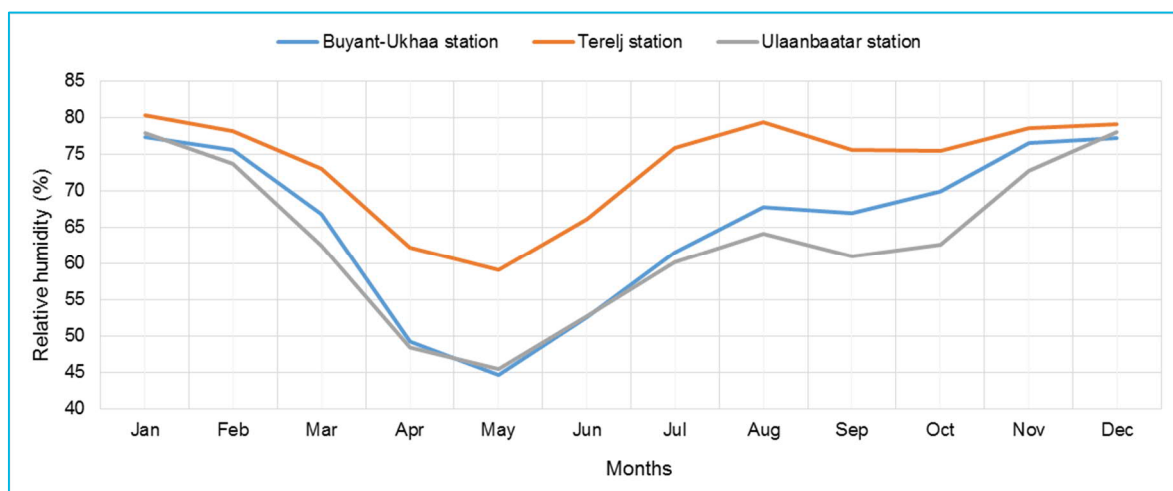
### 6.1.3.2 Humidity

As provided in Figure 6-7, annual mean relative humidity in UB had been decreasing since 1980. A significant drop had been recorded since 2000 due to significant increase of air temperature (see Figure 6-4). The average annual relative humidity for the period between 1980 and 2018 was calculated as 73.1 percent at the Terelj Station, 64.9 percent at Buyant-Ukhaa Station, and 63.3 percent at Ulaanbaatar Station.



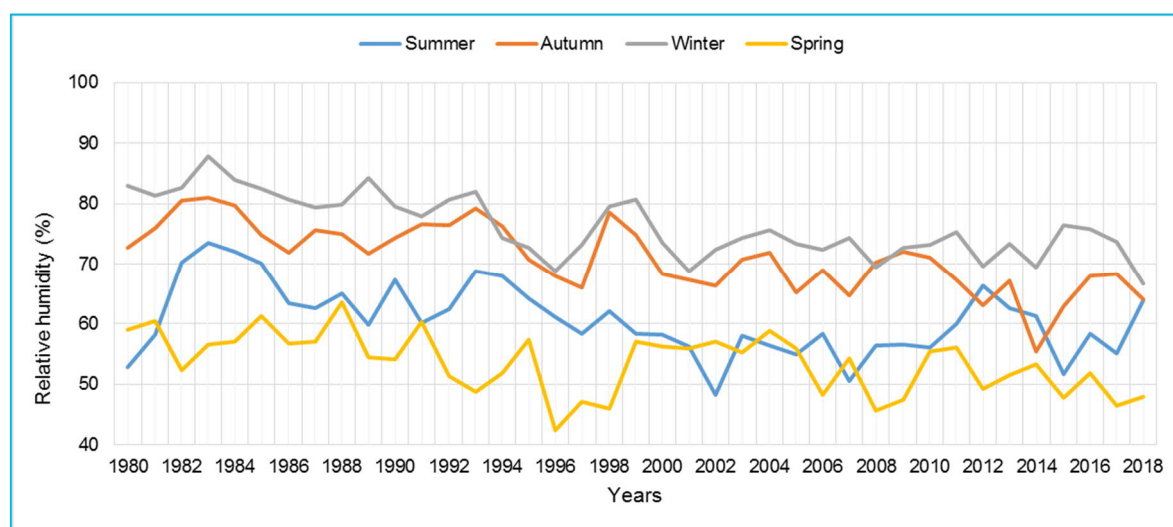
**Figure 6-7 Average Annual Relative Humidity, 1980-2018**

As shown in Figure 6-8, monthly fluctuations in relative humidity in UB decreased from 63 to 46 percent in the springtime for the period between 1980 and 2018.



**Figure 6-8 Monthly Change of Relative Humidity, 1980-2018**

The relative humidity at Buyant-Ukhaa Station, the closest station to the Aol, is 52.9 percent in summer, 68.2 percent in autumn, 76.5 percent in winter and 62.3 percent in spring (Figure 6-9).

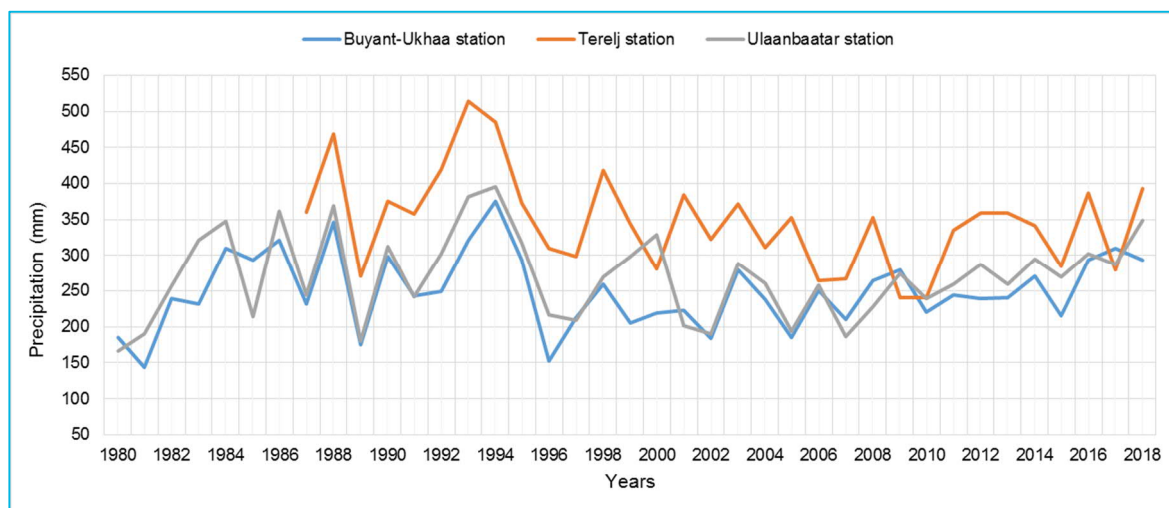


**Figure 6-9 Season and Annual Fluctuation of Relative Humidity, Buyant-Ukhaa Station 1980-2018**

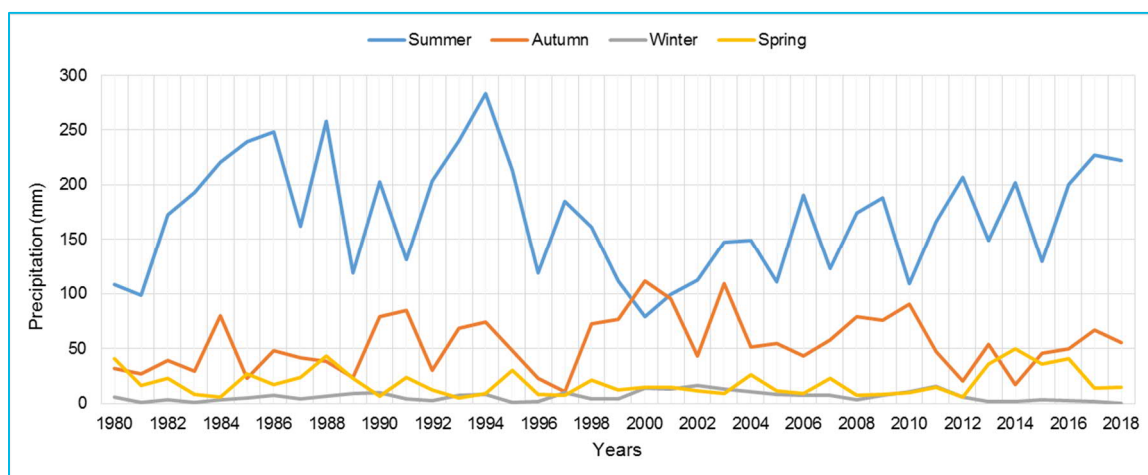
### 6.1.3.3 Precipitation

For the period 1980-2018, the long-term average precipitation recorded at Terej Station is higher (347.5 millimeters) than that at UB and Buyant-Ukhaa Stations, where the long-term averages are 270 millimeters and 250 millimeters, respectively (see Figure 6-10). Based on analysis of the precipitation data collected at Buyant-Ukhaa Station for the 1980-2018 period of record, the Aol received a total of 250 millimeters of precipitation yearly. Out of this annual total, 44.9 percent fell in summer, 46.6 percent in fall, 4.4 percent in winter, and 4.1 percent in spring. Figure 6-11 illustrates seasonal patterns of precipitation at Buyant-Ukhaa Station for the period 1980-2018.





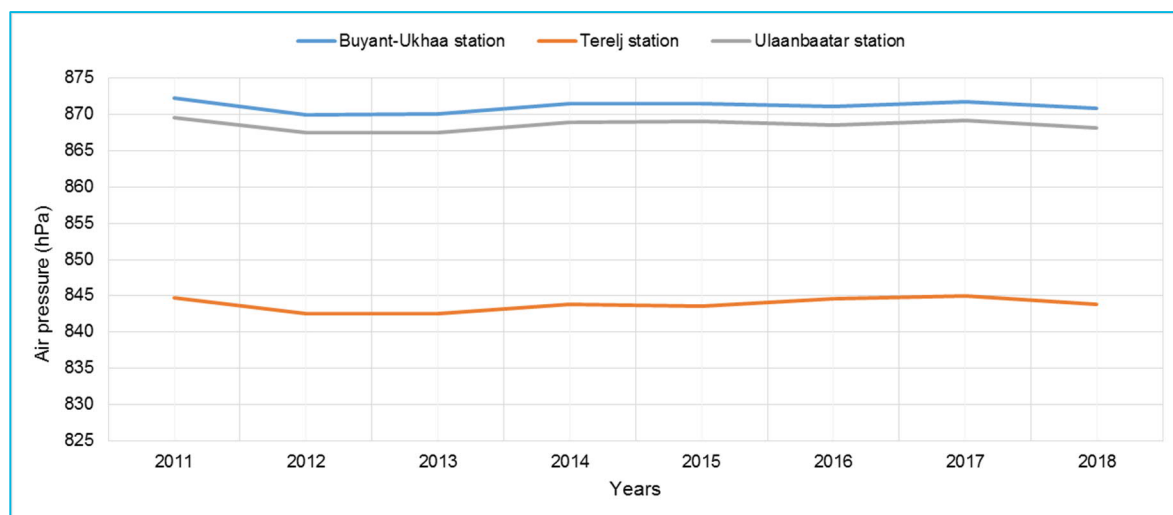
**Figure 6-10 Average Annual Precipitation, 1980-2018**



**Figure 6-11 Seasonal Precipitation, Buyant-Ukhaa Station, 1980-2018**

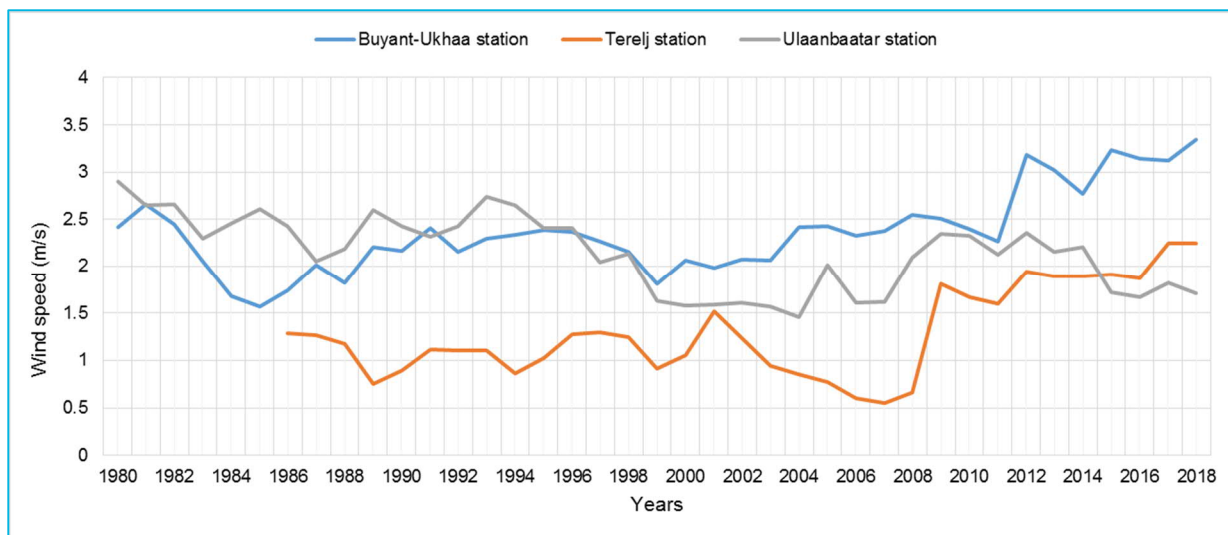
#### 6.1.3.4 Air Pressure and Wind

Between 2011 and 2018, the annual average air pressure was 843.7 gigapascal at the Terelj Station and 871 gigapascal at the Buyant-Ukhaa Station, the closest station to the Aol (see Figure 6-12).



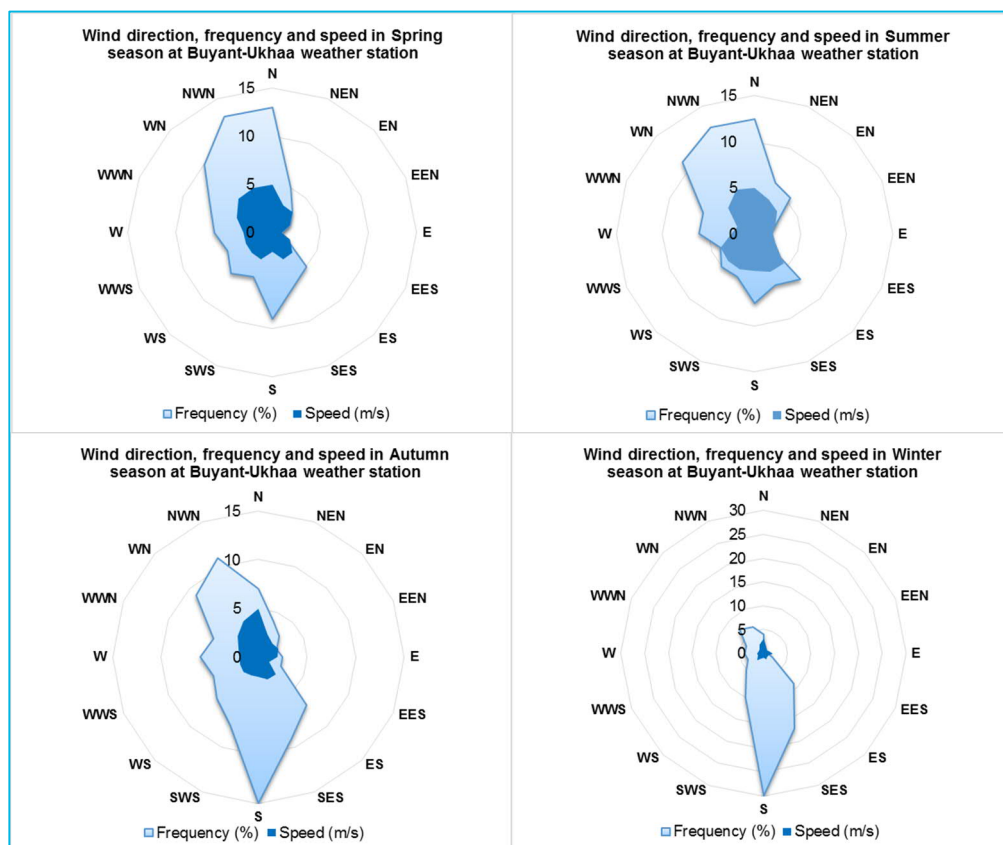
**Figure 6-12 Average Annual Air Pressure, 2011-2018**

From 1980 to 2018, the average annual wind velocity was 2.1 meters per second at Buyant-Ukhaa Station, 2.3 meters per second at Ulaanbaatar Station, and 1.29 meters per second at Terelj Station. The average seasonal wind speed fluctuation ranged from 1 to 2 meters per second during winter months; whereas, it reached a maximum of 3 to 4 meters per second in April and May (see Figure 6-13).



**Figure 6-13 Average Annual Wind Velocity, 1980-2018**

Wind direction varies throughout UB and has seasonal, monthly, and even daily patterns. As shown in Figure 6-14, at Buyant-Ukhaa Station, the prevailing wind directions are south and southeast. Between 1980 and 2018, the overall frequency of winds from the south and southeast was approximately 30.7 percent, and increased in autumn, reached 53.0 percent during wintertime, and reduced to 19.0 percent in summertime.



**Figure 6-14 Wind Frequency and Speed, Buyant-Ukhaa Station 1980-2018**

## 6.1.4 Air Quality

### 6.1.4.1 Air Quality Monitoring in UB

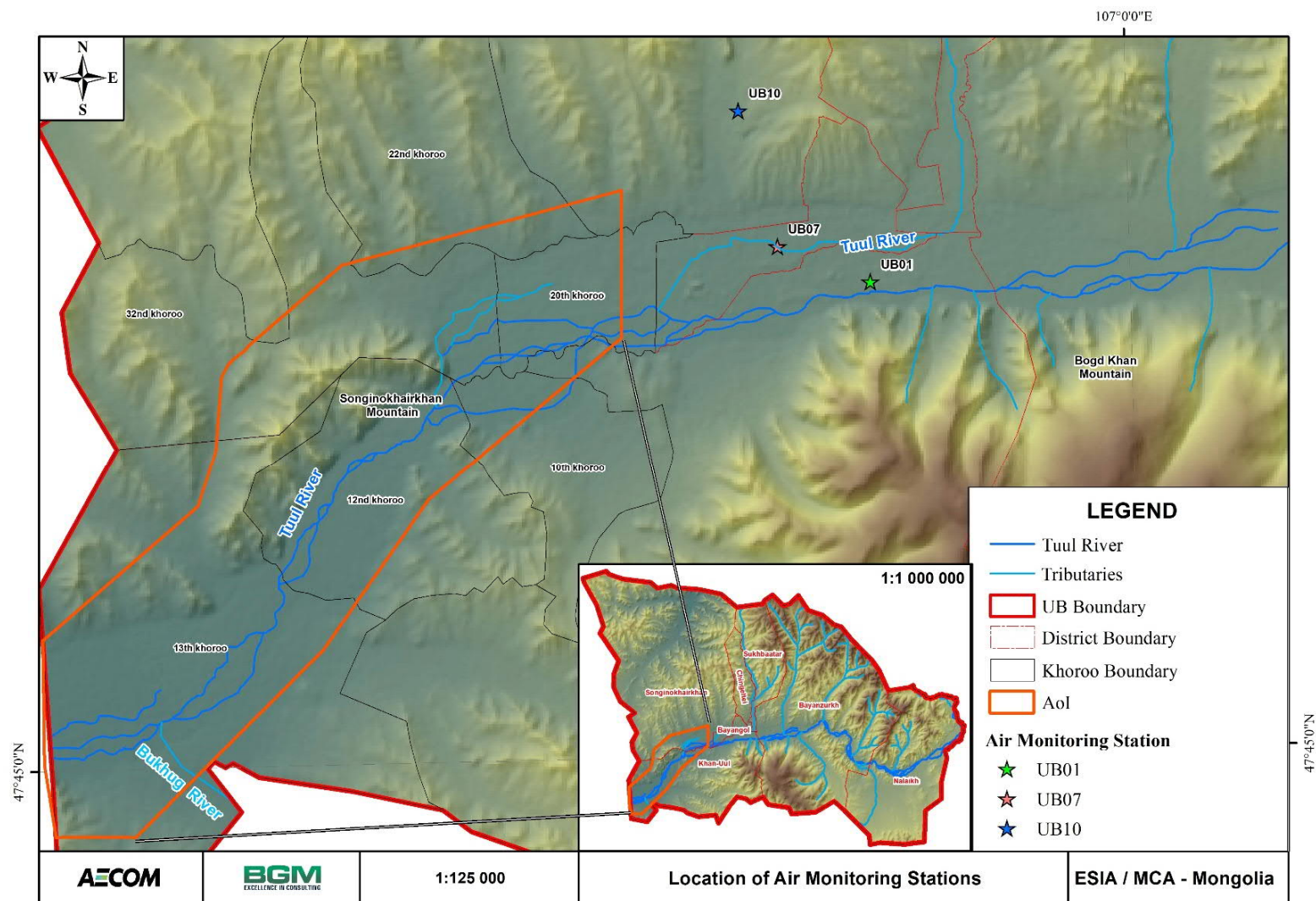
At present, air quality monitoring has been conducted<sup>25</sup> in UB at 14 different locations<sup>26</sup>, using nine automatic, four manual, and one portable device. Figure 6-15 shows air monitoring stations at Tolgoit (UB10 – at a distance of 4.7 kilometers from AoI border), Misheel Expo (UB01 – 5.2 km), and Nisekh (UB07 – 1.8 km), the closest monitoring station to the AoI.

Based on data collected at Nisekh Station, as well as Tolgoit and Misheel Expo Stations, for the last five years (2015-2019), the air quality conditions in the AoI are assessed below with respect to the Mongolian ambient air quality standards at MNS 4585:2016 (Appendix A, Table A-2).

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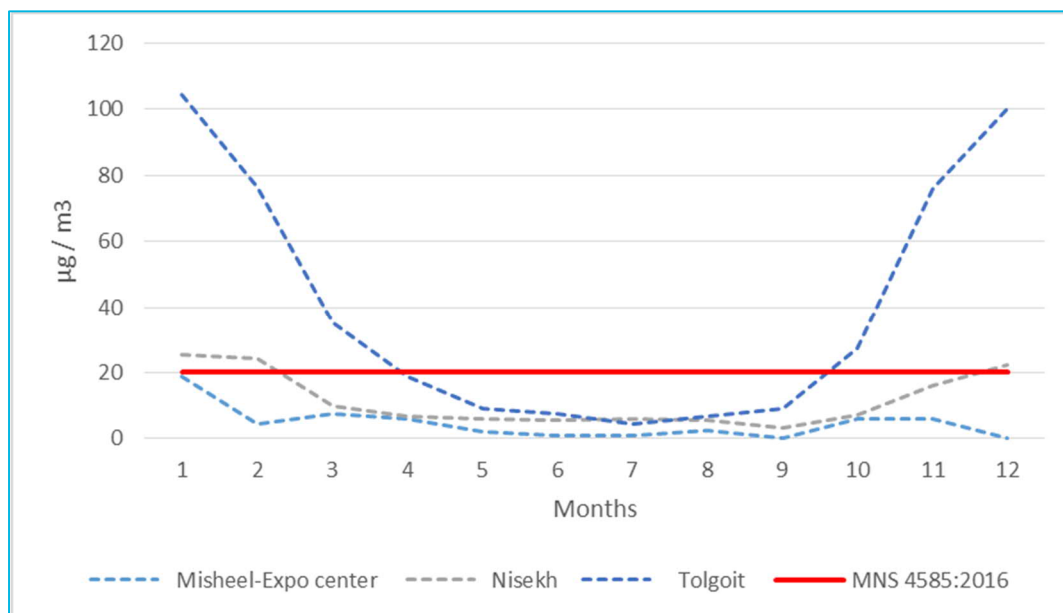
<sup>25</sup> National Agency Meteorology and Environmental Monitoring.

<sup>26</sup> <http://www.aqaar.mn/article/activity/airquality>



**Figure 6-15 Air Quality Monitoring Locations near Aol**

Figure 6-16 shows the annual change in sulfur dioxide concentrations. In wintertime, around Nisekh and Tolgoit Stations, there have been many reported exceedances of the air quality standards for sulfur dioxide. The annual average standard (20 micrograms per cubic meter) was exceeded 5 times at Misheel Expo station (100 micrograms per cubic meter) in December and slightly more in January<sup>27</sup>.

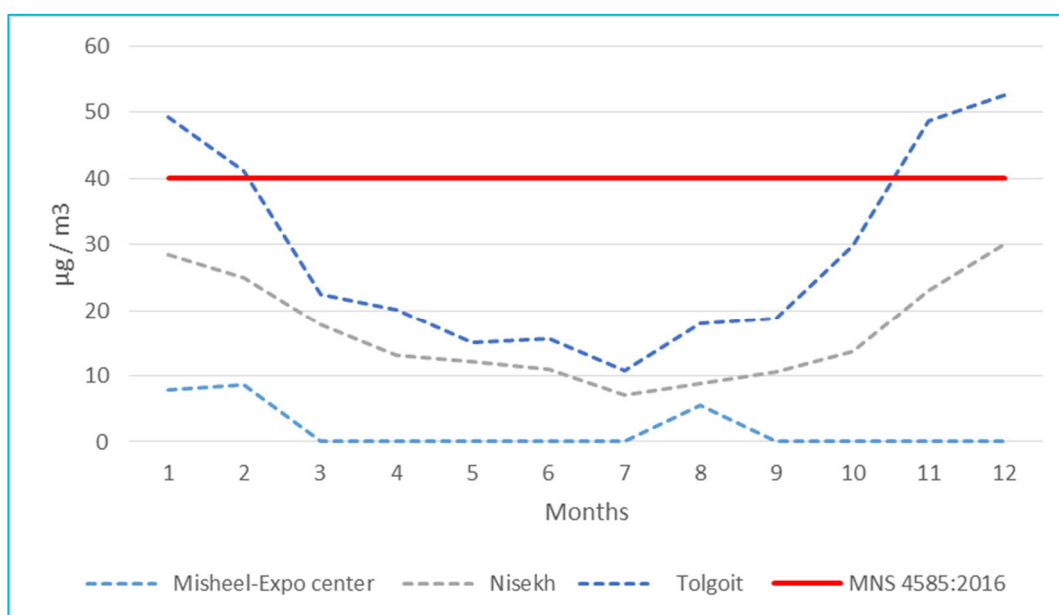


**Figure 6-16 Annual Trend of Sulfur Dioxide Concentrations, 2015-2019**

Figure 6-17 shows that nitrogen dioxide concentrations typically remained below the annual average air quality standard of 40 micrograms per cubic meter during the 2015-2019 period of record. However, nitrogen dioxide concentrations exceeded the acceptable level by 10-15 micrograms per cubic meter at Tolgoit Station during wintertime.

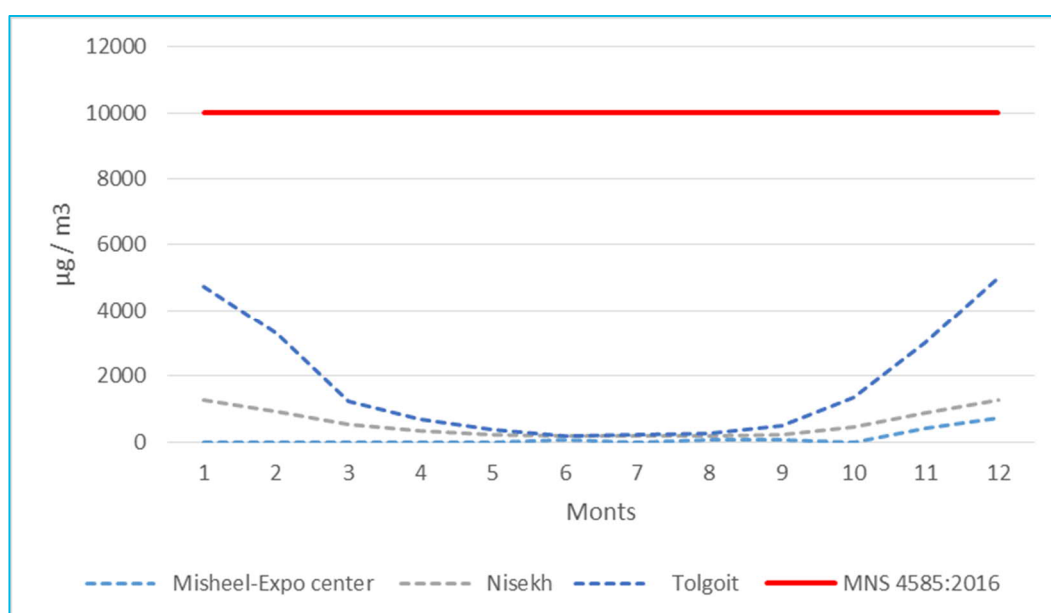
<sup>27</sup> <http://www.agaar.mn/article/activity/airquality>





**Figure 6-17 Annual Trend of Nitrogen Dioxide Concentrations, 2015-2019**

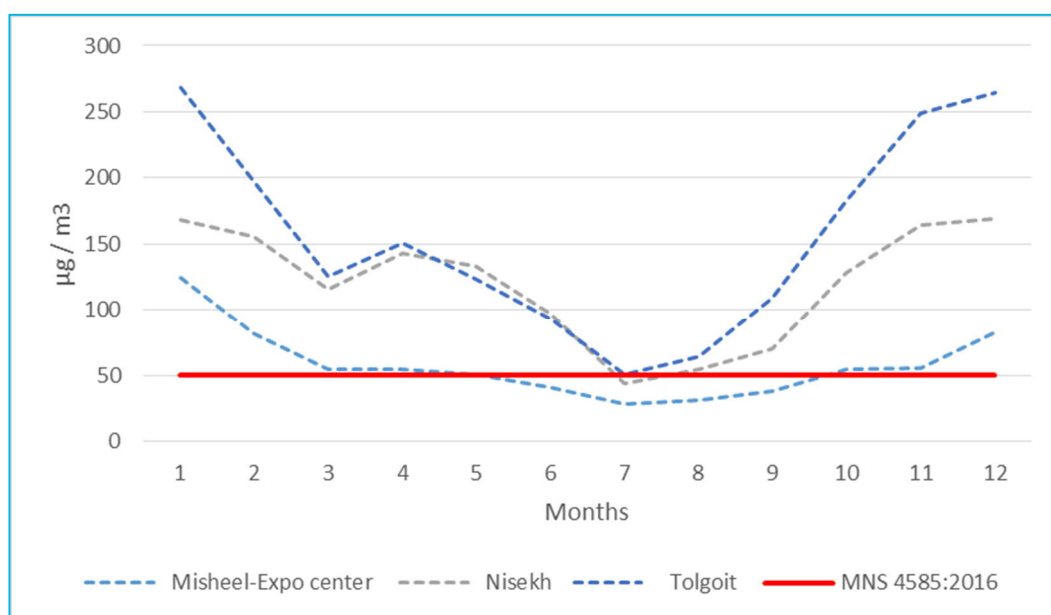
The annual average air quality standard for carbon monoxide is 10,000 µg/m³. In UB near the Aol, there were no reported exceedances of the standard and concentrations remained substantially below the annual average standard, as shown in Figure 6-18.



**Figure 6-18 Annual Trend of Carbon Monoxide Concentrations, 2015-2019**

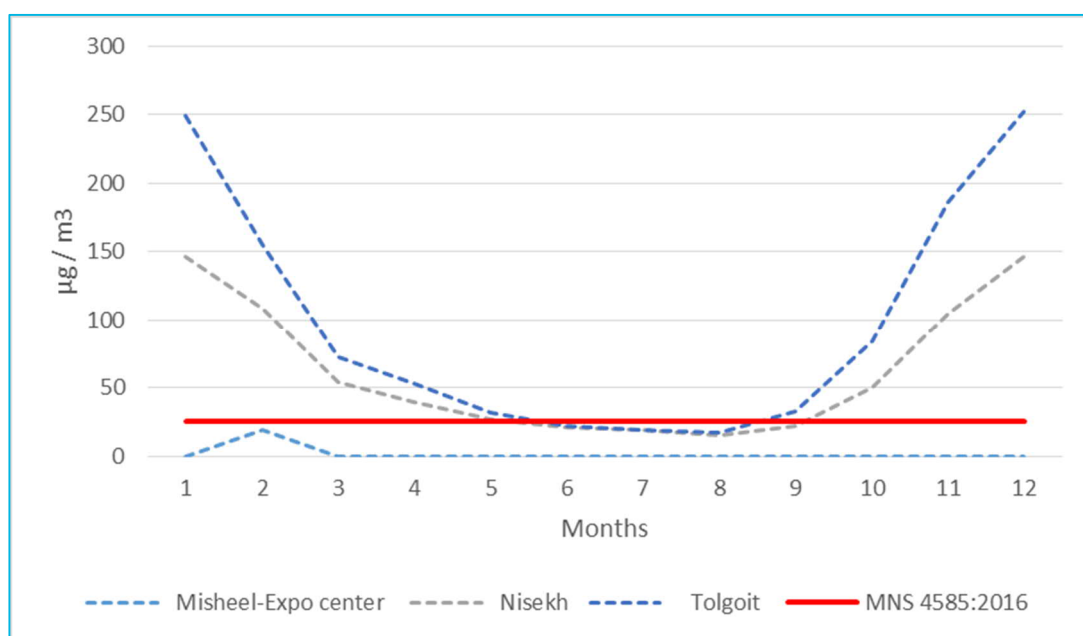
As shown in Figure 6-19, the concentration of respirable particle matter (particle matter less than 10 micrometers in aerodynamic diameter; PM<sub>10</sub>) is very sensitive to seasonal conditions. According to data from Nisekh and Tolgoit Stations for 2015-2019, PM<sub>10</sub> concentrations increased to maximum levels of approximately 170 and 270 micrograms per cubic meter at Nisekh and Tolgoit Stations, respectively, during the coldest months. Although the concentrations decreased in January and February, levels at both Nisekh and Tolgoit spiked again, reaching about 150 micrograms per cubic meter in April. PM<sub>10</sub> concentrations often exceed the permissible limit.





**Figure 6-19 Annual Trend of Respirable Particle Matter (PM<sub>10</sub>) Concentrations, 2015-2019**

The Mongolian ambient air quality standards at MNS 4585:2016 set the average annual permissible limit for fine particle matter (particle matter less than 2.5 µm in aerodynamic diameter; PM<sub>2.5</sub>) as 25 micrograms per cubic meter. At the Misheel Expo station, there were no records of exceedance of the standard. However, around Airport, the closest to Aol station, and Tolgoit stations, the pollutant concentrations were below the permissible level during the warm season. PM<sub>2.5</sub> concentrations exceeded the limit 3 to 9 times (80-150 micrograms per cubic meter) in wintertime at Nisekh and Tolgoit stations (see Figure 6-20).



**Figure 6-20 Annual Trend of Fine Particle Matter (PM<sub>2.5</sub>) Concentrations, 2015-2019**

#### 6.1.4.2 Air Quality Field Measurement

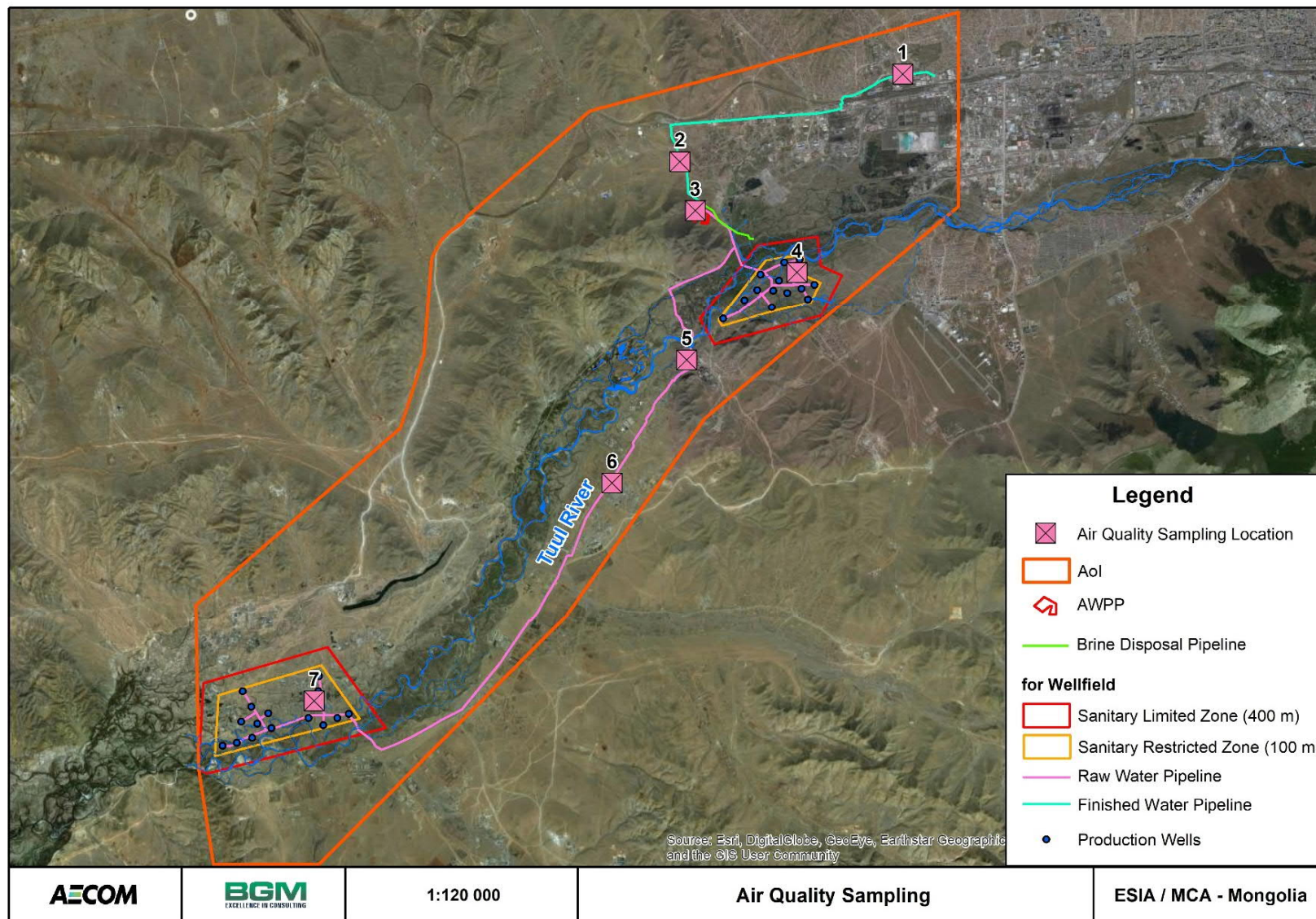
The project would generate impacts on air quality at local scale. In other words, dust would generate from all project development activities during the construction phase of the BWSE project implementation. Considering the above two factors, a total of 7 locations across the overall

Aol of the BWSE project are selected for ambient air quality measurement. The overall Aol of the BWSE project covers 17.898 hectares as shown in Figure 6-21.

Thus, on February 08, 2020, ESIA team together with expert from Central Laboratory of Environment and Monitoring is measured ambient air quality and noise level samples at 7 locations; 2 along FWP, 1 at AWPP site, 1 at Biokombinat wellfield, 2 along RWP and 1 at Shuvuun wellfield site as shown in Figure 6-21. The ambient air quality and noise level was measured during 20 minutes by using the "Dustrack8530" device. Table 6-3 show the air quality and noise level in overall Aol of the BWSE project and compared with MNS 4585:2016.

**Table 6-3 Ambient Air Quality and Noise level in Aol**

Air sampling location	SO <sub>2</sub> (µg /m <sup>3</sup> )	NO <sub>2</sub> (µg /m <sup>3</sup> )	TSP (µg /m <sup>3</sup> )	Noise dB(A)
<b>Location 1</b>	32	45	110	45
<b>Location 2</b>	38	54	123	52
<b>Location 3</b>	36	40	145	52
<b>Location 4</b>	36	56	145	44
<b>Location 5</b>	31	49	106	43
<b>Location 6</b>	28	41	86	40
<b>Location 7</b>	29	45	89	41
<b>MNS 4585:2016</b>	<b>450</b>	<b>200</b>	<b>500</b>	<b>60</b>



**Figure 6-21 Air Quality Sampling Location**

An air quality index has been used by government agencies<sup>28</sup> to communicate to the public how polluted the air currently is or how polluted it is forecast to become. Public health risks increase as the air quality index rises. Different countries have their own air quality indices, corresponding to different national air quality standards. The air quality index<sup>29</sup> was calculated in order to assess baseline air quality in Aol.

The classification of air quality index and relevant uses and treatment issues are described in Table 6-4. The air quality index was calculated as below equation.

$$AQI = (C_i / PL_i) * 100$$

Where; AQI-air quality index,  $C_i$ - concentration of  $i$  variable,  $PL_i$ - permissible values of  $i$  variable

**Table 6-4 Classification of Air Quality Index and Definition**

AQI	Air pollution category	Definition
<b>0-50</b>	<b>Good</b>	No health implications. Air quality is considered satisfactory and poses little or no risk
<b>51-100</b>	Moderate	Air quality is acceptable. However, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive for air pollutants (ozone substances and particulate matters)
<b>101-250</b>	Unhealth for sensitive groups	Members of sensitive groups may experience health effects i. e people with heart and lung diseases, respiratory problems and bronchitis.
<b>251-400</b>	Unhealthy	General population may experience minor symptoms. Members of sensitive groups may experience more serious health effects.
<b>401-500</b>	Very unhealthy	Health warnings of emergency conditions. The entire population is likely to be affected.
<b>501&lt;</b>	Hazard	Health alert. Everyone may experience more serious health effects.

The air quality index in Aol is ranged from 20 to 29 as shown in Table 6-5.

**Table 6-5 Air Quality Index at Aol**

Air sampling location	AQI	Air pollution category	Impacts on Health	Recommendation
<b>Location 1</b>	23	Good	No impact	Not required
<b>Location 2</b>	27	Good	No impact	Not required
<b>Location 3</b>	20	Good	No impact	Not required
<b>Location 4</b>	29	Good	No impact	Not required
<b>Location 5</b>	25	Good	No impact	Not required
<b>Location 6</b>	21	Good	No impact	Not required
<b>Location 7</b>	23	Good	No impact	Not required

<sup>28</sup> <https://web.archive.org/web/20180612162706/https://www.airnow.gov/index.cfm?action=airnow.international>

<sup>29</sup> MEGD. 2014a. "General Procedure of Assessing and Reporting Air Pollution by Air Quality Index". Annex I of Order # A-327 dated 17 September 2014 of the MEGD.

Along the Tuul River's northern floodplain in Shuvuun area, the land or soil has been damaged due to many gravel mining quarries, which alter the landscape by digging large open-pits, creating artificial ponds, and lowering the groundwater levels. In addition to this, the open-pits and roads created by heavy vehicles results in increased weathering of soil and causes fugitive dust (detailed information can be found in Section 6.1.7).

Therefore, current potential impact on air quality due to ongoing gravel mining activities were predicted based on Air dispersion model, namely AERMOD. The amount of total suspended particles generated by gravel mining area varies at different times of the year, depending on the weather conditions and the moisture content of the extracted gravel materials. Thus, the spatial distribution of total suspended particles were calculated by selecting the dry and wet season of year (see Figure 6-22 and Figure 6-23).

As shown in Figure 6-22, in dry season, estimated daily average total suspended particles due to gravel mining area at the Shuvuun wellfield site is ranged between 300 and 2500 micrograms per cubic meter which is 2-16.6 times higher than the maximum permissible level specified in MNS 4585:2016. As shown in Figure 6-23, in wet season, estimated daily average total suspended particles in gravel mining area is drastically reduced and ranged from 300 to 700 micrograms per cubic meter which is 2-4.5 times higher than the maximum permissible level specified in MNS 4585:2016. However, areas, where total suspended particles exceeded the MNS 4585:2016, are mainly found nearby the ongoing gravel mining area in Shuvuun wellfield (see Figure 6-22 and Figure 6-23).



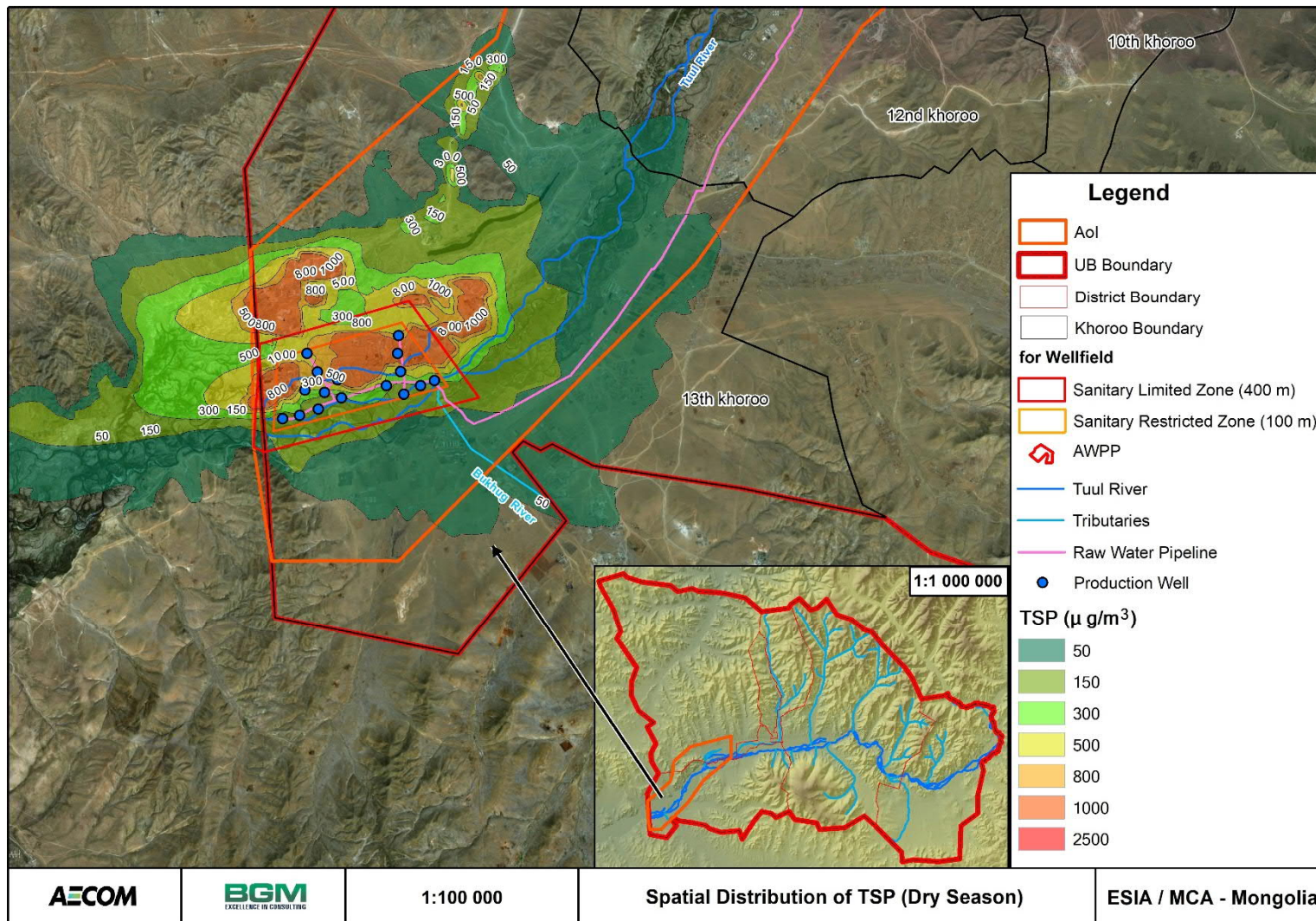
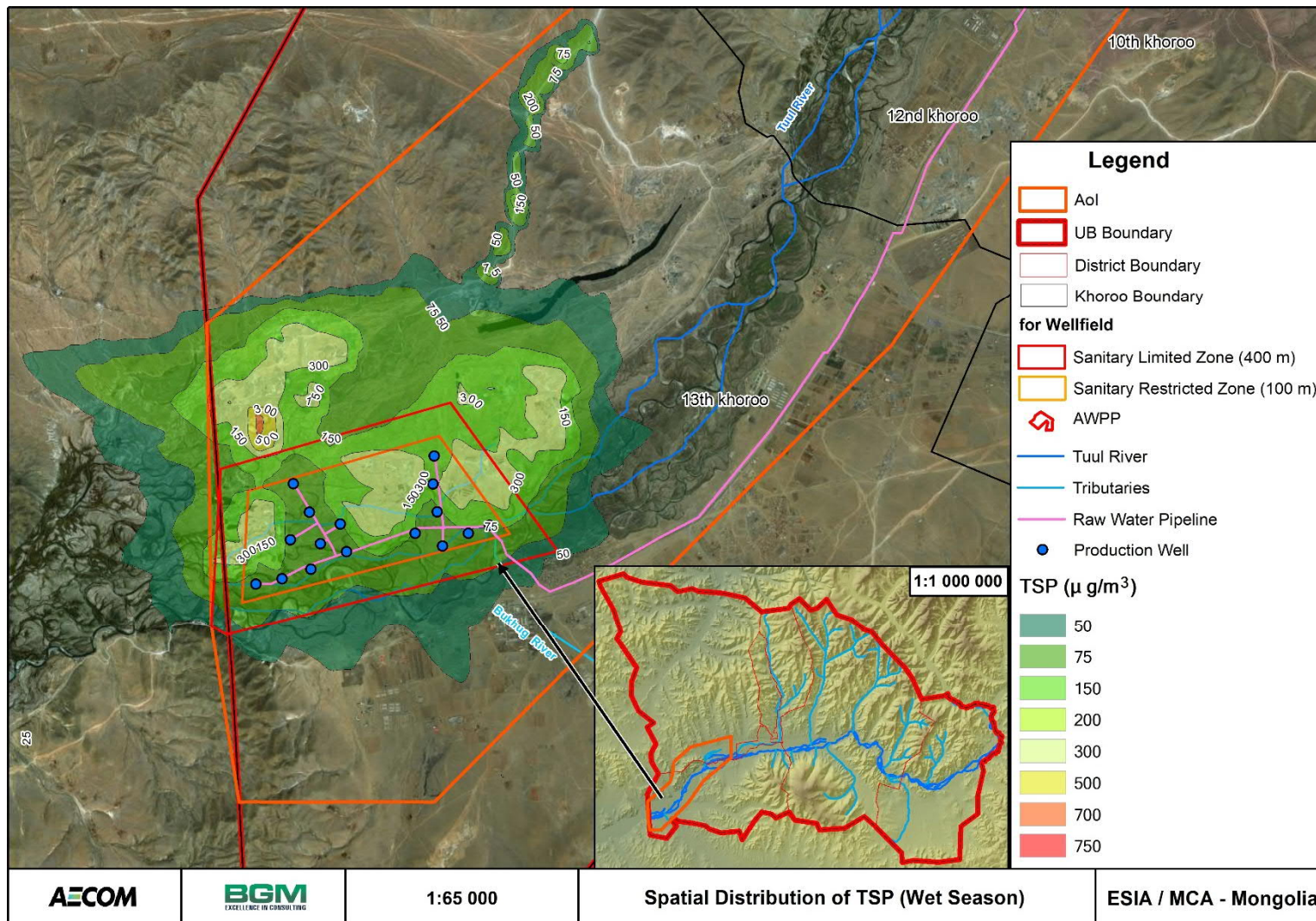


Figure 6-22 Spatial Distribution of TSP due to Gravel Mining Activities (dry season)





**Figure 6-23 Spatial Distribution of TSP due to Gravel Mining Activities (wet season)**

## 6.1.5 Greenhouse Gas Emissions

Total GHG emissions of Mongolia in 2014 were 34,482.73 Gg<sup>30</sup> CO<sub>2</sub>e<sup>31</sup> (excluding LULUCF<sup>32</sup>). This represents a 57.09 percent increase from the 1990 level of 21,950.73 Gg CO<sub>2</sub>e and 5.49 percent increase from the 2013 level with 32,687.27 Gg CO<sub>2</sub>e. Net GHG emissions in 2014 were 10,030.80 Gg CO<sub>2</sub>e (including LULUCF). This represents a 1,034.44 percent increase from the 1990 level of -1,073.46 Gg CO<sub>2</sub>e and 23.23 percent increase from the 2013 level with 8,139.60 Gg CO<sub>2</sub>e.<sup>33</sup> In general, GHG emissions and removals from each sector increased in 2014 compared to the base year 1990 and differences are shown in Table 6-6 by percentages and absolute values of each GHG inventory sectors.

**Table 6-6 Mongol's GHG Emissions/Removals by Sectors in 1990 and 2014**

Sector	Emissions and Removals (Gg CO <sub>2</sub> e)		Change from 1990 (Gg CO <sub>2</sub> e)	Change from 1990 (%)
	1990	2014		
<b>Energy</b>	11,091.14	17,267.79	6,176.64	55.69
<b>IPPU<sup>34</sup></b>	218.66	328.06	109.39	50.03
<b>Agriculture</b>	10,585.30	16,726.98	6,141.68	58.02
<b>Waste</b>	55.62	159.91	104.29	187.49
<b>Total (excluding LULUCF)</b>	21,950.73	34,482.73	12,532.00	57.09
<b>LULUCF</b>	-23,024.18	-24,451.93	-1,427.75	6.20
<b>Net total (including LULUCF)</b>	-1,073.46	10,030.80	11,104.26	1,034.44

In other words, GHG emissions in 2014 from the energy sector were 17,267.79 Gg CO<sub>2</sub>e accounting for 50.08 percent of total national emissions. The agriculture sector with 16,726.98 Gg CO<sub>2</sub>e accounts for 48.51 percent of the national total. Emissions from IPPU and Waste sectors contributed 328.1 Gg CO<sub>2</sub>e (0.95 percent) and 159.91 Gg CO<sub>2</sub>e (0.46 percent) respectively to the national total in 2014. The aggregated GHG emissions and removals by sectors between 1990 and 2014 are shown in Figure 6-24.

<sup>30</sup> Gigagram

<sup>31</sup> Carbon dioxide equivalent

<sup>32</sup> Land use, land-use change and forestry

<sup>33</sup> Mongolia's National Inventory Report, 2017: Annex to Initial Biennial Update Report to UNFCCC

<sup>34</sup> Industrial Processes and Product Use

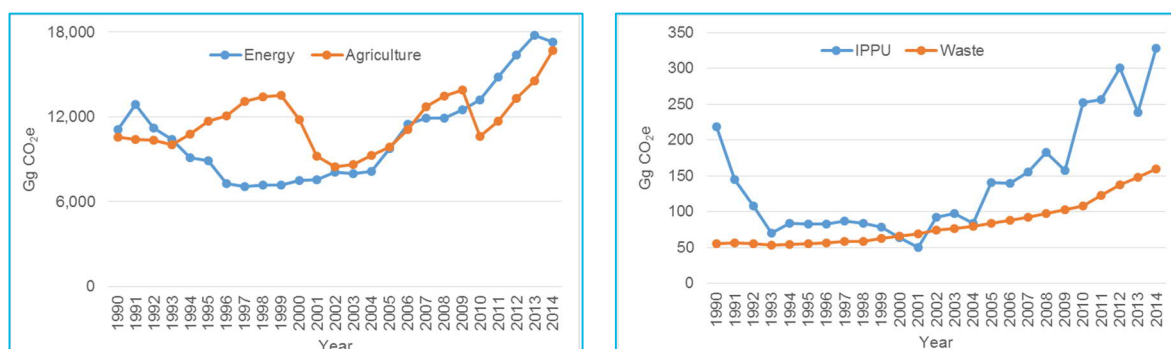


Figure 6-24 The Aggregated GHG Emissions by Sectors

Total emissions in the energy sector in 2014 increased by 55.69 percent compared to the base year 1990. A large part of emissions in energy sector comes from energy industries (e.g., electricity generation, electricity, and heat production in CHPs) source category as shown in Figure 6-25. Total emissions in the agriculture sector in 2014 increased by 58.02 percent compared to 1990; in particular, due to increasing the number of domestic livestock which increased 25.8 million in 1990 to 51.9 million in 2014 (see Figure 6-26).

The total GHG emissions of IPPU sector in 2014 increased by 50.03 percent compared to the base year 1990. The emission fluctuations in IPPU sectors are linked with the economic situation of the country. The main contributor to the total emissions from IPPU sector is the mineral industry (cement and lime production) and it represents 68.86 percent of emissions. The cement and lime are the important ingredients for the building materials production. The building material industry is growing in parallel with the population and the economy (see Figure 6-27).

Total aggregated emissions from the waste sector have increased by 187.49 percent between 1990 and 2014 (see Figure 6-28). From this analysis, the energy and agriculture sectors are the major source for emissions from 1990 to 2014.

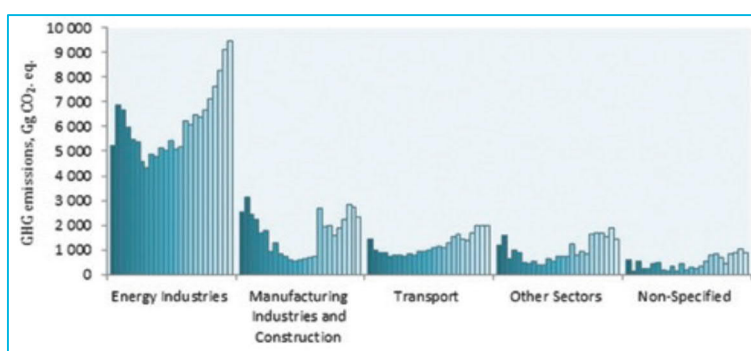


Figure 6-25 Trends in the Energy Sector by Categories (1990-2014)

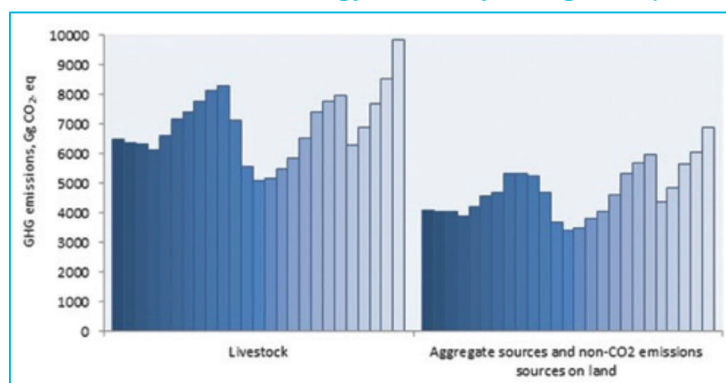


Figure 6-26 Trends in the Agriculture Sector by Categories, 1990-2014



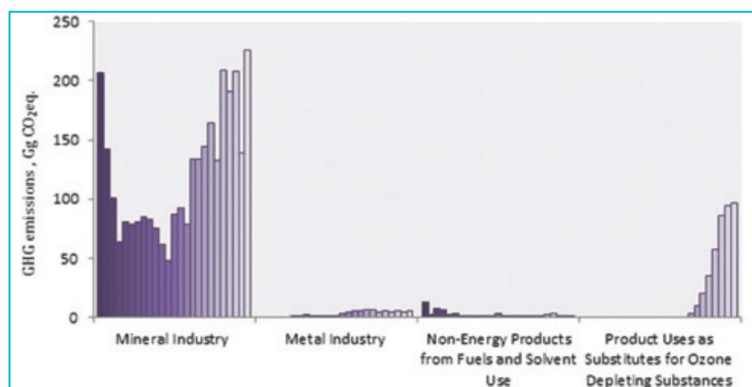


Figure 6-27 Trends in the IPPU Sector by Categories, 1990-2014



Figure 6-28 Trends in the Waste Sector by Categories, 1990-2014

### 6.1.5.1 Summaries of Trend of Main Greenhouse Gas

The changes of main GHG in Mongolia is summarized as below<sup>35</sup>:

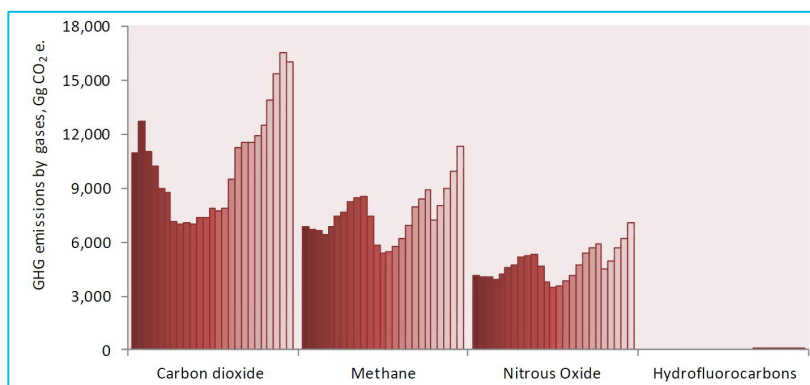
- **Carbon dioxide (CO<sub>2</sub>)**: The CO<sub>2</sub> emissions from all sectors (excl. LULUCF) increased by 46.46 percent from 1990 to 2014. The emissions from all (excl. LULUCF) increased from 10,927.61 in 1990 to 16,004.13 Gg CO<sub>2</sub>e in 2014 mainly due to higher emissions from energy sector. The main source of CO<sub>2</sub> emissions in Mongolia is the fossil fuel combustion. Within the fuel combustion category the energy industries is the most important sub-source with the growth of 81.92 percent from 5,178.13 Gg in 1990 to 9,420.14 Gg in 2014. The second contributor to CO<sub>2</sub> emissions is the manufacturing industries and construction source category with the decline of 8.65 percent from 2,519.05 Gg in 1990 to 2,301.20 Gg in 2014.
- **Methane (CH<sub>4</sub>)**: CH<sub>4</sub> emissions increased from 6,872.62 to 11,341.60 Gg CO<sub>2</sub>e with a growth of 65.03 percent from 1990 to 2014. The main sources of CH<sub>4</sub> emissions in Mongolia are the enteric fermentation in agriculture sector, the fugitive emissions from coal mining and handling, and solid waste disposal on land (landfills).
- **Hydrofluorocarbons (HFCs)**: The activity data for the estimation of HFCs emissions were available only from 2007 to 2014. Thus the emissions have been calculated for the period 2007-2014 and increased remarkably for this period from 3.17 to 96.43 Gg CO<sub>2</sub>e due to growth of imported refrigeration and air conditioning equipment.
- **Nitrous oxide (N<sub>2</sub>O)**: N<sub>2</sub>O emissions increased from 4,150.49 to 7,040.58 Gg CO<sub>2</sub>e for the period 1990-2014, which is 69.63 percent increase over the years. The main sources are: direct N<sub>2</sub>O emissions from managed soils; indirect N<sub>2</sub>O emissions from

<sup>35</sup> Mongolia's National Inventory Report, 2017: Annex to Initial Biennial Update Report to UNFCCC

managed soils; energy industries; manufacturing industries and construction; transport and residential sectors, and domestic wastewater treatment and discharge.

- **Nitrogen oxides (NO<sub>x</sub>)**: The NO<sub>x</sub> emissions caused by biomass burning in forest land decreased from 1.78 to 0.04 Gg CO<sub>2</sub>e, during the period from 1990 to 2014. The level of NO<sub>x</sub> emissions of 2014 were -97.75 percent below the level of 1990.
- **Carbon monoxide (CO)**: The main source of CO emissions is burning of biomass in forest land. The CO emissions decreased from 63.63 Gg in 1990 to 1.54 Gg in 2014 which are resulted from the biomass burning in the forest land. In 2014 the CO emissions were -97.58 percent below the level of 1990.

The trend of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions are presented in Figure 6-29.



**Figure 6-29 Trends of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O Emissions from 1990-2014**

### 6.1.5.2 Greenhouse Gas Reduction Policy of UB

In 2016, Mongolia ratified the Paris Agreement on Climate Change by developing an “Intended National Determined Contribution” (NDC) based on national and sectoral development policy documents and submittal it to UNFCCC Secretariat. The Mitigation target of Mongolia’s NDC will be a 22.7 percent reduction in total national greenhouse gas (GHG) emissions by 2030 compared to projected emissions under a 2015 business as usual scenario. In addition, if conditional mitigation measures such as the carbon capture and storage and waste-to-energy technology are implemented, then Mongolia could achieve a 27.2% reduction in total national GHG emissions. Along with that, actions and measures to remove GHG emissions by forest are determined, which set the total mitigation target of Mongolia as 44.9% of GHG emission reduction by 2030.

Mongolia’s NDC was approved with Government Decree No. 407 In November 2019.

UB is the capital and the largest city of Mongolia. The centralization of the main emitters such as coal-fired thermal power plants, and the large number of energy consumers in UB emphasize a significant role of UB in reducing GHG emissions. While large cities and urbanization are recognized as major sources of GHG emissions, residents of the urban areas with well-developed infrastructure are the most vulnerable to the climate change impacts.

The projections of the scenarios for the reduction of GHG emissions in UB requires comparison with the baseline and future scenarios of projection at the national level. The share

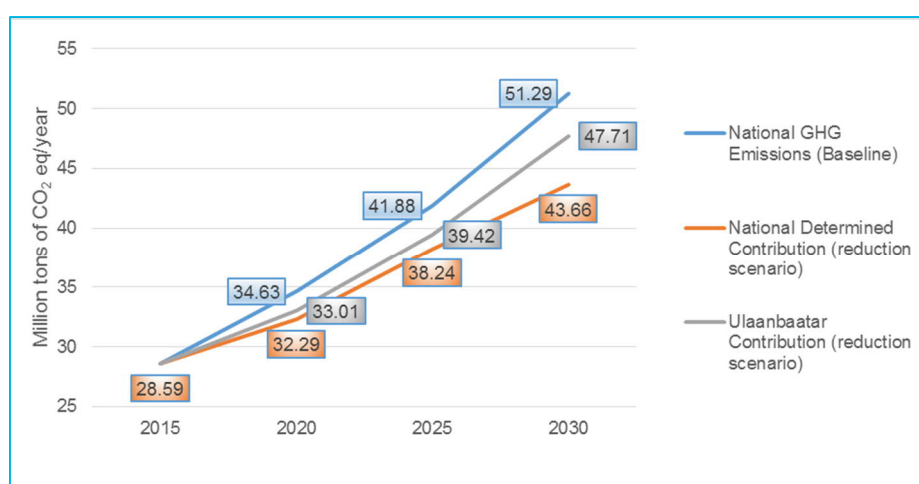
of the energy sector in the total GHG emissions is estimated at 70 percent and is expected to increase in the future<sup>36</sup>.

The calculation of the UB share in the NDC was based on the comparison with national level baseline scenarios estimated in 2016 is shown in Table 6-7.

**Table 6-7 Comparison of Scenarios of GHG Emissions Reduction in UB**

Measures	2015	2020	2025	2030
<b>Baseline</b>				
<b>Baseline of Mongolian NDC</b>	28,591	34,632	41,877	51,294
<b>Reduction of GHG emissions in UB city</b>				
<b>1. Improve the efficiency of electricity and heat production and distribution</b>	0.00	786.16	990.00	1280.69
<b>1.1 Reduce energy consumption for coal fired heating plants</b>	0.00	93.51	160.00	226.95
<b>1.2 Reduce electricity transmission and distribution losses</b>	0.00	276.95	370.00	417.94
<b>1.3 Reduce heat distribution losses</b>	0.00	385.70	420.00	583.80
<b>1.4 Improve the efficiency of heating boilers</b>	0.00	30.00	40.00	52.00
<b>2. Increase the efficiency of energy consumption</b>	0.00	480.00	638.00	825.60
<b>2.1 Support energy saving technology in large industries and services</b>	0.00	80.00	88.00	94.40
<b>2.2 Reduce building heat loss</b>	0.00	400.00	550.00	731.20
<b>3. Reduce emissions in the transportation sector</b>	0.00	150.00	435.00	880.00
<b>4. Increase the share of renewable resources in the total installed capacity of the national energy generation</b>	0.00	200.00	400.00	594.00
<b>Total GHG reduction</b>	0.00	1616.16	2463.00	3580.29

As shown in Table 6-7, the share of UB in Mongolia's NDC commitment to reduce GHG emissions is estimated at 3,580 thousand tonnes of CO<sub>2</sub>-eq / year by 2030, representing about 7 percent of the total contributions of the country. Figure 6-30 shows the comparison of the baseline scenario projections on reduction of GHG emissions at national and UB level. The climate change mitigation measures in UB are recommended to reduce buildings heat loss, reduce heat and electricity distribution losses, and increase efficiency in the transportation sector.



**Figure 6-30 Baseline and GHG Reduction Scenarios**



## 6.1.6 Geology and Hydrogeology

The geological formations and tectonic conditions that control the hydrogeology in the UB region, which comprises both the Tuul River Valley and the surrounding mountains and hillsides, are complex. The Aol for geological and hydrogeological condition is explained in Section 6.1.8. The following metamorphic-sedimentary rocks and unconsolidated materials have been recognized in the region (see Figure 6-31):

1. Middle and late Devonian age metamorphic-sedimentary rocks, Gorkhi Formation (D2-3gr), deposited roughly 360 to 390 million years ago
2. Early-middle Carboniferous age Terrigenous metamorphic-sedimentary rocks, Altan-Ovoo Formation (C1-2ao), deposited roughly 320 to 360 million years ago
3. Early-middle Carboniferous age metamorphic-sedimentary rocks, Orogchin Mountain Formation (C1-2or), deposited roughly 320 to 360 million years ago
4. Neogene-Pleistocene age, poorly consolidated alluvium, Gashuun Formation (N2g), deposited perhaps 2.5 to 5 million years ago
5. Late Quaternary (Pleistocene-Holocene) age diluvia-proluvia, unconsolidated alluvia (d-plQ1-2), deposited roughly in the last 0.5 to 1 million years
6. Modern Quaternary-Holocene unconsolidated alluvium (allQ2), deposited in the last 12,000 years

The Devonian and Carboniferous rocks are exposed in the mountains and hillsides above the Tuul River Valley. The valley is the result of rifting of the earth's crust, wherein Devonian and Carboniferous rocks were pulled apart, causing a down-drop of the crust. Rifting probably occurred in the Cenozoic Era, which began around 65 million years ago. The alluvial, diluvial, and proluvial deposits fill the lowest parts of the Tuul River Valley, and they bury the much older Devonian and Carboniferous rocks.

The western wellfield areas of Biokombinat and Shuvuun, where AECOM conducted hydrogeological investigations in 2019, are underlain largely by the Quaternary-Holocene alluvial deposits.

### 6.1.6.1 Alluvial Aquifers

Using the findings of the 2019 study and previous studies on hydrogeological conditions, the Geophysical-Hydrogeological Investigation Final Report (AECOM, 2019a) describes these sedimentary rocks and unconsolidated materials based on overall geological structure, lithological composition and age, water-bearing properties, aquifer type and capacity, groundwater recharge source and rate, and potential pumping rate (see Figure 6-32). The proposed BWSE would withdraw groundwater directly from the Quaternary-Holocene alluvial aquifer (allQ<sub>2</sub>) and indirectly from the Pleistocene-Holocene alluvial aquifer (d-plQ<sub>1-2</sub>). The Neogene-Pleistocene alluvium and the metamorphic-sedimentary rock units also provide recharge, although the proportion has not been quantified.

The **Quaternary-Holocene alluvial aquifer** is the main and most reliable source of UB water supply. The hydrogeological investigations in 2019 in the Biokombinat and Shuvuun areas made the following findings regarding the alluvial aquifer (AECOM, 2019a):

#### Biokombinat

- Thickness of alluvial aquifer sediment ranges from 35 to 70 meters
- Static water level ranges between 0.59 and 1.66 meters below the surface
- During constant-rate pumping tests at rates of 33 and 65 liters per second, the observed water level drawdown ranged from 1.72 to 4.58 meters
- Long-term drawdown predicted to range from 0.55 to 3.30 meters

- Hydraulic conductivity ranges from 26 to 202 meters per day

### **Shuvuun**

- Thickness of alluvial aquifer sediment ranges from 50 to 60 meters
- Static water level varies seasonally, typically fluctuating from 0.81 to 2.25 meters below the surface during summer/autumn and 2.4 to 4.7 meters during winter/spring
- During constant-rate pumping tests at rates of 33 and 65 liters per second, the observed drawdown ranged from 0.69 to 6.24 meters, with dynamic pumping levels of 1.59 to 7.53 meters
- Hydraulic conductivity ranges from 31 to 112 meters per day

Groundwater recharge to the alluvial aquifer originates from a combination of infiltration of surface water, direct infiltration of precipitation, lateral groundwater flow originating from contiguous alluvium in tributary valleys, and lateral groundwater flow originating from fractures in bedrock along the valley walls and beneath the tributary valleys (AECOM, 2019a).

Groundwater from the **Pleistocene-Holocene alluvial aquifer** contributes to the Holocene alluvial aquifer (AECOM, 2019a). The total thickness of the aquifer formation ranges from 19.5 to 33.5 meters, and groundwater is encountered in this formation at a depth of 0.2 to 11.3 meters, but mainly is found at depths of 4 to 6 meters. The groundwater has higher chloride and sulfide levels compared to the overlying Quaternary-Holocene alluvial aquifer, and sometimes contains nitrogen levels that exceed the drinking water standards. Groundwater in the aquifer is fed by infiltration of precipitation falling in the watershed, and unevenly distributed groundwater flow originating from the metamorphic-sedimentary rocks distributed at higher elevations.

#### **6.1.6.2 Permafrost**

Geocryology in UB consists of seasonal frozen ground within valley bottoms and basins. Permafrost may occur discontinuously throughout the Aol; however, the specific distribution of permafrost is unknown. Areas to the south of the Tuul River within UB have more prevalent permafrost (Sodnom et al., 2005). Figure 6-33 shows permafrost distribution in UB city. The proposed BWSE project facilities would be constructed in areas with sparsely distributed, isolated occurrence of permafrost.

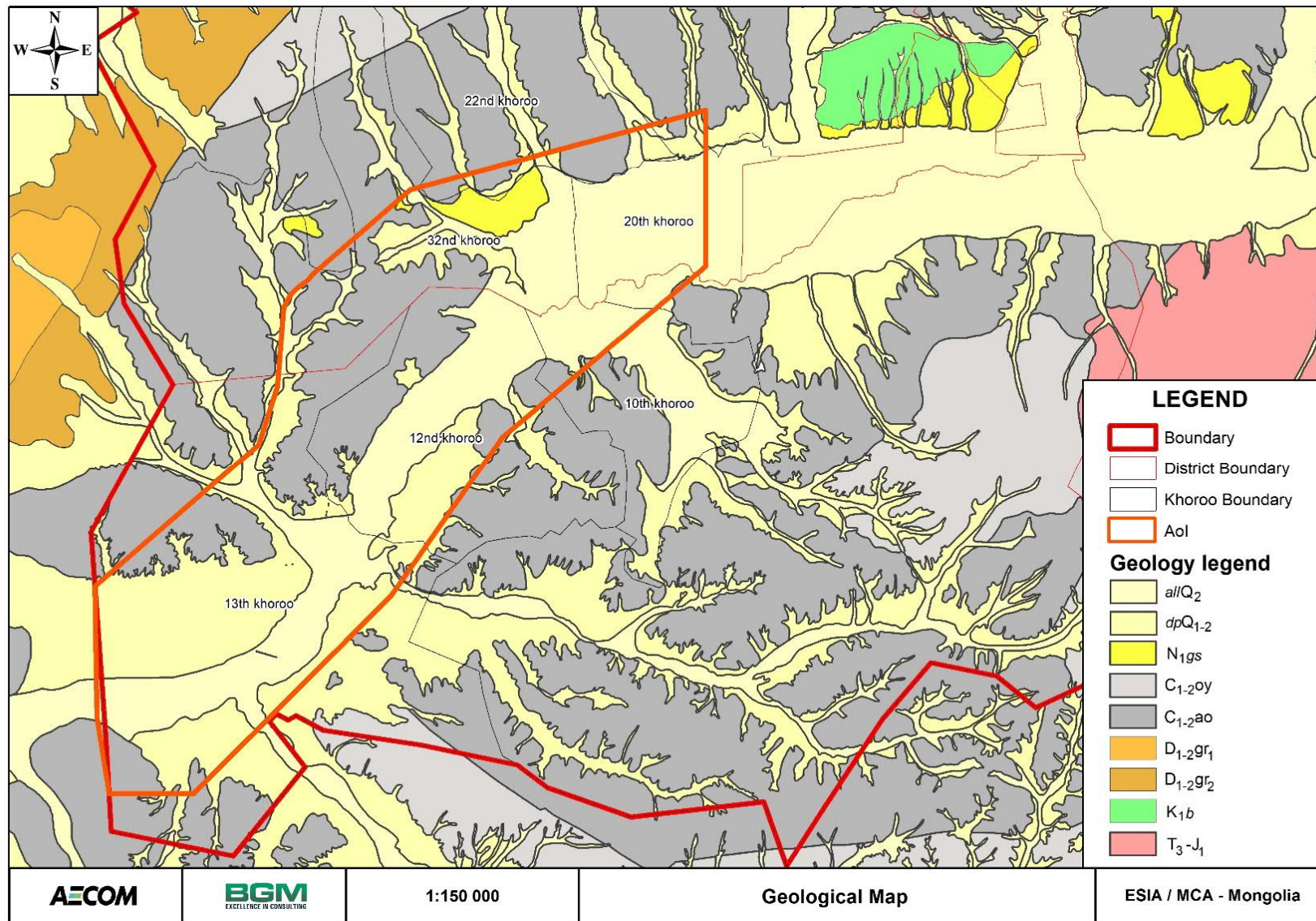


Figure 6-31 Geological Setting Map of the Aol and downstream of UB city



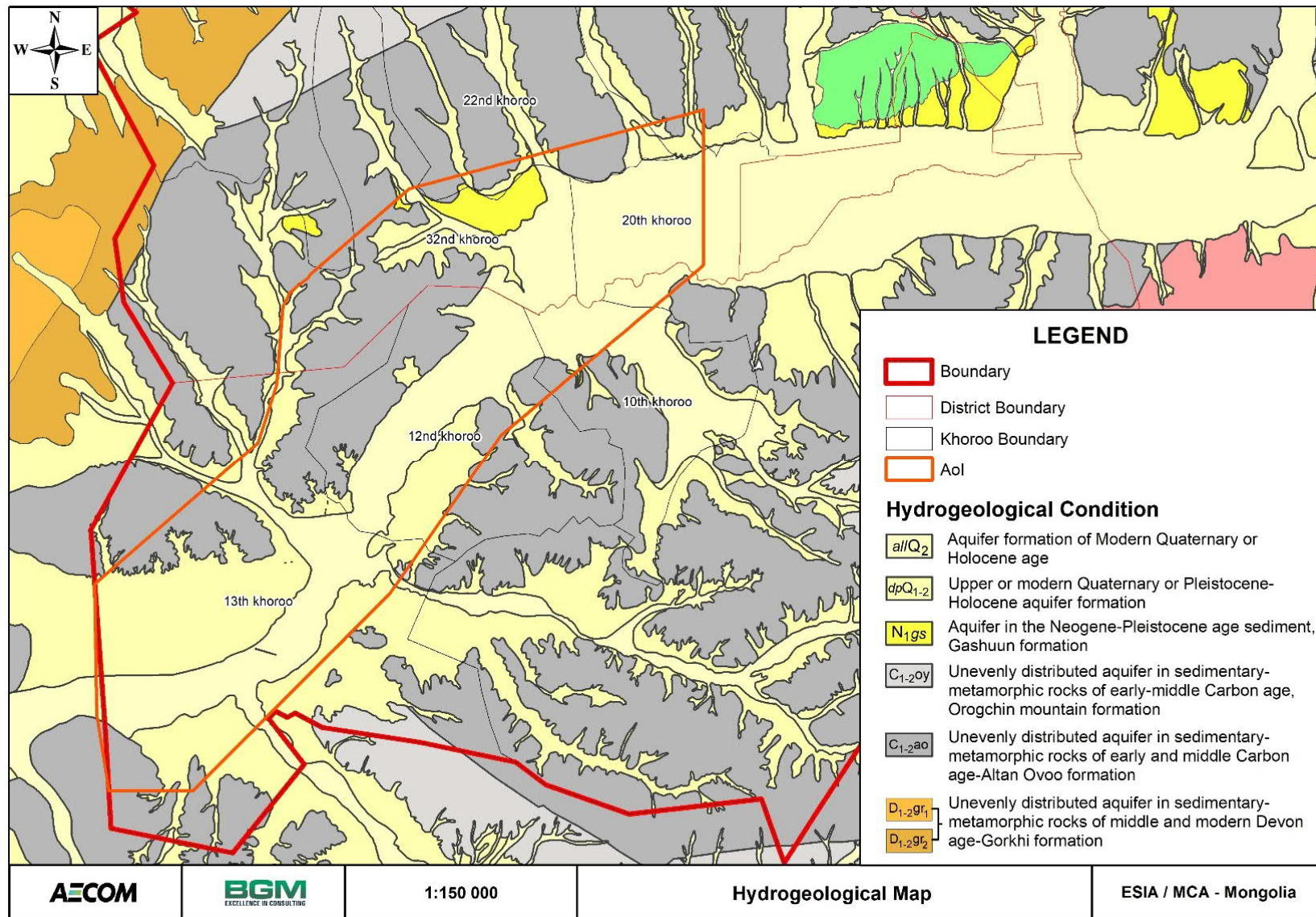


Figure 6-32 Hydrogeological Map of Aol and downstream of UB city

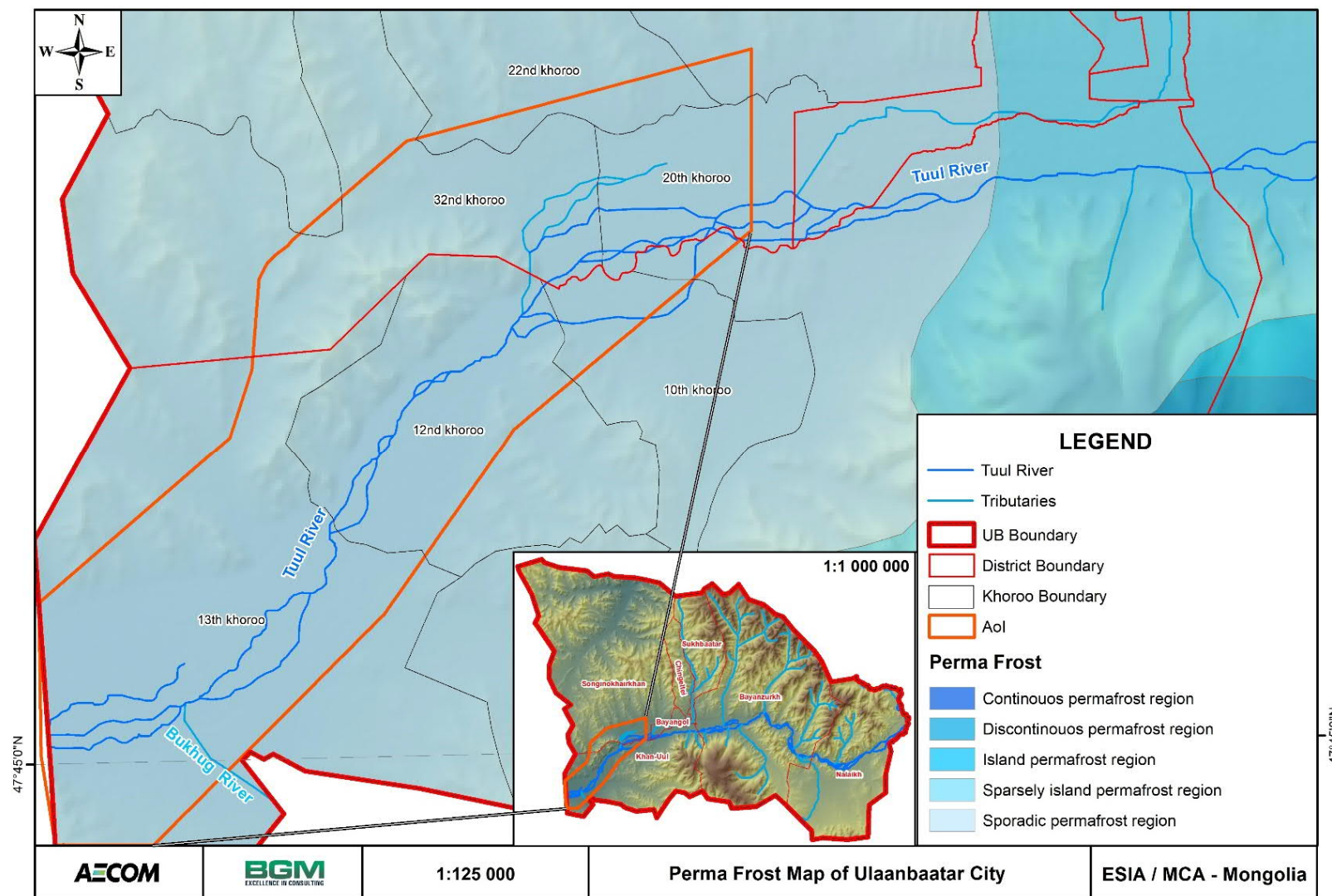


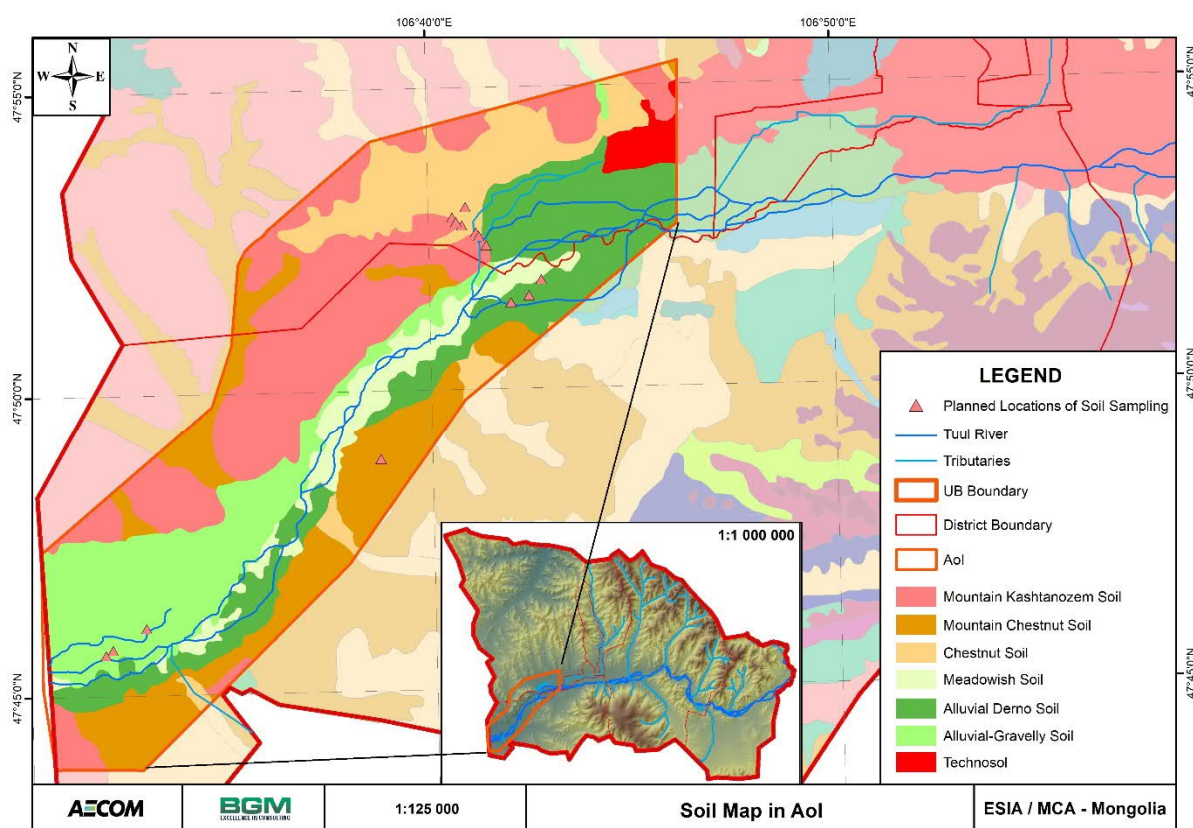
Figure 6-33 Permafrost Distribution in Aol and downstream of UB City



## 6.1.7 Soil

The dominant soil formations of the Tuul River Basin are high mountain and mountain taiga soil; middle and low mountain chestnut soil; steppe chestnut and dark chestnut soil; and meadow and river valley soil (MEGD, 2012). Soils occurring in forest-steppe and steppe regions of Mongolia are typically chestnut-colored soils in the Kastanozem group (Tamura et al., 2013).

Geographical distribution of soil types (with a scale of M1: 200,000) in downstream vicinity of UB city, where the BWSE project would be implemented, are shown in Figure 6-34 (Batkhisig et al., 2019). Soil sampling locations were carefully identified to be representative of each soil type in the overall Aol with 17.898 hectares.



**Figure 6-34 Geographical distribution of soil types in downstream vicinity of UB**

The soil sampling was conducted at the end of July 2019. The soil sampling locations are shown in Figure 6-36. Mountain-steppe brown soil is distributed over the eastern slopes of Songinokhairkhan Mountain, where the AWPP would be located. For this area, five soil samples were collected in different locations to determine soil properties and seven soil samples were prepared and sent for laboratory<sup>37</sup> analysis (see Figure 6-35).

The Shuvuun and Biokombinat wellfields and the water conveyance pipelines from the wellfields are located within riparian areas of the Tuul River, where the alluvial meadow soil is predominant. Seven soil samples were collected in these areas and 13 soil samples were prepared and sent to the laboratory for analysis (see Appendix D).

<sup>37</sup> Engineering Geodesy LLC with all necessary licenses





**Figure 6-35 Soil Sampling Field Survey at AWPP Site**

#### **6.1.7.1 Characteristics of Mountain-Steppe Chestnut Soil**

The mountain and steppe chestnut soils are mainly dominant in areas surrounding Songinokhairkhan Mountain, located on the western (right) bank of the Tuul River within the Aol. Thin chestnut soils occur on the lower slopes of Bogdkhan Mountain along the eastern floodplain of the Tuul River, with sandy dark soils in the intervalley areas of the mountain. The type of mountain-chestnut soil present formed under the grassland and meadow vegetation on side slopes and ridgetops of higher mountains.

Soil sampling was performed on the eastern side of Songinokhairkhan Mountain (see Figure 6-37). In this area, soil horizons were clearly differentiated by the humus layer in the A horizon) and carbonate accumulation in the BC horizon (see Table 6-8).

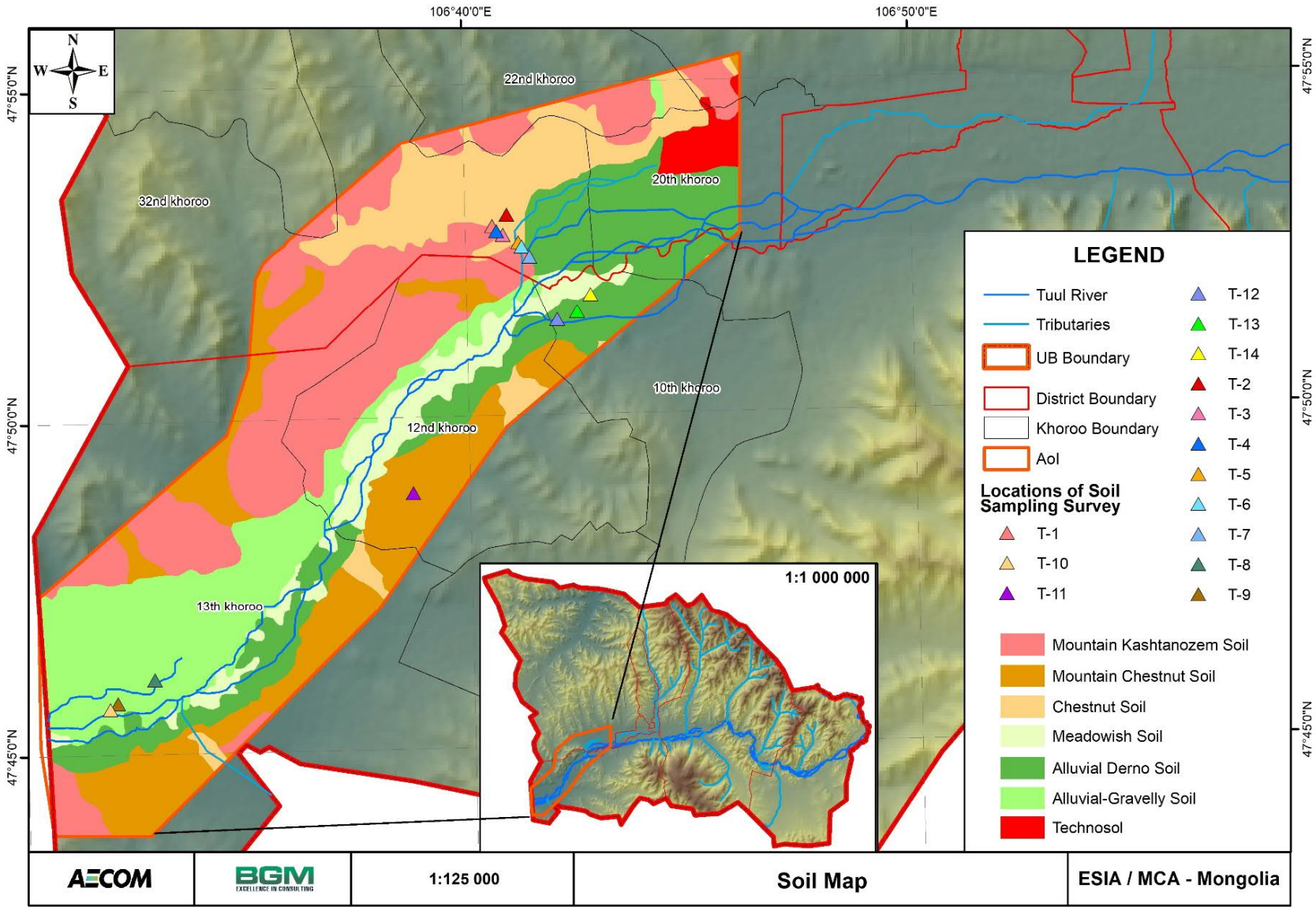


Figure 6-36 Soil Sampling Locations

The soil is stabilized on sediments to depths of 30 to 40 centimeters with eluvium-deluvium sediment of gravel with normal accumulation of powder carbonates.



**Figure 6-37 View of Eastern Side of Songinokhairkhan Mountain**

**Table 6-8 Soils at AWPP Site with Description**

	A (0 to 15 centimeters):	Brown (10YR-4.4), common very fine to fine roots. Slightly moist, without stone and gravelly, low density with sand dominated horizon, vertical fault from seasonal freezing. Particles were loamy sand. Gradual smooth boundary with color and density.
	AB (15 to 40 centimeters):	Dark brown (10YR-5.6), moist, particles were loamy sand, few fine roots, low density with sub-angular structure and very friable, abrupt smooth.
	B (40 to 60 centimeters):	Bright yellowish brown (5YR-7.6), dry, loamy clay and silt dominated particles, high density from deposited, few roots. Varisized gravel and fine sand and loose consisted. Light color from salt and carbonate deposition.

#### 6.1.7.1.1 Chemical Characteristics

The mountain-steppe chestnut soil and its subtypes are dominant on eastern side of Songinokhairkhan Mountain, where the AWPP would be built. According to the laboratory analysis, the humus content is around 2.0 percent, ranging from 2.2 percent in the A horizon to 1.5 percent in the AB horizon. The medium is alkaline with a potential of hydrogen (pH) of 6 to 8. The soil washed by rainfall has resulted in such alkalinity levels. The easily soluble



content of salt varies around 0.06 to 0.1 deciSiemens per meter<sup>38</sup>, and the residual salinity ranges between 0.2 and 0.8 percent respectively (see Table 6-9).

**Table 6-9 Chemical Properties of Mountain-Steppe Chestnut Soil**

Horizon	Depth (cm)	Humus %	pH	EC dS/m	Salinity %	CO <sub>2</sub>	NO <sub>3</sub>	Absorbed		Mobile		
								Ca+Mg	Ca	Ca+Mg	Ca	Ca+Mg
<b>Mountain-steppe chestnut soil</b>												
<b>A</b>	0-15	2.20	6.30	0.06	0.03	0.00	3.64	27.10	15.60	11.50	2.40	32.00
<b>AB</b>	15-40	1.79	7.50	0.10	0.04	0.00	4.02	19.10	14.00	5.10	1.50	21.00
<b>B</b>	40-60	1.62	8.00	0.07	0.03	0.00	3.44	17.60	16.90	0.70	1.20	12.00
<b>Chestnut soil affected by human activities</b>												
<b>A</b>	0-15	1.82	7.20	0.06	0.03	0.00	4.58	19.00	15.90	3.10	1.60	23.00
<b>Gravel chestnut soil</b>												
<b>A</b>	0-20	1.99	7.00	0.17	0.08	0.00	5.57	18.00	13.80	4.20	1.70	10.00
<b>Chestnut soil of intervalley areas</b>												
<b>A1</b>	0-20	2.27	6.70	0.05	0.02	0.00	4.51	21.90	18.70	3.20	2.10	27.00
<b>AB</b>	20-40	2.18	7.30	0.07	0.03	0.00	3.78	23.60	17.20	6.40	1.90	29.00
<b>B</b>	0-30	1.22	7.80	0.22	0.11	0.00	2.55	18.20	14.20	4.00	1.30	18.00

**Notes:** cm indicates centimeters; EC indicates electrical conductivity; dS/m indicates deciSiemens per meter.

#### 6.1.7.1.2 Physical Characteristics

Steppe dark chestnut soil is formed on gravelly proluvial-deluvial deposits accumulated as a result of landslide and contains a clay layer of carbonate during its evolution.

The steppe dark chestnut soil around the Aol is 60 percent sand, 30 percent silt, and 10 percent clay. The proportion of sand and clay may change with distribution of the soil.

According to the mechanical composition analysis, the soil distributed on slopes of the mountain is dominated by the sand fraction with a variety of sizes (2 to 0.05 millimeters) reaching 40 to 60 percent of the total composition. Horizon B (0.05 to 0.002 millimeters) has a content of up to 40 percent silt. For mountain chestnut soil, the content of fine clay (greater than 0.002 millimeters) does not exceed 10 to 15 percent (see Table 6-10 and Figure 6-38).

**Table 6-10 Physical Properties of Mountain-Steppe Chestnut Soil**

Horizon	Mechanical composition – diameter (mm), %					Soil texture
	1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	
Mountain-steppe chestnut soil						
A	5.60	37.00	40.20	7.60	7.40	Clay
AB	11.50	39.20	31.50	11.00	3.50	Sandy
B	17.00	40.00	23.30	8.10	5.50	Clay
Chestnut soil affected by human activities						
A	13.70	50.30	20.40	1.70	6.40	Sandy
Gravelly chestnut soil						
A	6.30	34.30	37.50	10.50	6.10	Clay
Chestnut soil of intervalley areas						
A1	10.70	39.90	29.70	12.80	5.10	Clay

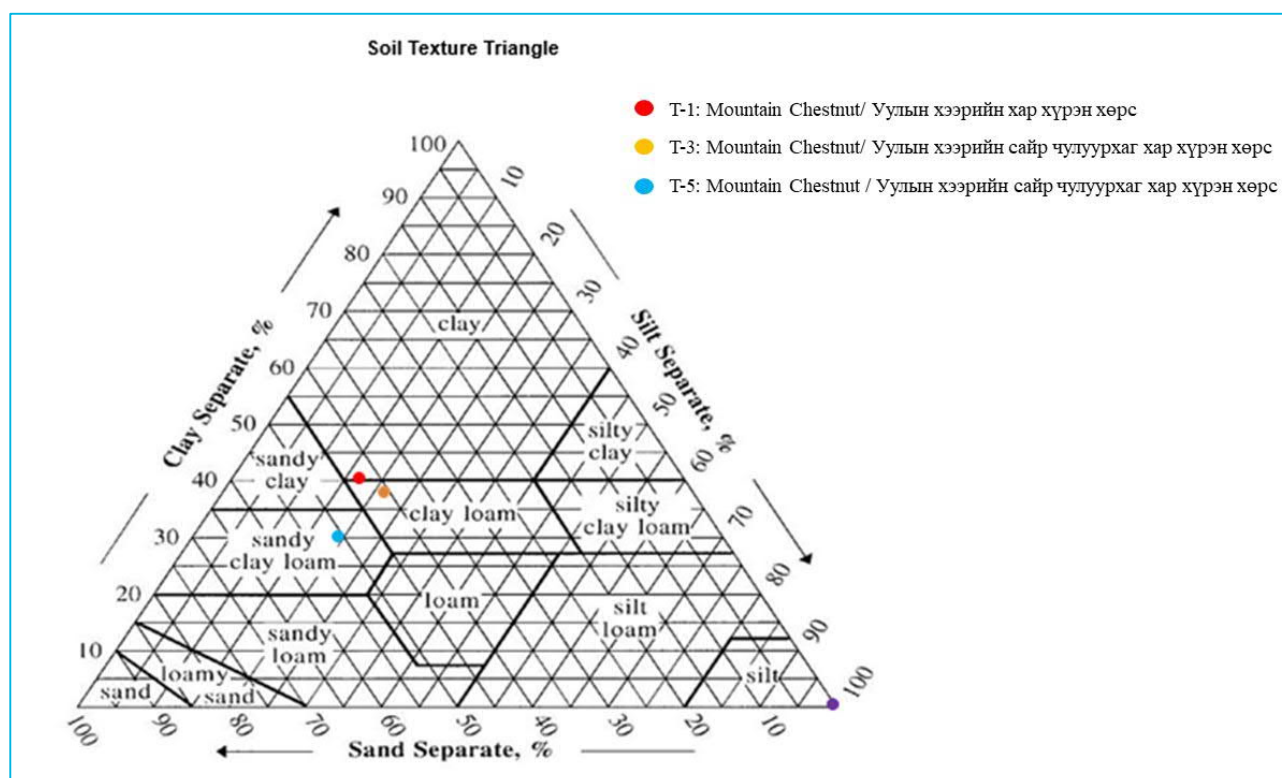
<sup>38</sup> Soil salinity, as well as water salinity, often is measured by electrical conductivity; deciSiemens per meter is a commonly used electrical conductivity unit.

Horizon	Mechanical composition – diameter (mm), %					Soil texture
	1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	
AB	11.60	37.00	34.30	11.90	13.20	Clay
B	0.70	49.30	28.60	8.50	8.10	Clay

**Note:** mm indicates millimeters.

Soil formation in mountain areas has been directly influenced by gravity transport of particles along steep slopes, and also results from geochemical processing to create the silty particles in the soil profiles. The mountain chestnut soil particles evidence deposition of sand particles from sediment transport and silt formation from geochemical processing.

Mountain chestnut soil T-1 shown in Figure 6-38 is located on the back slope of the mountain, and the soil profile developed with thin layers and high content of gravels and stones. The particle size shows that sand and clay dominate in the soil profiles; the soil texture triangle showing the clay/clay loam texture of T-1 and clay loam texture of T-3 on steep slopes. Soil T-5 is located on or near the pediment of the mountain, and particle sizes developed from diluvium sediment deposition from the mountain slopes. The soil triangle shows soil T-5 having sandy clay loam texture.



**Figure 6-38 Soil Texture of Mountain Chestnut Soil**

### 6.1.7.2 Alluvial Meadow Soil

Alluvial meadow soil is distributed on hump and hollow areas around the Tuul River. The soil is formed on alluvial sandy-gravel deposits with higher sand composition. The grassy, steppe and meadow steppe soils are prominent, with 50 to 70 percent vegetation cover. The soil type is widespread on the proposed Biokombinat and Shuvuun wellfields, where new wells and pipelines would be installed. Alluvial soil sampling was performed at three locations at the Shuvuun wellfield to identify the characteristics of the alluvial soil that would be disturbed.

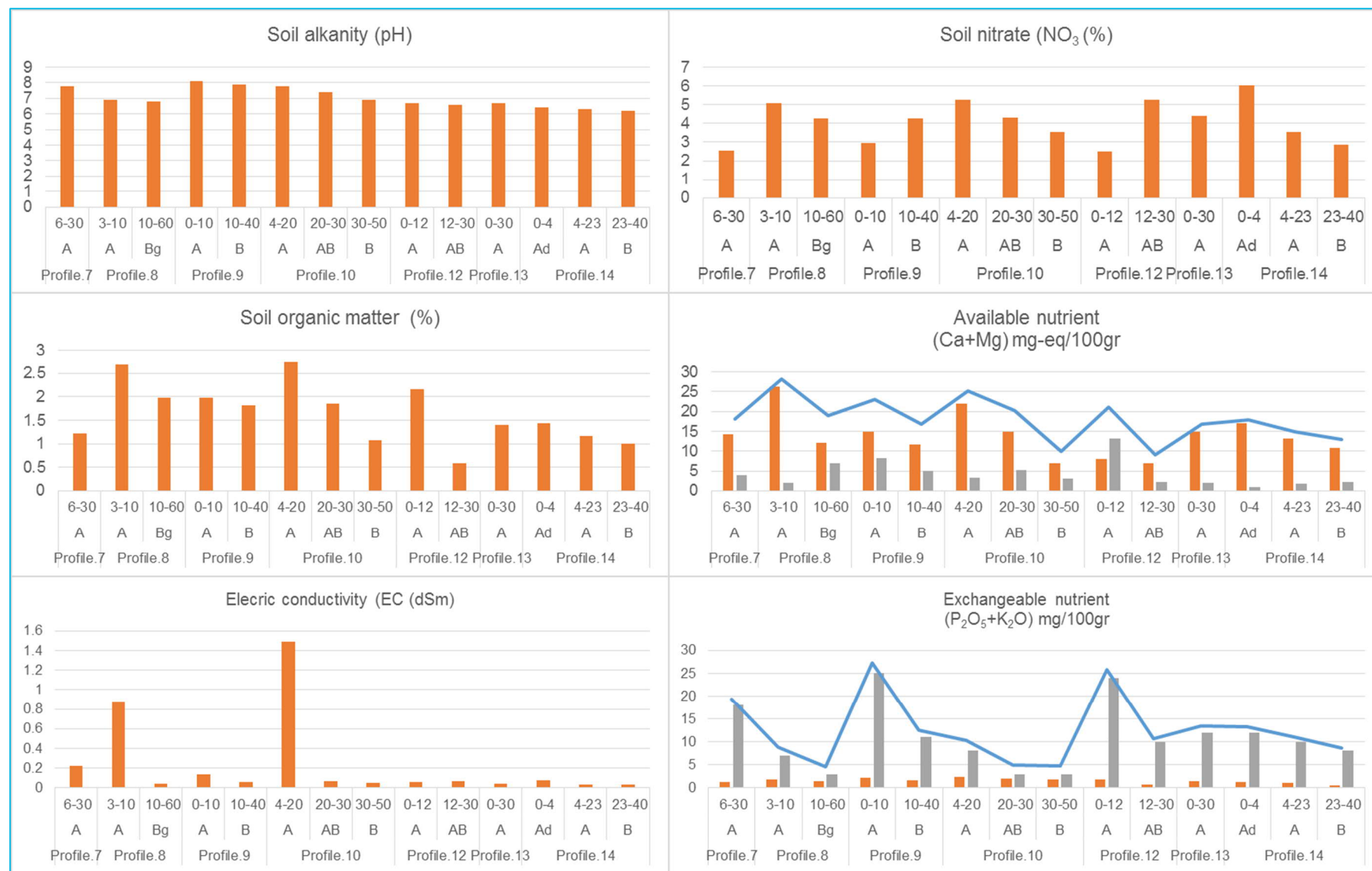
#### 6.1.7.2.1 Chemical Properties

Based on soil chemistry analysis, humus content in the alluvial meadow soils on the proposed wellfield sites fluctuates greatly. Humus content ranges between 1.5 and 2.5 percent at the Shuvuun wellfield site. However, the range is less than 1.5 percent in soil at the Biokombinat wellfield site. The concentration of mobile phosphorus (as  $P_2O_5$ ) and potassium ( $K_2O$ ), required for vegetation growth, can fluctuate significantly. Concentrations reach 18 to 25 milligrams per 100 grams in the topsoil but decrease sharply to less than 10 milligrams per 100 grams in lower soil layers.

The concentration of mobile chemical compositions in the alluvial meadow soil samples ranges from 10 to 30 milliequivalents per 100 grams, with the lowest value in the soil at the Biokombinat wellfield site. The concentration of absorbed base in upper soil layers is about 20 milliequivalents per 100 grams, and sharply reduces to 16.8 in bottom layers. The pH in the soil is relatively high at 7.9 to 8.0; however, due to high moisture in the soil, acidity is lower.

With regard to moisture availability, the content of easily soluble salt is low. According to the analysis, the salt concentration measured in terms of electrical conductivity ranges between 0.06 and 0.14 deciSiemens per meter. The electrical conductivity of the soil at the Biokombinat wellfield site is 1.49 deciSiemens per meter. The soil does not contain carbonate and the dry salt residue varies between 0.03 and 0.06 percent (Figure 6-39).





**Figure 6-39 Chemical Properties of Alluvial Meadow Soil**

### 6.1.7.2.2 Physical Properties

The alluvial meadow soil is thin and stratified by sandy loams. Soil composition is predominantly sands and silts. Soil layers other than the meadow humus layer are not morphologically clear, although the textures are characterized generally as light clay and sand, and loamy and clay soil is absent.

Laboratory analysis of the alluvial meadow soil shows that the sand fraction, with a variety of sizes (2 to 0.05 millimeters), occupies 50 to 60 percent of the total composition. Silt content with diameters of 0.05 to 0.002 millimeters represents less than 30 percent and fine clay (greater than 0.002 millimeters) content is less than 10 percent (Figure 2-38).

**Table 6-11 Physical Properties of Alluvial Meadow Soil**

Horizon	Mechanical composition – diameter (mm), %					Soil texture
	1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	
Alluvial demo soil –with gravel						
A	7.60	40.60	27.40	7.60	9.20	Clay
Bg	4.40	55.40	24.10	8.80	3.80	Sandy
Alluvial demo soil-with sandy						
A	5.40	52.10	24.50	5.90	7.50	Sandy
B	8.20	52.90	23.60	4.70	6.20	Sandy
Alluvial demo soil						
A	24.70	33.30	25.40	9.00	5.70	Clay
AB	39.90	41.80	8.60	1.80	5.10	
E	16.30	31.40	29.60	4.30	6.70	
Alluvial meadow soil						
A	27.30	43.70	18.30	1.20	4.00	

**Note:** mm indicates millimeters.

As shown in Figure 6-40, the particle size distribution in alluvial meadow soil evidences deposition from flooding and fluvial processes. Fine particles were deposited from flowing river water, and clay and silt particles were deposited from flooding and related processes. Additionally, seasonal freezing and permafrost directly affected the fine particle distribution in the soil profiles. All samples of alluvial meadow soil were classified sandy clay loam in soil texture triangle, with one sample classified marginally as sandy loam.

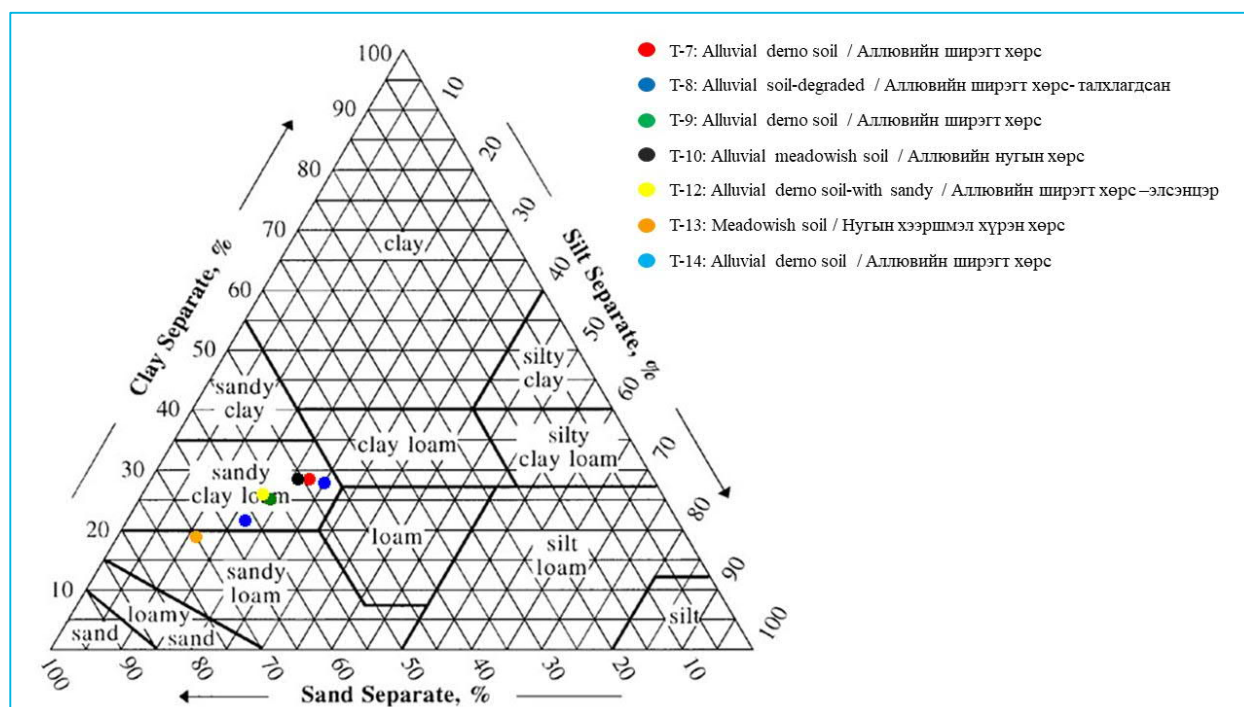


Figure 6-40 Soil Texture of Alluvial Meadow Soil

### 6.1.7.3 Technosols

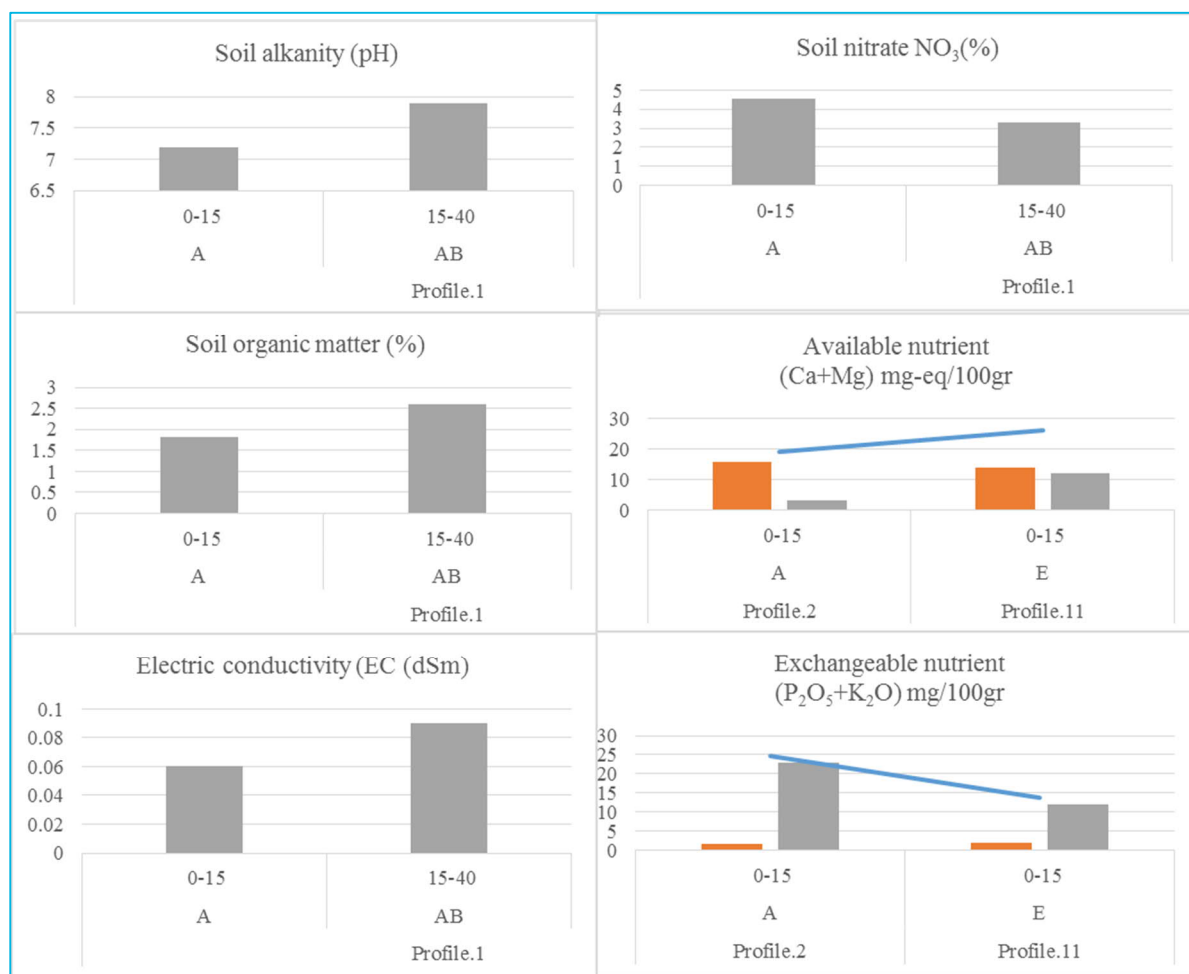
Increasingly, over the past several decades, mining, transportation, industry, and other human activities have altered fertile topsoil in the fringes or peri-urban areas of UB city. As a result, the extent of technosols has increased from year to year. Technosols are soils whose properties, formation, and development are dominated by their technical origin (IUSS Working Group WRB, 2015). Typically in UB, technosols were formed by depleting the upper layer of low-fertility soils, and spreading and mixing in manure; thereby, creating fertile topsoil on depleted soil.

#### 6.1.7.3.1 Chemical Properties

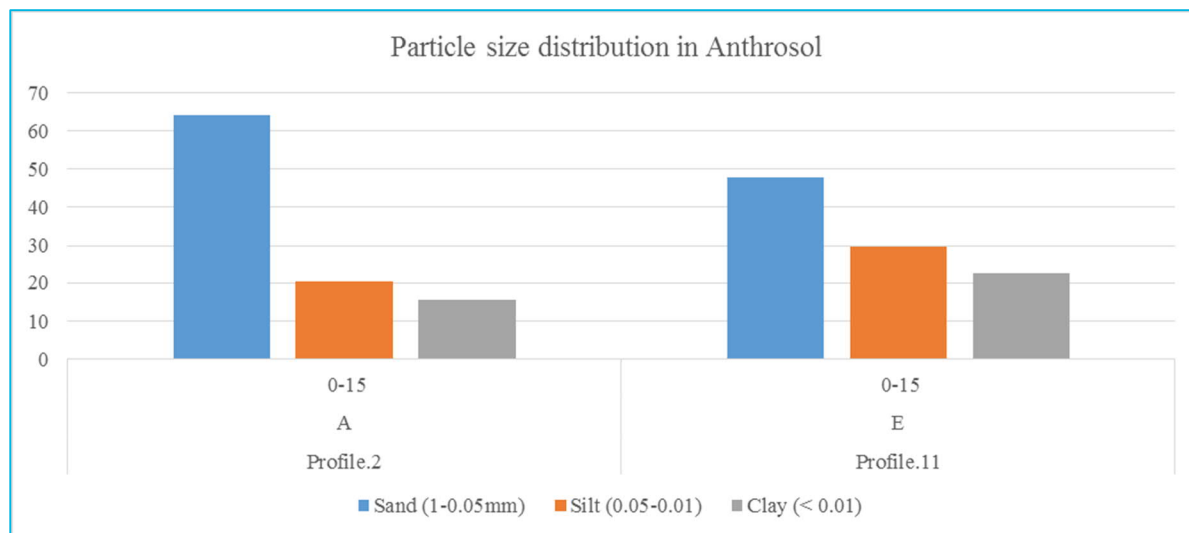
Based on laboratory analysis, the humus content of the technosol soil from AWPP site and along raw water pipeline is 1.8 to 2.5 percent, and the amount of mobile phosphorus (as  $P_2O_5$ ) and potassium ( $K_2O$ ) is 13 to 20 milligrams per 100 grams. Other fertility indicators account for 18 to 26 milliequivalents per 100 grams. The pH of the technosol soil is neutral or weakly alkaline (pH 7 to 7.6), with easily soluble salt content of 0.06 to 0.08 deciSiemens per meter and a carbonate content of less than 0.9 percent (see Figure 6-41).

#### 6.1.7.3.2 Physical Properties

Based on laboratory analysis, the composition of the technosol soil is 60 percent sand, 20 percent silt, and 10 percent clay. The sand fraction ranged from 50 to 70 percent, with the proportion of sand fraction sized 2.0 to 0.05 millimeters dominating at 50 to 60 percent of the total profile. Silt content (0.05 to 0.002 millimeters) is 30 percent and the fine clay (greater than 0.002 millimeters) content is less than 10 percent (see Figure 6-42).



**Figure 6-41 Chemical Properties of Technosols**



**Figure 6-42 Physical Properties of Technosols**

As shown in Figure 6-43, the technosol soil samples from degraded areas was classified as sandy clay loam, and small and fine particles dominate the soil profiles. Anthropogenic alteration has affected the topsoil properties, reducing organic matter and other nutrients to fine particles, which are emitted as particle matter (dust) into the air.

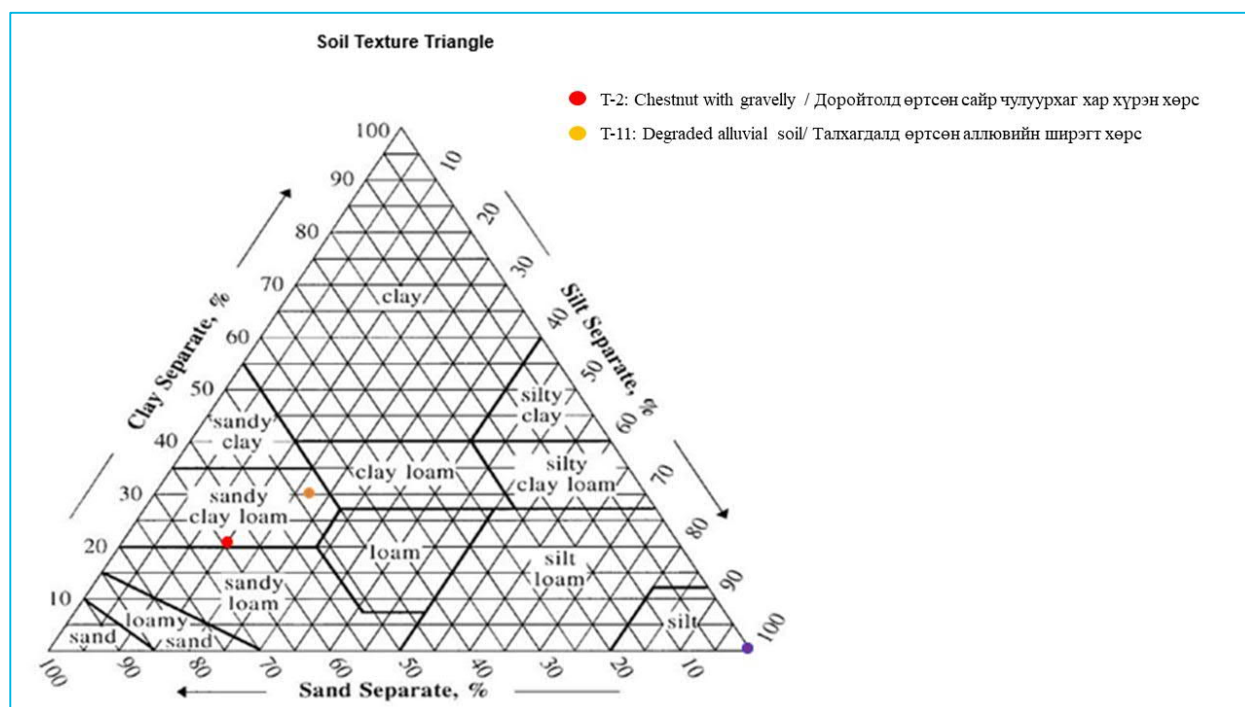


Figure 6-43 Soil Texture of Technosol in Tuul River Valley

#### 6.1.7.4 Soil Organic Matter

The soil organic matter (SOM) is main indicator of soil nutrients. The amount of SOM in each soil types in Aol are estimated using the guideline for ecological economic damage assessment (MEGD, 2014b) based on laboratory analysis results. As shown in Table 6-12, the amount of soil organic matter changes according to soil types, local hydro-climate condition and their nature formation in Aol. The soil types in Aol have high amount of soil organic matter such as mountain soils and alluvial derno soil have high amount of soil organic matter due to soil re-distribution processes.

Table 6-12 Soil organic matter in Aol

Soil Types	Current SOM in Aol (tn/hector)
Mountain kashtanozem	138
Mountain chestnut soil	50
Chestnut soil	111
Meadowish soil	93
Alluvial derno soil	105
Alluvial -gravel soil	46

#### 6.1.7.5 Soil Contamination

The following four topsoil samples were collected from the indicated locations within the Aol:

- T-2 – Songinokhairkhan Mountain near the proposed AWPP site
- T-8 – degraded area in the Tuul River Valley along raw water pipeline
- T-11 – degraded area at proposed Shuvuun wellfield site, near mining operation
- T-13 – disturbed area at proposed Biokombinat wellfield site

The soil samples were sealed in plastic bags and sent to the laboratory of Engineering Geodesy LLC for heavy metal analysis. The laboratory used a standard reference analysis for total



concentration of the following heavy metals, determined by inductively coupled plasma mass spectrometry using acetylene flame:

- arsenic (As)
- barium (Ba)
- calcium (Ca)
- cadmium (Cd)
- chromium (Cr)
- copper (Cu)
- iron (Fe)
- magnesium (Mg)
- nickel (Ni)
- lead (Pb)
- zinc (Zn)

The laboratory analysis by inductively coupled plasma mass spectrometry indicated Cu as having the lowest concentrations, with all values being no detect or 0.001 milligrams per kilogram at all sample locations. Among the seven heavy metals for which a maximum allowable concentration is specified at MNS 5850:2019, the maximum allowable concentration was exceeded for four metals (lead, arsenic, nickel, and zinc), as well as exceeded nominally for cadmium, by the concentrations for samples from one or more sample locations. The maximum allowable concentrations for cadmium and chromium were not exceeded.

Among the four topsoil samples, T-11 from the proposed Shuvuun wellfield site and T-8 along raw water pipeline presented the highest concentrations of heavy metals and the most extensive exceedances of the MNS 5850:2019 maximum allowable concentrations. The sample T-8 lead and zinc concentrations were 1.9 and 4.1 times higher than the maximum allowable, respectively; and the sample T-11 arsenic and nickel concentrations were 13.9 and 3.4 times higher than the maximum allowable concentrations, respectively. The arsenic and nickel concentrations for samples T-2 (AWPP) and T-13 (Biokombinat wellfield) also exceeded the respective maximum allowable concentrations, although the heavy metal concentrations for those two samples were substantially lower than the concentrations for samples T-8 and T-11. The soil conditions of the AoI have been significantly affected or degraded, mainly due to anthropogenic activities such as intensive urbanization, livestock grazing at proposed Shuvuun wellfield and gravel mining activities at Shuvuun wellfield. However, it is difficult to conclude what is the normal heavy metal concentration in this AoI since there are no comprehensive soil research studies for this region.

**Table 6-13 Comparison of Heavy Metal Concentration and Maximum Allowable Soil Pollutant Concentrations (MNS 5850:2019)**

Heavy metal	MNS 5820:2019 mg/kg	T-2 mg/kg	T-8 mg/kg	T-11 mg/kg	T-13 mg/kg
<b>Pb</b>	100	37	192	144	25.5
<b>Cd</b>	3	0	2.97	3.01	0
<b>Hg</b>	2	-	-	-	-
<b>As</b>	20	92.5	182.5	298.5	91
<b>Cr</b>	150	22.5	79.01	16.5	0
<b>Cu</b>	100	0	0	0	0
<b>Ni</b>	150	233	410.86	657.83	206.41
<b>Co</b>	50	-	-	-	-
<b>Zn</b>	300	147	1525.5	1012	16.5
<b>Mg</b>	-	36.5	45.6	40.9	51.6
<b>Fe</b>	-	231.6	227.6	721	144
<b>Ca</b>	-	41.7	67.5	70.9	78.4
<b>Ba</b>	-	142	105.4	388	5.5

**Notes:** mg/kg indicates milligrams per kilogram; Hg indicates mercury; Co indicates cobalt.

Samples were not analyzed for Hg or Co due to laboratory capacity. Only limiting values are shown in the table according to MNS 5850:2019. Later, in the calculations Hg, Co values are taken from the literature Batkhishig et al. (2016)

### 6.1.7.6 Current Soil Pollution and Risk Issues

Pollution load index were evaluated to prove the deterioration of the soil conditions as a result of the accumulation of heavy metals by anthropogenic sources (Memet, 2017). In other hand, this index provides which the soil associated which heavy metal which might impact the micro flora and fauna of soils. The pollution load index is calculated as following equation:

$$CF = \frac{HM \text{ concentration}}{\text{Background HM concentration}}$$

$$PLI = \sqrt[n]{(CF1 * CF2 * CF3 * ... * CFn)}$$

Where, PLI- *Pollution Load index*, CF- *contamination factor*, n- *number of heavy metals*, HM concentration- *heavy metal concentration in Aol*, Background HM concentration- *Background heavy metal concentration in study area*.  $PLI > 1$  indicates pollution and demonstrates dynamic deterioration of the quality, whereas  $PLI = 0$  (background concentration);  $0 < PLI \leq 1$  (Unpolluted);  $1 < PLI \leq 2$  (low);  $2 < PLI \leq 3$  (Moderate);  $3 < PLI \leq 4$  (high) (Kowalska et al., 2018 and Jorfi et al., 2017).  $PLI \leq 0$  is negative impact on soil biota.

The calculated pollution load index values are shown in Table 6-14 and Figure 6-44, which ranged from 0.01 in mountain kashtanozem and mountain chestnut and chestnut and alluvial derno soil, 2.09 in alluvial gravelly soil and 3.99 in meadowish soil, respectively. The results are confirmed that the meadowish soils in Biokombinat wellfield area and alluvial gravelly in Shuvuun wellfield area were more contaminated than other areas due to CWWTP outfall and mining activities.

**Table 6-14 Pollution Load index in Aol**

Soil Types	Pollution Load Index	Soil Types	Pollution Load Index
Mountain kashtanozem	0.01	Meadowish soil	3.99
Mountain chestnut soil	0.01	Alluvial derno soil	0.01
Chestnut soil	0.01	Alluvial -gravel soil	2.09

Addition to above assessment, ecological risk is conducted due to soil contamination issues in Aol. Ecological risk index is intended to evaluate the likelihood of adverse ecological effects due to the occurrence of heavy metal contamination (Gong et al., 2008). The following equation was used for calculation:

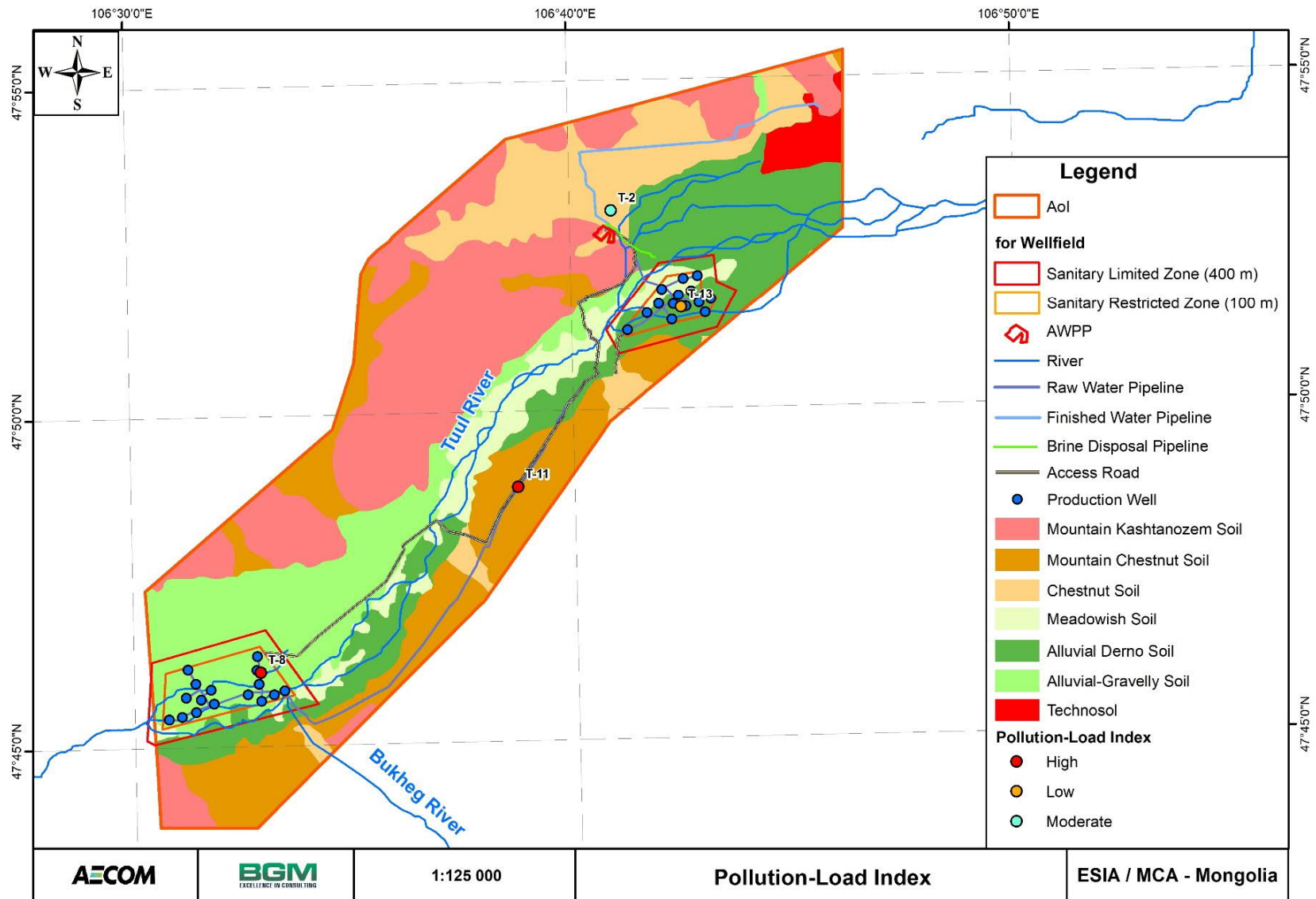
$$Er = Ti * CF$$

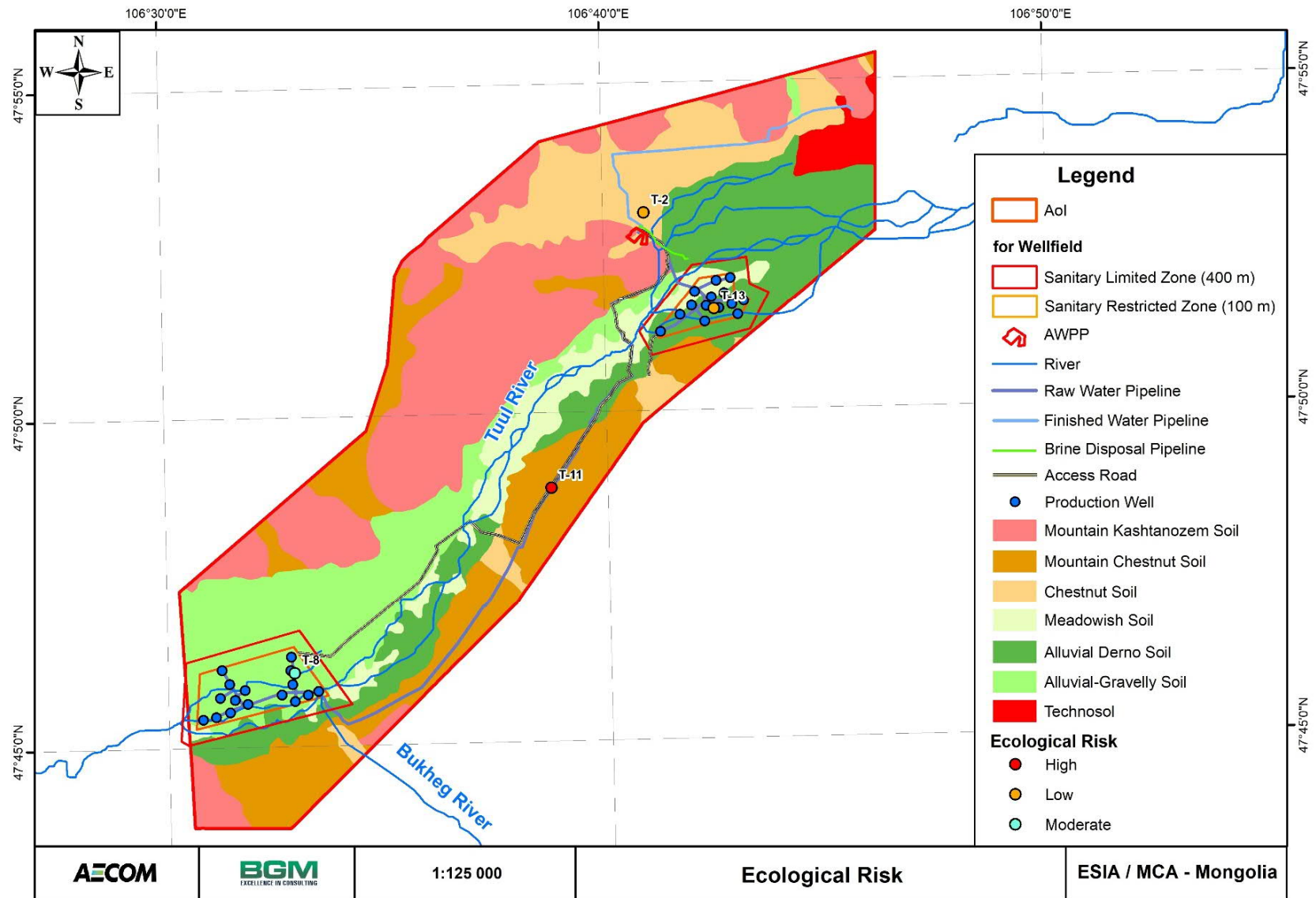
Where, Er is ecological risk index and Ti is the toxic-response factor for a given substance, and CF is the contamination factor. The Ti values of heavy metals by Hakanson are given (Pb, Ni, Cu=5, Zn=1, Cd=30, Cr=2, As=10) to describe the ecological risk factors. The ecological risk index was determined:  $Er < 40$ , low;  $40 \leq Er < 80$ , moderate;  $80 \leq Er < 160$ , high (Mugosa et al., 2016).

**Table 6-15 The ecological factor in Aol**

Soil Types	Ecological risk	Soil Types	Ecological risk
Mountain kashtanozem	17	Meadowish soil	64
Mountain chestnut soil	17	Alluvial derno soil	57
Chestnut soil	17	Alluvial gravelly soil	14

The ecological risk of Aol is shown the Table 6-15, higher ecological risk occurred in meadowish soil in Biokombinat wellfield area and moderate in alluvial-gravelly soil in Shuvuun wellfield area in Aol.

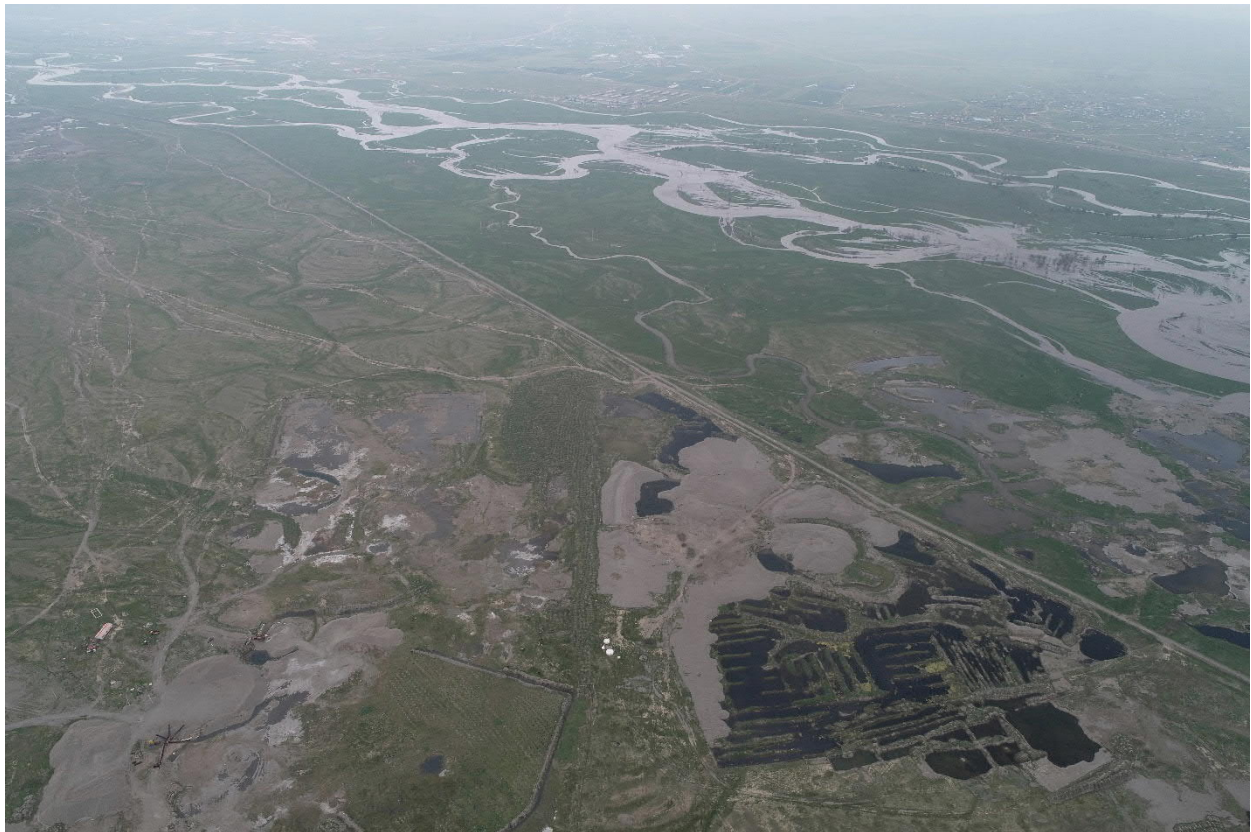






### 6.1.7.7 Soil Disturbance in Shuvuun Wellfield

Along the Tuul River's northern floodplain in Shuvuun area, the land or soil has been damaged due to many gravel mining quarries, which alter the landscape by digging large open-pits, creating artificial ponds, and lowering the groundwater levels (see Figure 6-46 and Figure 6-47). All of excavated area of gravel mining are located at alluvial gravelly soil in Shuvuun areas. In addition to this, the open-pits and roads created by heavy vehicles results in increased weathering of soil and causes dust.



**Figure 6-46 Disturbed Land by Gravel Mining Activities in Shuvuun Area (August 2019: Drone footage)**

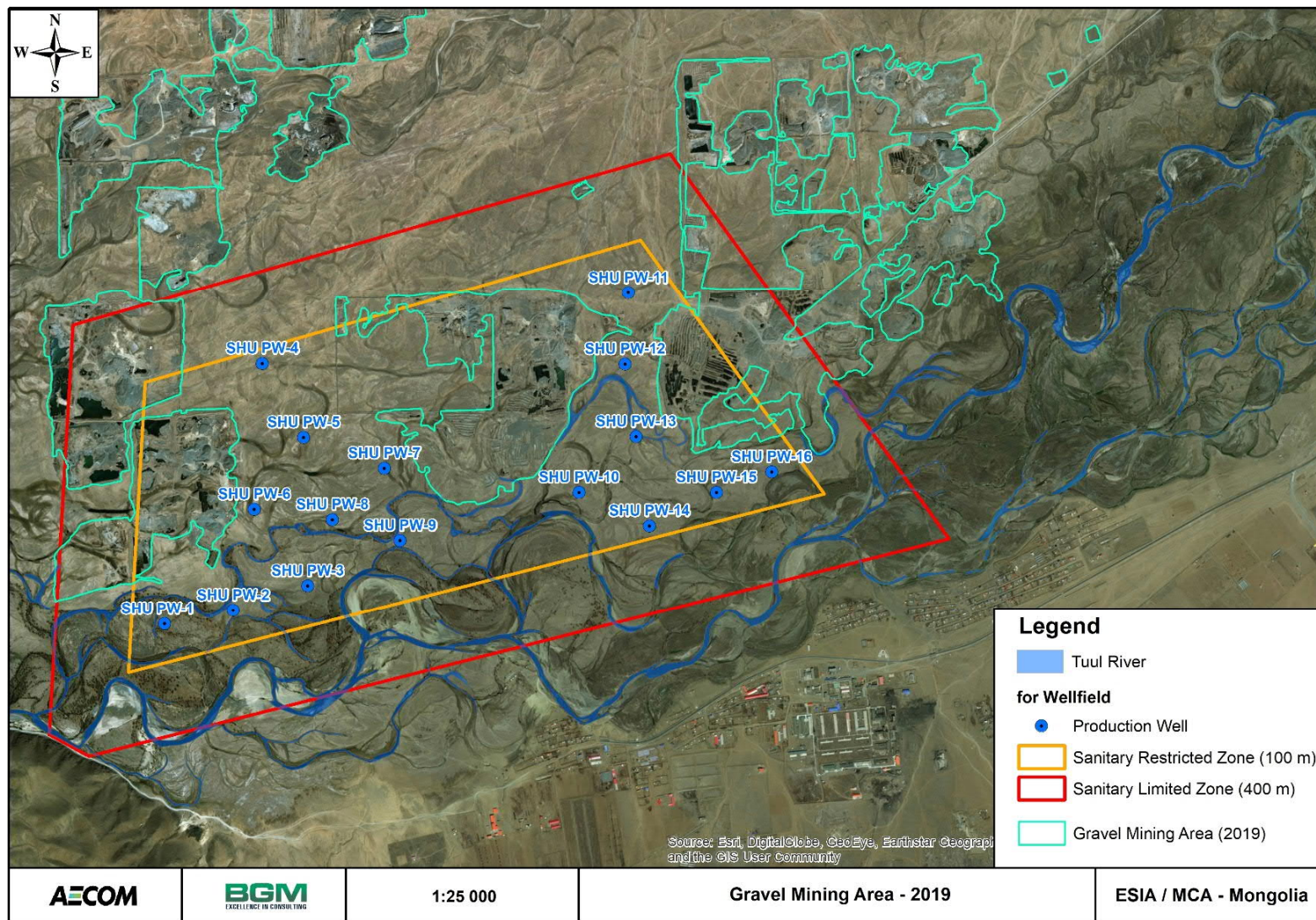
The amount of disturbed land or soil due to gravel mining activities in entire Shuvuun area is calculated from 2009 to 2019 as shown in Figure 6-48. Additionally, the amount of disturbed land or soil in hygiene restricted zone of Shuvuun wellfield area is also determined between 2009 and 2019 as shown in Figure 6-49.

The volume of excavated area due to gravel mining activities in hygiene restricted zone of Shuvuun wellfield area is estimated based on UAV measurement by the drone (see Figure 6-50). The estimated lost volumes are 585.082.2 m<sup>3</sup> and covered 288 hectares (as of August, 2019) in sanitary restricted zone of Shuvuun wellfield area.

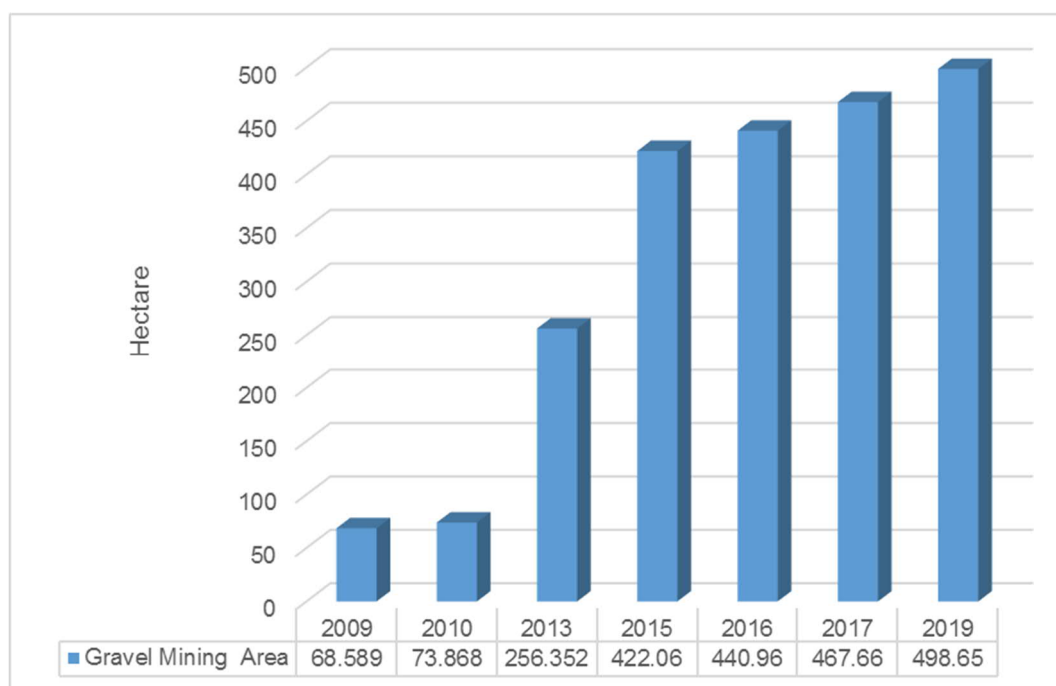
The quarries have been banned and no further impact should be occurring due to recent legislation. However, gravel mining activities are still on-going in the proposed sanitary restricted zone of Shuvuun wellfield area. The miners are primarily responsible for restoration of these disturbed land. In addition to this the MCA-Mongolia is coordinating with various government agencies and departments to initiate restoration process. Also a working group was established under MCUD to manage the restoration of gravel mining area before the construction activities begin. These disturbed land or soil in sanitary restricted zone of Shuvuun wellfield area need to be restored prior to construction phase of BWSE project since these disturbed areas will

be potential contamination sources for the groundwater resource due to exposed groundwater. With this potential risk, the AWPP is designed for handling any contamination problem.

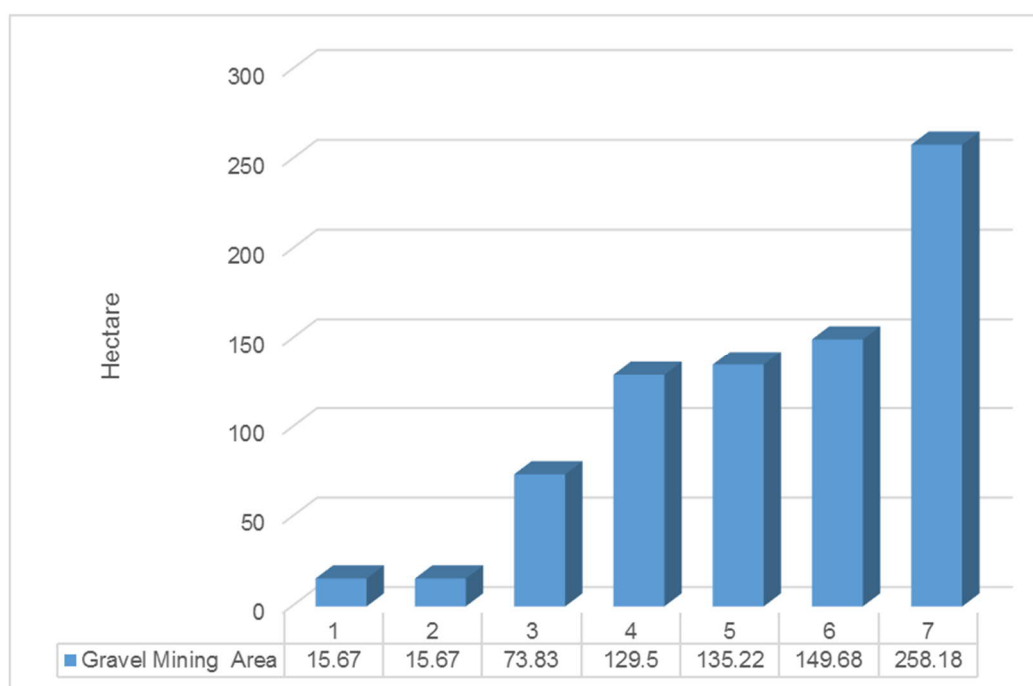




**Figure 6-47 Disturbed Land by Gravel Mining Activities (Shuvuun wellfield, 2019)**



**Figure 6-48 Disturbed Land by Gravel Mining Activities in Shuvuun Area (2009-2019)**



**Figure 6-49 Disturbed Land by Gravel Mining Activities in Sanitary Restricted Zone of Shuvuun Wellfield (2009-2019)**





**Figure 6-50 Disturbed Land by Gravel Mining Activities, Shuvuun Wellfield (Drone image)**



## 6.1.8 Water Resources

Drinking water supplies in UB city are completely dependent on groundwater sourced from pumped wells located in the alluvial plain of the Tuul River, which flows through the city (see Figure 6-51). UB relies exclusively on water from groundwater aquifers for its water supply (2030 Water Resources Group, 2016).

UB city is located in the Tuul River Valley. The Selbe, Belkh, Uliastai, Gachuurt, Hul, Tolgoit, and Turgen Buhug rivers flow from the northern, western, and eastern sides of the city into the Tuul River. Of these, the largest surface water stream is the Tuul River. The river's flow varies depending on season and location.

The main source of the Tuul River flow is rainfall during the summer and autumn, and the water level during warmer seasons is higher than during the cooler months. Although spring flooding occurs at the end of April and at the beginning of May, its duration and volume are variable.

Groundwater and seasonal snowmelt account for only a small percent of the annual flow of the Tuul River. The average flow of Tuul River near UB city is 23.8 cubic meters per second and the river flow is about 6 percent from snowmelt, 69 percent from rainfall, and 25 percent from groundwater (Byambakhuu et al., 2016). The interaction between surface water and groundwater resources within the Tuul River watershed has been well documented (see Section 6.1.8.4).

The watershed area of sub-basins in the upper Tuul River basin are delineated using ArcSWAT modeling tool as shown in Figure 6-52. The outlet is fixed at the Tuul-Altan-Bulag hydro-station. The watershed areas of each sub-basin are shown in Table 6-16.

**Table 6-16 Watershed areas in Upper Tuul River Basin**

Sub-basin	Watershed area, hectare	Soil Types	Watershed area, hectare
<b>Sub-basin 1</b>	269.443	Sub-basin 4	105.280
<b>Sub-basin 2</b>	130.857	Sub-basin 5	134.374
<b>Sub-basin 3</b>	227.303	Sub-basin 6	59.117

The BWSE project would be implemented across sub-basins 4, 5 and 6 as shown in Figure 6-52. Thus, the overall Aol with 17,898 hectares would be covered hydrological and hydrogeological processes studied during ESIA development.

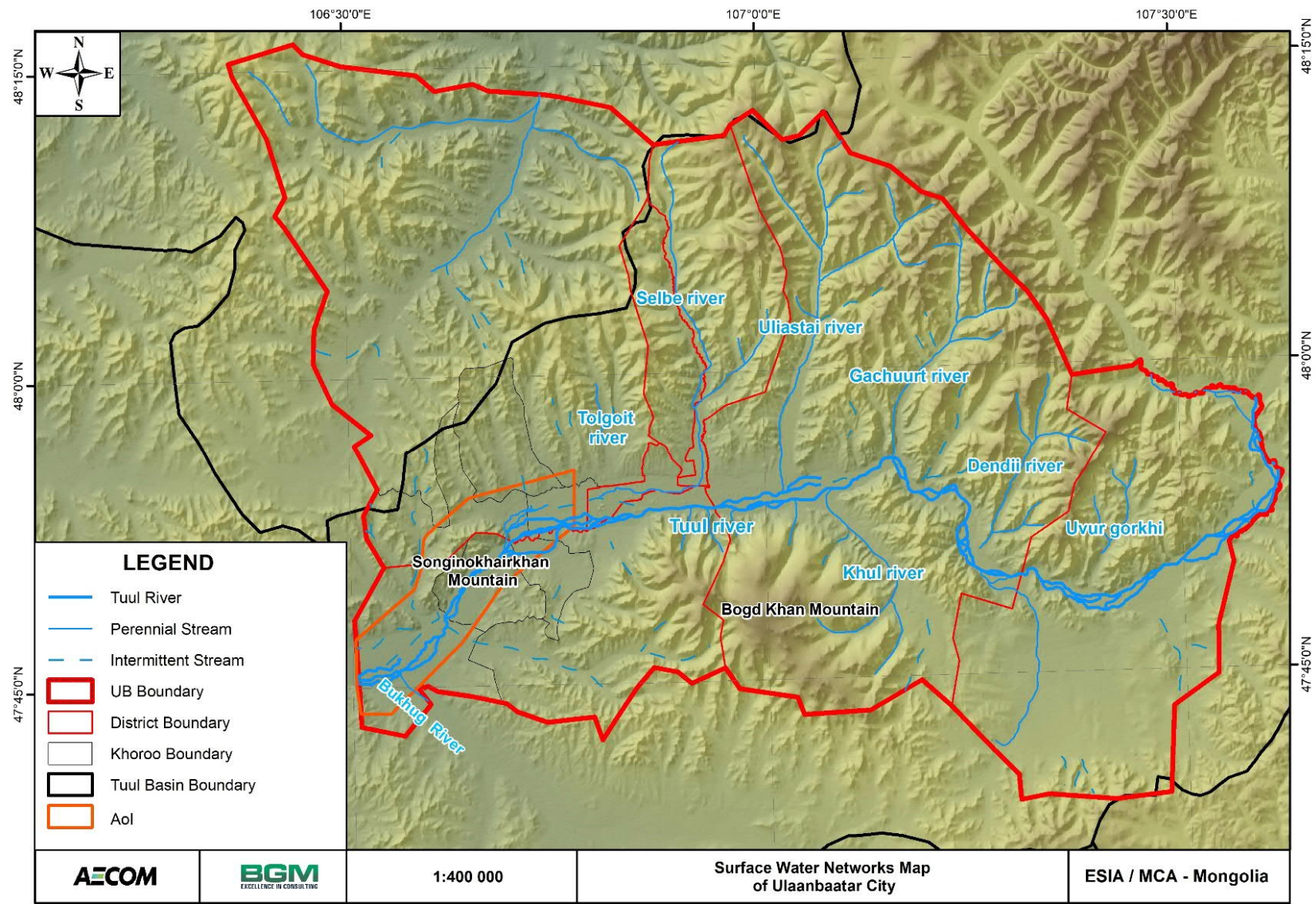


Figure 6-51 Surface Water Networks

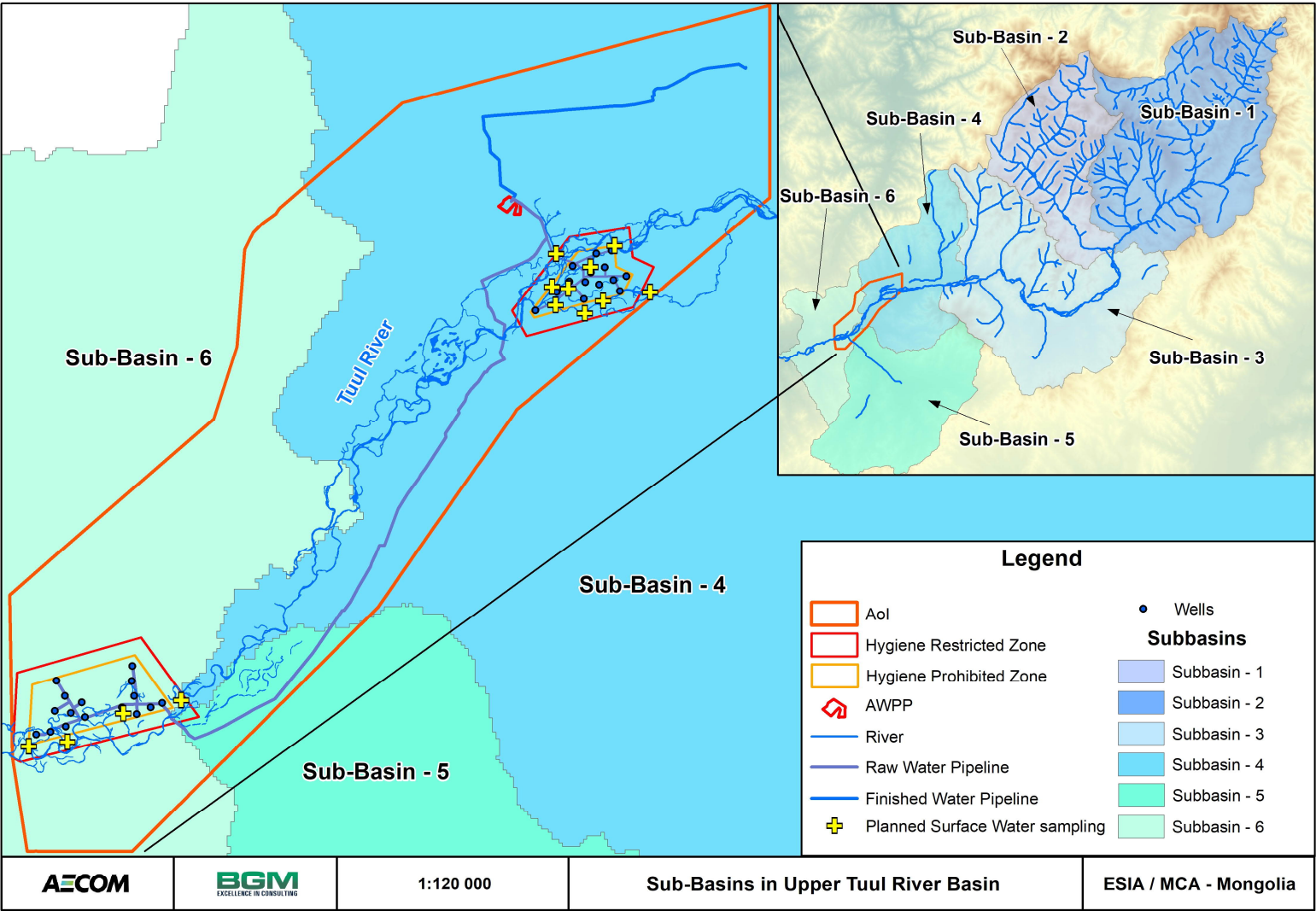


Figure 6-52 Sub-Basins in Upper Tuul River Basin.



### 6.1.8.1 Surface Water

The Tuul River is approximately 700 kilometers long, with a catchment of approximately 49,840 square kilometers. The Tuul River Basin covers only 3.2 percent of Mongolia's territory (MEGD, 2012). The Tuul has eight major tributaries—i.e., the Galtai, Khag, Khongor, Zuunbayan, Kholiin, Uliastai, Selbe, and Kharbukh rivers—and drains into the Orkhon River. In turn, the Orkhon is one of the main tributaries of the Selenge River, which is the main artery of Lake Baikal.

Flows in the Tuul River are variable; seasonally as well as from year to year. Seasonally, river flows are characterized by periods of no flow or near-zero flow—less than 100,000 cubic meters per day or 1.16 cubic meters per second—in the winter, typically from mid-December to April, and relatively high flows in the summer wet season. This regime is illustrated by flow measurements for several years at the UB gauge (see Figure 6-53). Generally, the period of relatively high river flows corresponds to the period of relatively high precipitation from April through September, when more than 90 percent of the annual rainfall in UB occurs (Institute of Meteorology and Hydrology, 2017). In 2014, flows greater than 1.16 cubic meters per second commenced on April 10 and ended on December 5; in 2015, the corresponding dates were March 26 and November 24, respectively.

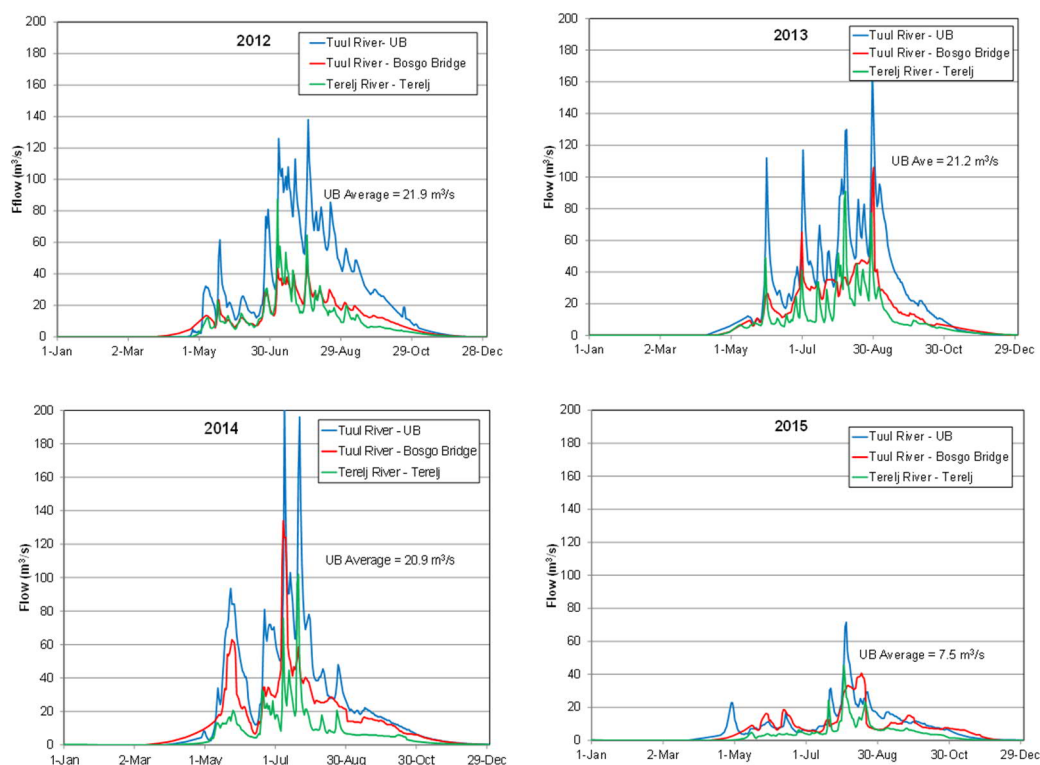


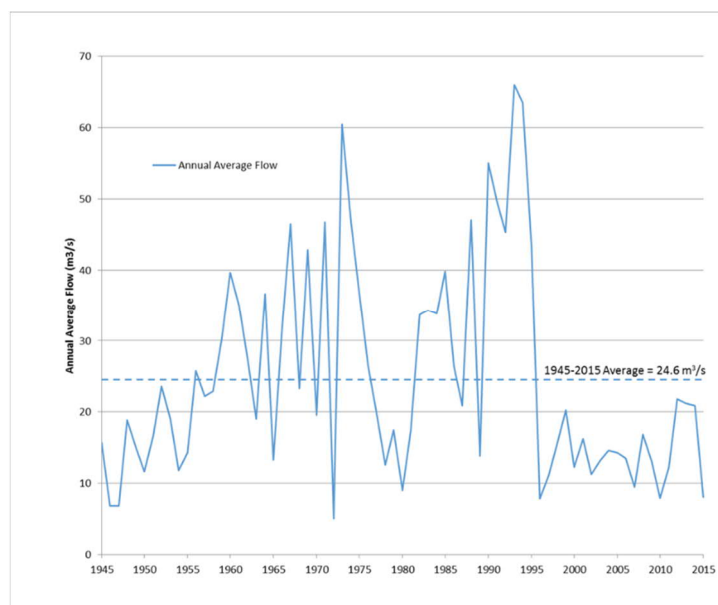
Figure 6-53 Typical Seasonal Variability within the Tuul River

The plots shown in Figure 6-53 also include flow records for the Bosgo Bridge and Terelj flow gauges upstream of UB city. The Bosgo Bridge gauge is located on the Tuul River upstream of the Terelj River confluence. The Terelj gauge is located on the Terelj River. Both gauges are upstream of any significant groundwater abstraction and both gauges exhibit significant periods with zero flow; in fact, about as long as those at the UB gauge. This observation contradicts the view that the zero flow and full depth freezing of the Tuul River is due to the groundwater abstraction at the wellfields (Enkhbayar, 2017).

The no-flow periods occur in the winter when aquifer recharge is essentially zero, because of the low precipitation and low temperatures such that the ground is frozen and precipitation is

in the form of snow. Because of the lack of recharge, groundwater levels drop and discharge to streams ceases. And, because of the low temperatures, the little groundwater discharging to the river freezes. During intermediate periods, only the surface is frozen and flow still occurs underneath. However, because the river depths are small, the river soon freezes from top to bottom.

Annual average flows from 1945 to 2015 are plotted in Figure 6-54, showing year to year variations. For several years during the period of record, the annual average flows dropped to very low levels—notably to below 10 cubic meters per second in 1946, 1947, 1972, 1980, 1996, 2007, 2010, and most recently in 2015.



**Figure 6-54 Annual Average Flows at UB Gauge, 1945-2015**

Figure 6-55 shows the annual flows—i.e., the total daily flows by year—from 1985 to 2015. The figure depicts the total daily flows below the long-term average of 24.6 cubic meters per second and, stacked thereon, the daily flows above the long-term average. Although annual flows have been highly variable since 1985, that variability has not been due to changes in flows below the long-term average. Daily flows below 24.6 cubic meters per second generally have remained consistent since 1985, although they have trended upward slightly. The variability is predominantly attributable to changes in the flows above the long-term average, which have trended downward, with a sharp drop from 23,173 cubic meters per second in 1994 to 2,865 cubic meters per second in 1996. This drop has been attributed to combination of increased groundwater abstraction and climate change impacts (Byambakhuu et al., 2016; Dorjsuren et al, 2015a)



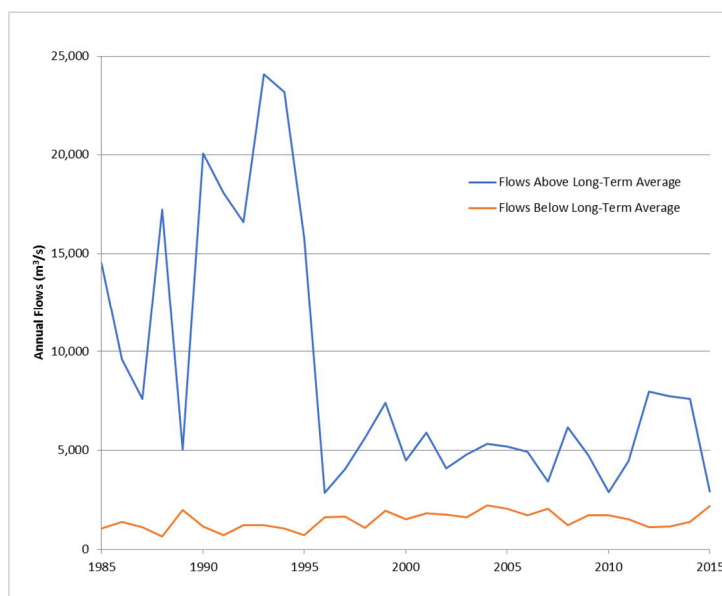


Figure 6-55: Annual Flows at UB Gauge, 1985-2015

### 6.1.8.2 River Freezing

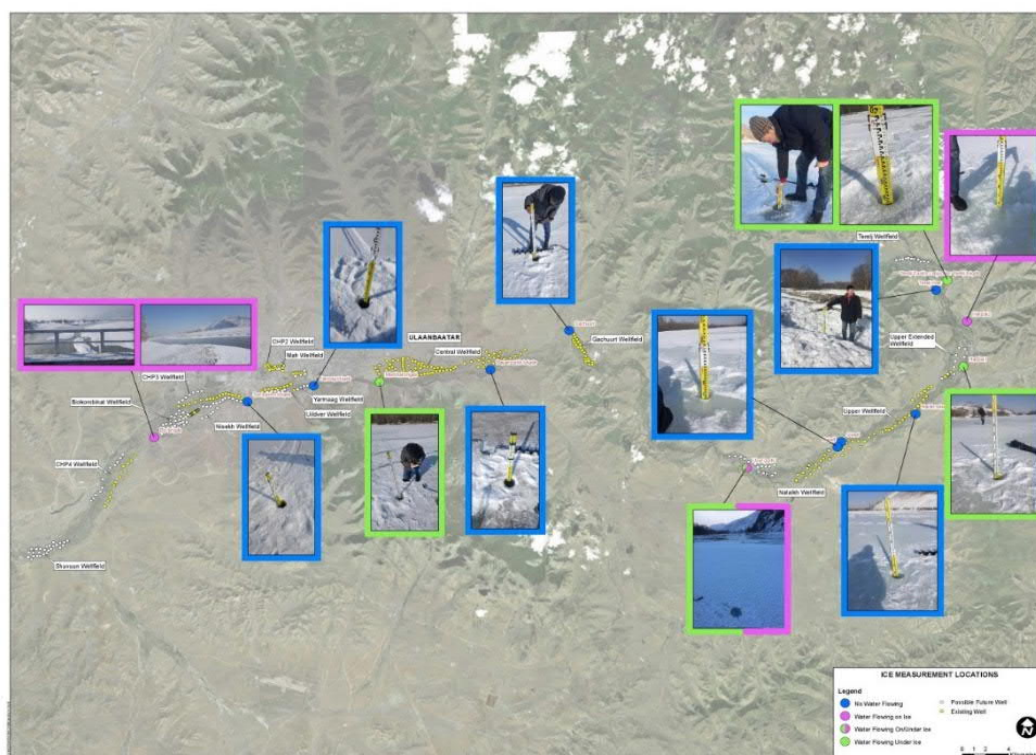
Records of Tuul River ice thickness at the UB gauge show that ice starts to form at the beginning of November, with an average ice thickness of 18 centimeters by November 20 (assuming zero when there is no record). Flow records at the UB gauge show that low flows persist until early to mid-January. Therefore, flows occur under ice for extended periods of time. It is assumed that records of zero flow indicate completely frozen conditions. This assumption is reasonable as flow records gradually dwindle toward zero prior to the time when zero flows are reported, and this occurrence was confirmed verbally by several locals (AECOM, 2018b).

In the spring, the ice thickness records show considerable ice, ranging in thickness from 34 to 78 centimeters, on April 10. After that date the records include many blanks and those may indicate no ice or just that the ice thickness was not measured. The flow records show that flows in the river gradually start around April 1. Therefore, the early flows in the spring occur when ice is still present.

Thus, in summary, the flow and ice thickness records indicate that:

- Flows persist in the river under the ice for at least two months (November, December, and into January)
- Eventually portions of the river freeze over its full depth and flow under the ice ceases
- In the spring, flows start at a time when ice is still present

In February 2018, the local experts of AECOM conducted an evaluation of ice thickness and an assessment of flowing, or non-flowing, river conditions spanning 15 locations along the Tuul River from the Terelj River (upstream) to the Biokombinat Bridge (downstream). The evaluation revealed variability along the river, with no clear pattern with respect to the presence/absence of flowing water. In Figure 6-56, blue dots represent locations with no water flowing (all ice); pink dots represent locations with water flowing (somewhat surprisingly) on top of ice; green dots represent locations with water flowing under ice; and bi-color dots indicate water flowing both on top of and below the ice.



**Figure 6-56 Ice Thickness Survey Along Tuul River**

### 6.1.8.3 Groundwater

In general, the Tuul River alluvial aquifer is contained in the Tuul River Valley, overlying bedrock of various types (Dorjsuren et al., 2015). The Tuul River aquifer has been the subject of a number of investigations in the past, mainly to assess its water supply potential (PNIIS, 1985; Dorjsuren et al., 2015). The aquifer has a width of 1 to 3 kilometers and depths of 15 to 100 meters. The aquifer is composed of sand and gravel with lenses of silt and clay. In some areas two layers can be distinguished composed of coarse-grained alluvium overlying finer-grained alluvium consisting of fine sand with silt and clay lenses (PNIIS, 1985).

Comprehensive hydrogeological field investigations at the proposed Biokombinat and Shuvuun wellfield sites were undertaken during the summer and autumn season of 2019 (see Figure 6-57 and Figure 6-58).

For the Shuvuun wellfield (see Table 6-17):

- The hydraulic conductivity of the aquifer ranged between 26 and 238 meters per day
- Aquifer thickness ranged between 35.4 to 55.6 meters

For the Biokombinat wellfield (see Table 6-18):

- The hydraulic conductivity of the aquifer varied between 42 and 105 meters per day
- Aquifer thickness varied between 49.7 to 59.8 meters

A specific yield of 0.2 was chosen uniformly for the Biokombinat wellfield and 0.15 was chosen uniformly for the Shuvuun wellfield. These values were also used for the water resource evaluation.

**Table 6-17 Hydrogeological Parameters for Shuvuun Wellfield**

№	Well ID	Hydraulic conductivity K м/day.	Aquifer thickness H, м
1	SHU-TPW-1	79	54.15
2	SHU-TPW-2	42	54.71
3	SHU-TPW-3	93	55.96
4	SHU-TPW-4	81	55.46
5	SHU-TPW-5	105	59.81
6	SHU-TPW-6	86	55.44
7	SHU-EBW-1	64	53.75
8	SHU-EBW-2	44	55.54
9	SHU-EBW-3	96	55.94
10	SHU-EBW-4	74	53.14
11	SHU-EBW-5	63	49.95
12	SHU-EBW-6	56	51.52
13	SHU-EBW-7	50	57.24
14	SHU-EBW-8	55	51.87
15	SHU-EBW-9	82	57.44
16	SHU-EBW-10	64	49.7
<b>Average</b>		70	54.48
<b>Max</b>		105	59.81
<b>Min</b>		42	49.7

**Table 6-18 Hydrogeological Parameters for Biokombinat Wellfield**

№	Well ID	Hydraulic conductivity K м/day.	Aquifer thickness, H м
1	BIO-TPW-1	87.7	54.72
2	BIO-TPW-2	75.2	50.26
3	BIO-TPW-3	238.7	36.2
4	BIO-TPW-4	103.9	48.87
5	BIO-TPW-5	52.5	47.4
6	BIO-TPW-6	63.5	55.62
7	BIO-EBW-1	141.2	42.83
8	BIO-EBW-2	25.9	52.14
9	BIO-EBW-3	98.7	49.6
10	BIO-EBW-4	114.5	35.4
11	BIO-EBW-5	72.1	53.04
12	BIO-EBW-6	111.1	41.61
13	BIO-EBW-7	53.6	43.98
14	BIO-EBW-8	67.2	42.6
<b>Average</b>		93.3	46.73
<b>Max</b>		238.7	55.62
<b>Min</b>		25.9	35.4



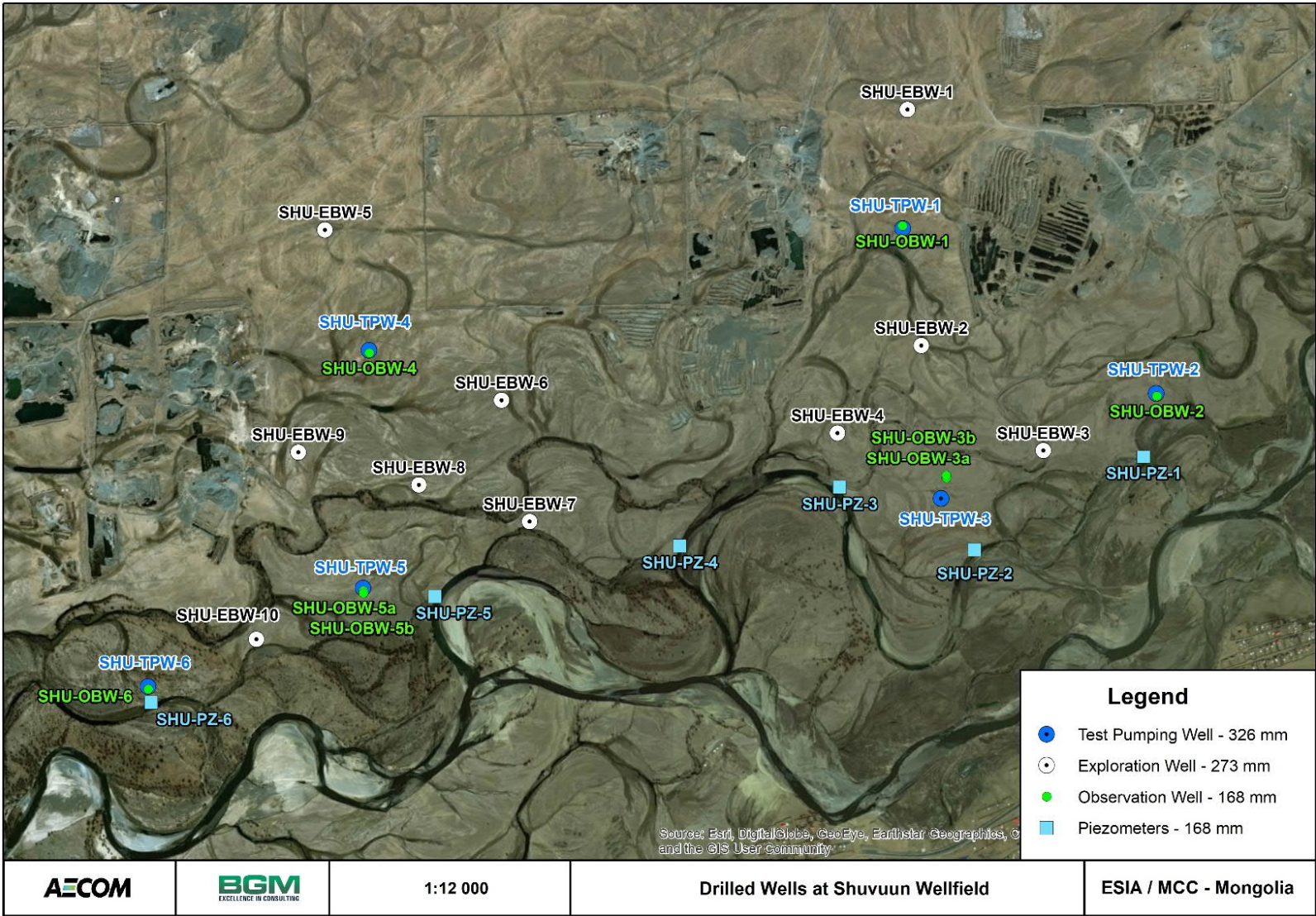


Figure 6-57 Drilled Wells at Shuvuun Wellfield



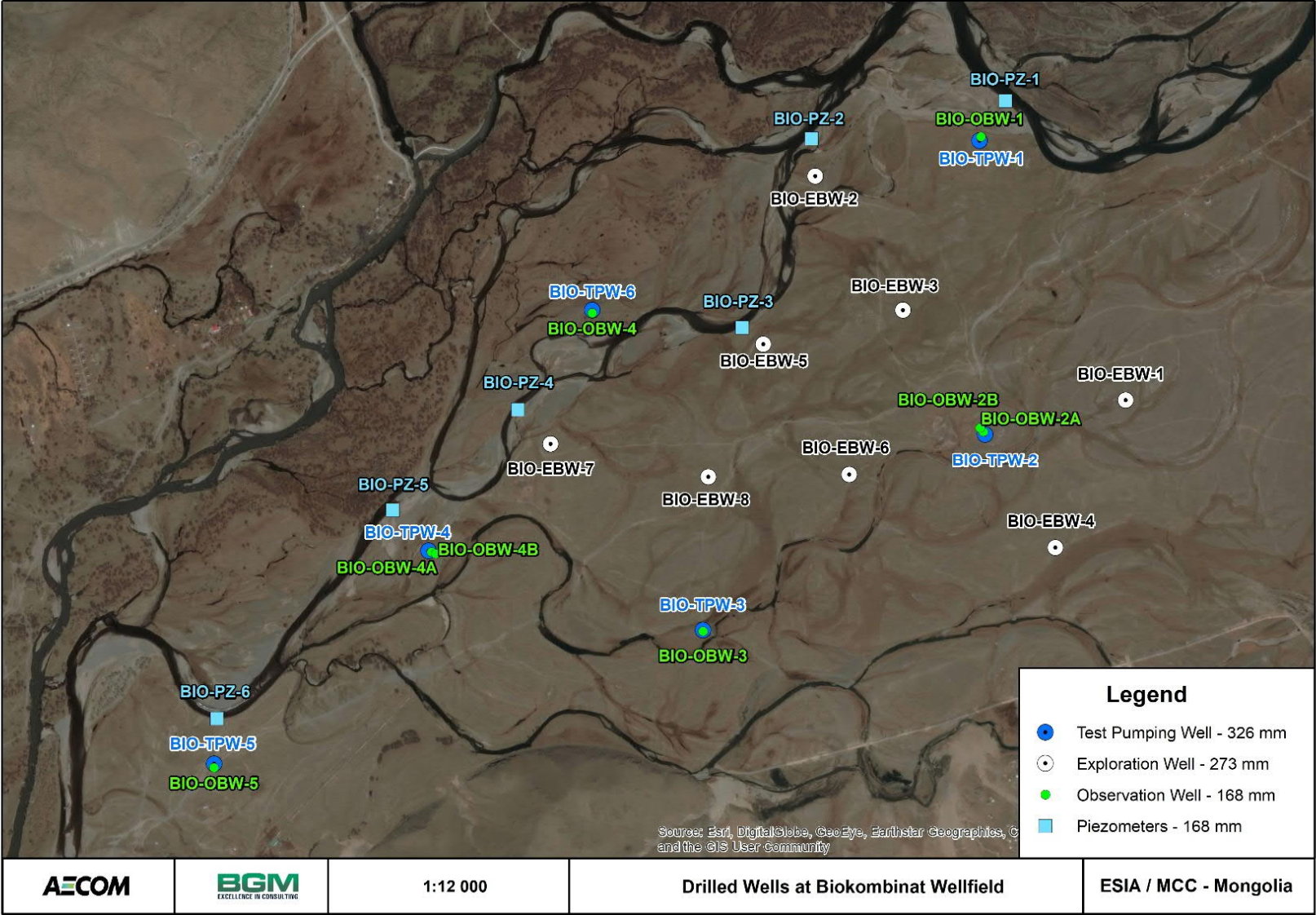


Figure 6-58 Drilled Wells at Biokombinat Wellfield



#### **6.1.8.4 Interaction between the Tuul River and the Aquifer**

In general, because of the high hydraulic conductivity in the soils underlying the streams in the Upper Tuul River Basin, and in particular in the area tapped for UB city water supply, considerable interaction between the streams and the aquifer exists. When groundwater levels are high, groundwater discharges to the streams. When groundwater levels are low, stream seepage recharges groundwater, provided the streams have water in them and are not frozen. These conditions alternate seasonally with some geographic variability.

During the winter, because of the lack of rainfall and the frozen nature of the surficial soils, aquifer recharge essentially ceases and groundwater levels decline to the point where groundwater discharge to streams ceases. As a result, and because of the lack of overland runoff, flow in the streams diminishes to zero. During this period, groundwater discharge to the streams is also hampered by the streams being frozen, which prohibits inflow from the ground. During intermediate periods, when the streams are not frozen over their entire depths, limited groundwater discharge still occurs, feeding an underflow below the ice cover.

During the spring, as soils and streams unfreeze and rainfall increases, aquifer recharge resumes and groundwater levels rise. In the upstream areas, where aquifer thicknesses are small, groundwater discharge to the streams resumes. As a result, and in combination with overland runoff into the streams, stream flows resume. During the summer, as rainfall increases, groundwater levels continue to rise and groundwater discharge to the streams becomes more generalized (rather than occurring mainly in upstream areas).

This cycle occurs naturally but is enhanced by groundwater withdrawals in the wellfield areas; therefore, groundwater levels can decline considerably during the winter due to the withdrawals. However, aquifer replenishment is rapid in the spring and early summer due to seepage from the streams.

During the hydrogeological field investigation at the proposed Shuvuun and Biokombinat wellfield sites, the interaction of surface water and groundwater was investigated. For this study, six 168-millimeter-diameter by 6.0-meter-deep piezometers were installed along the riverbank at each wellfield by air-hammering methods. The piezometers were placed 2.3 to 5.9 meters away from the river's edge. Using the air-hammer method, the screen was set in natural formation materials, without a gravel pack. In combination with surface water staff gauges, the piezometers made it possible to gather surface and groundwater level data at the same time.

A companion surface water staff gauge was installed close to each piezometer to enable recording simultaneous surface water and groundwater levels at multiple locations. The staff gauge locations were chosen to monitor water level changes during pumping tests, especially for those test pumping wells installed close to the Tuul River. Water levels in each surface water staff gauge/piezometer pair were measured twice a day.

Surface and groundwater levels were monitored for a period of 40 days (August 4 to September 23, 2019) at the proposed Shuvuun wellfield and 18 days (July 7 to 25, 2019) at the proposed Biokombinat wellfield. Due to the heavy rains at the end of July, however, the flow in the Tuul River increased sharply, causing it to flood the Biokombinat wellfield site, which prevented further measurement. Therefore, the results for Biokombinat wellfield provide only a short-term record.

For the Shuvuun wellfield site, the rainy days in early August caused the water level in the river and aquifer to rise 35 to 40 centimeters. The water level declined significantly after August

15, before returning to its original water level on August 18. The levels in the river and the aquifer continued to decline slowly due to generally dry weather and, by September 18 to 19, the river level had declined as much as 40 to 45 centimeters in certain locations (see Figure 6-59<sup>39</sup>).

As for the Biokombinat wellfield site, from July 7 to 16, the Tuul River surface water level and the groundwater levels decreased 10 to 13 centimeters. By July 24, due to many rainy days, the river level increased 20 to 24 centimeters before the river started flooding. The rainy days of July 24, 25, and 26 caused a temporary suspension of the measurements. Nonetheless, groundwater levels near the riverbank and corresponding surface water levels fluctuated at the same rate (see Figure 6-60<sup>40</sup>).

The pattern that emerged during the measurements was that the surface water level fluctuations were within a much bigger range, while the groundwater level fluctuations were within a smaller range, although the groundwater level change lagged behind the surface water level change. This pattern shows that when there is flooding with high rates of water flow, there is high infiltration to the riverbank even though the resulting changes in groundwater levels lag behind in time. Looking at the results, the outwash along the Tuul River Basin has a direct hydraulic relationship with the surface water; seasonal conditions and precipitation events cause fluctuations in both surface water and groundwater.

The amount of water being infiltrated from the Tuul River under high surface water flow rates, in response to the precipitation in warm months, to the riverbank is high and varies over time, depending on the lithology of the riverbank and the hydraulic conductivity. Two water loggers per wellfield site, four in total, were installed in select wells to measure the Tuul River's water level change and fluctuation due to precipitation, groundwater reserve, and distant recharge to the groundwater as these factors relate to the proposed wellfields. To gauge surface water levels, three Onset HOB0 model automated loggers were installed. The results of this investigation are shown in Figure 6-61.

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<sup>39</sup> SHU-PZ-1 through SHU-PZ-6 indicate the piezometer (groundwater measurement) locations and SHU-SG-1 through SHU-SG-6 indicate the staff gauge (surface water measurement) locations.

<sup>40</sup> BIO-PZ-1 through BIO-PZ-6 indicate the piezometer (groundwater measurement) locations and BIO-SG-1 through BIO-SG-6 indicate the staff gauge (surface water measurement) locations.

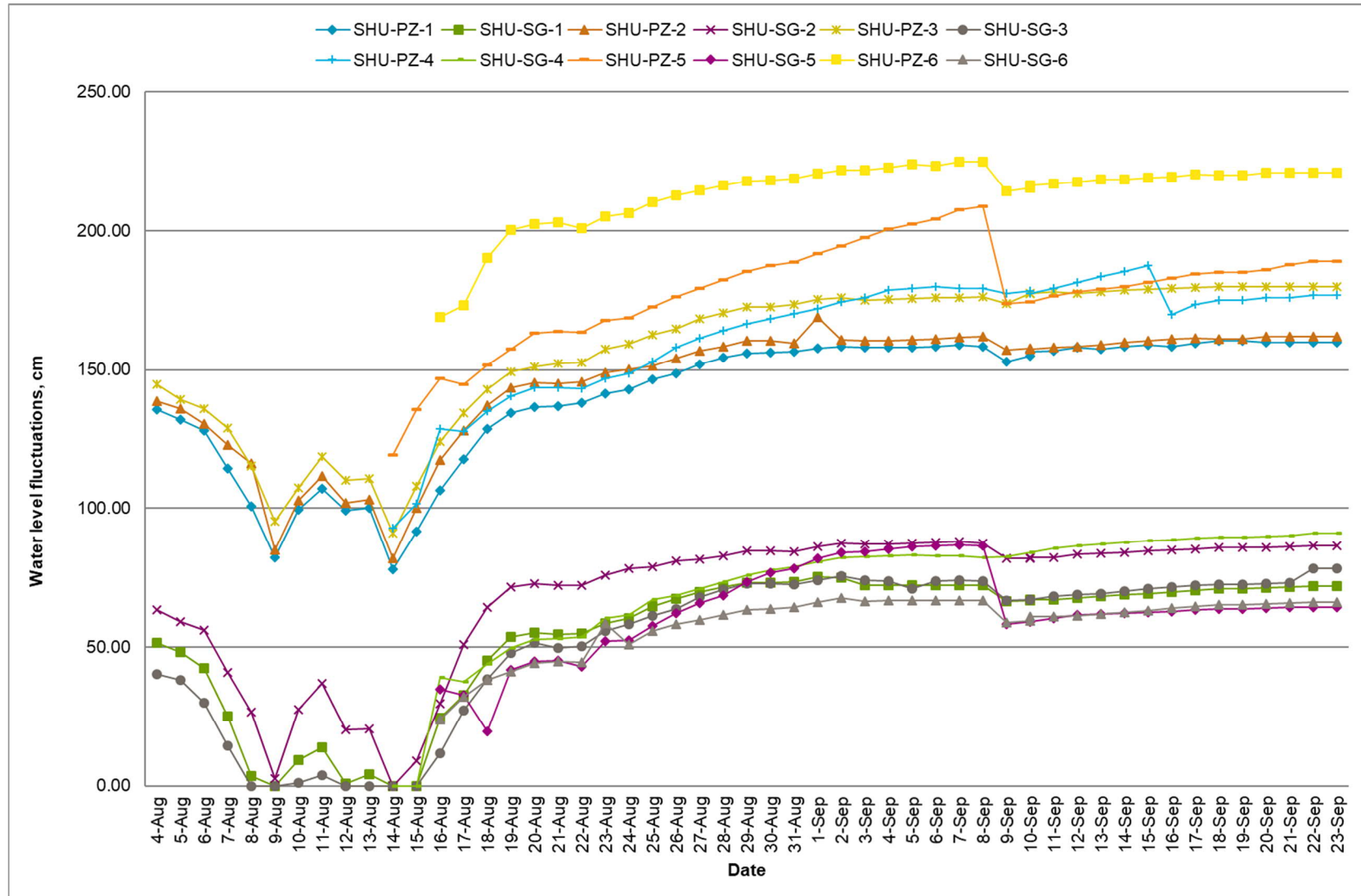


Figure 6-59 Surface Water-Groundwater Interaction at Shuvuun Wellfield (Aug.-Sept. 2019)

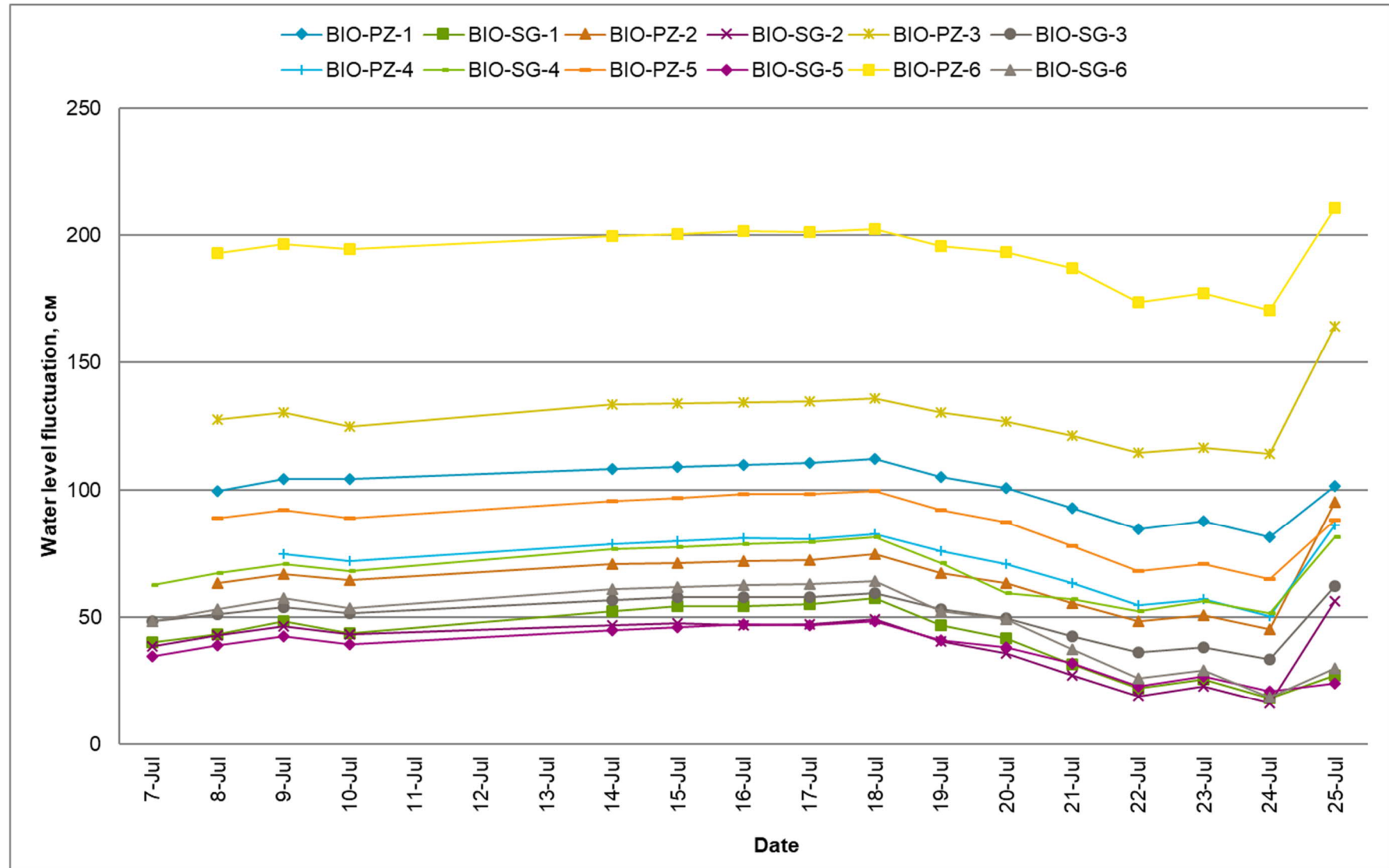


Figure 6-60 Surface Water-Groundwater Interaction at Biokombinat Wellfield (Jul. 2019)



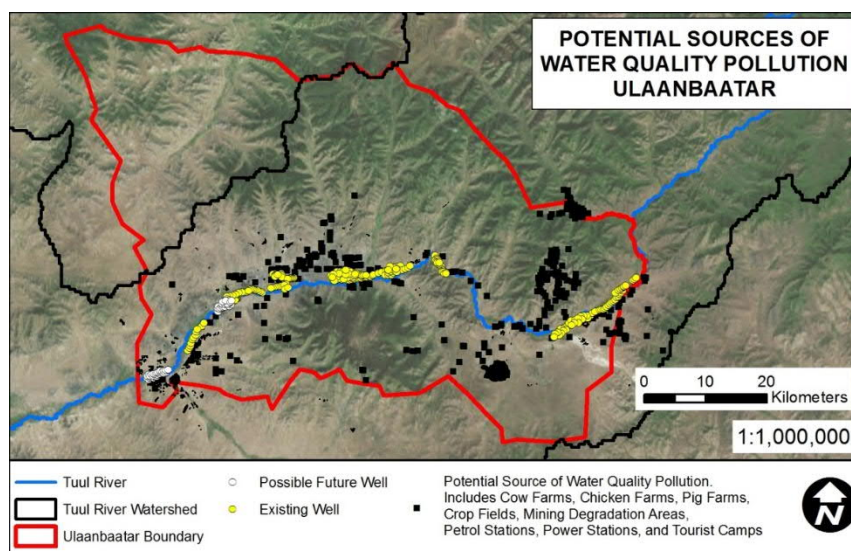
Figure 6-61 Fluctuations of Tuul River Surface Water Level at Shuvuun and Biokombinat Wellfields (Aug.- Oct. 2019)



## 6.1.9 Water Quality

### 6.1.9.1 Surface Water

Land use and human activity within and surrounding UB city contribute to water pollution in the Tuul River. Figure 6-62 displays sources of water pollution, including approximately 100 petrol stations, 200 tourist camps, and crop fields and animal farms (pig, cow, and chicken).



**Figure 6-62 Potential Sources of Water Quality Pollution - UB**

As noted previously, the CWWTP performs poorly, discharging partially treated wastewater to the Tuul River and causing surface and groundwater pollution downstream of the river outfall. Since its commissioning in 1964, overall operation of the plant has deteriorated, despite partial reconstruction and renewal (2030 Water Resources Group, 2016). Although incoming effluent quantities are within the CWWTP design parameters, incoming effluent quality has surpassed what the plant can effectively treat. The design capacity of the CWWTP is 230,000 cubic meters per day and, in 2014, the average daily inflow was approximately 159,000 cubic meters per day, with a maximum daily flow of 180,000 cubic meters per day (2030 Water Resources Group, 2016).

In addition to the CWWTP, there are four, comparatively small wastewater treatment plants that also discharge to the Tuul River. Two of the plants are located in Biokombinat: One plant treats wastewater from the village, with a capacity of approximately 600 cubic meters per day, and the second is for the vaccine factory and operates only during vaccine production. The third plant is located at Chinggis Khaan International Airport in Nisekh and has a capacity of about 2,000 cubic meters per day. Thanks to Turkish Government funds, the Buyant-Ukhua residential complex's 20,000-cubic meter wastewater treatment plant was constructed. It was commissioned in 2018 and is now fully operational. Effluent from this plant is conveyed through a 2.6-kilometer pipeline and merges with the Nisekh outfall. The locations of the CWWTP, and the Nisekh and Buyant-Ukhua wastewater treatment plants are shown in Figure 6-63.

CWWTP effluent, with high levels of biological and chemical contaminants entrained, discharges into the main channel of the Tuul River upstream and northwest of the proposed Biokombinat wellfield site. The year-round discharges of effluent from the CWWTP cause low dissolved oxygen concentrations downstream from the plant outfall. The waste from the plant contains high amounts of nutrients and other chemical substances that cause major reductions of dissolved oxygen, which in turn would kill aquatic fauna in the affected reach of the river (Altansukh and Davaa, 2011; Altansukh et al., 2012). Higher concentrations of dissolved oxygen tend to occur in autumn and lower values are likely in winter, with a steady increase from winter to autumn (Altansukh et

al., 2012). Due to the combination of constant discharge from the CWWTP throughout the year and changeable river flow, low dissolved oxygen concentrations are accompanied by high biological oxygen demand in winter, whereas dissolved oxygen values are relatively high and biological oxygen demand is low in summer (Altansukh et al., 2012). Altansukh et al. (2012) found that the CWWTP is the most important point source of pollution in the downstream sections of the Tuul River, with pollution still detected even 50 kilometers downstream of UB (Altansukh and Davaa, 2011; Altansukh et al., 2012).

In addition to the surface water quality degradation attributable to the CWTPP, the contaminated surface water that flows through and past Biokombinat and ultimately Shuvuun is subject to further contamination by wastewater effluent from the Biokombinat vaccine factory, which also is discharged to the Tuul River's main stem. Additionally, a secondary stream that flows through the proposed Shuvuun wellfield site also carries wastewater effluent and merges with the main stem of the Tuul River in the vicinity of the site.

On August 29 and 30, 2019, AECOM collected Tuul River surface water samples at 13 locations; 9 adjacent to the proposed Biokombinat wellfield site and 4 adjacent to the proposed Shuvuun wellfield site (see Figure 6-63). The samples were sent to KhanLab LLC for chemicals, heavy metals, and bacteria analysis and to SGS-Korea for volatile organic carbon (VOC) and total organic carbon (TOC) analysis. Both laboratories are internationally accredited.

### 6.1.9.2 Surface Water Quality

The water pollution index of surface water was calculated in order to assess Tuul River surface water quality in AoI. The water pollution index was initially proposed by Horton (Horton, 1965) and it has been applied and modified. Ministry of Nature and Environment of Mongolia (now MET) has developed water pollution index to simplify the complex set of water quality data, and it was used in this report (Ministry of Nature and Environment of Mongolia, 2006).

The classification of water pollution index and relevant uses and treatment issues are described in Table 6-19. The water pollution index was calculated as below equation.

$$WPI = (\sum (C_i / PL_i) / n)$$

Where; WPI- water pollution index,  $C_i$ - concentration of  $i$  variable,  $PL_i$ - permissible values of  $i$  variable,  $n$ - number of variables.

**Table 6-19 Classification of Surface Water Quality, Uses and Treatment**

WPI	Category	Classification	Uses and treatment
≤0.30	I	Very clean	Suitable for all kinds of water usage. No treatment needed
0.31- 0.89	II	Clean	After treatment, use for drinking and food production. Without treatment, use for fishery.
0.90 – 2.49	III	Slight pollution	Unsuitable for drinking and food production. If no choice, use it after treatment. Without treatment, use for livestock, recreation and sport purposes.
2.50 – 3.99	IV	Moderate pollution	Use for irrigation and industrial purposes after a proper treatment.
4.00 – 5.99	V	High pollution	After an appropriate treatment, heavy industrial use without body contact.
6.00≤	VI	Very high pollution	Unsuitable for any purpose. An extensive treatment requires
<b>Source: Ministry of Nature and Environment of Mongolia, 2006</b>			

Surface water oxygen parameters and nutrient concentrations are used for calculating water pollution index. Based on the August 2019 surface water data, water pollution index was calculated using chemical oxygen demand, biological oxygen demand, dissolved oxygen (as oxygen parameters), ammonium (NH<sub>4</sub>), nitrate (NO<sub>3</sub>), nitrite (NO<sub>2</sub>), and sulfate (SO<sub>4</sub>) concentrations (as nutrient concentrations which depends on pollution source). The permissible values were derived from MNS 4586:98.

As can be seen in Table 6-20, for the Tuul River adjacent to the proposed Biokombinat wellfield, sample SW-7 is in category VI, very high pollution; samples SW-2, SW-3, SW-5, SW-6, and SW-8 are in category III, slight pollution and SW-4 and SW-9 is in category IV, moderate pollution. For the river adjacent to the proposed Shuvuun wellfield, all four samples (SW-10, SW-11, SW-12, and SW-13) are in category VI, very high pollution.

**Table 6-20 Surface Water Pollution Index**

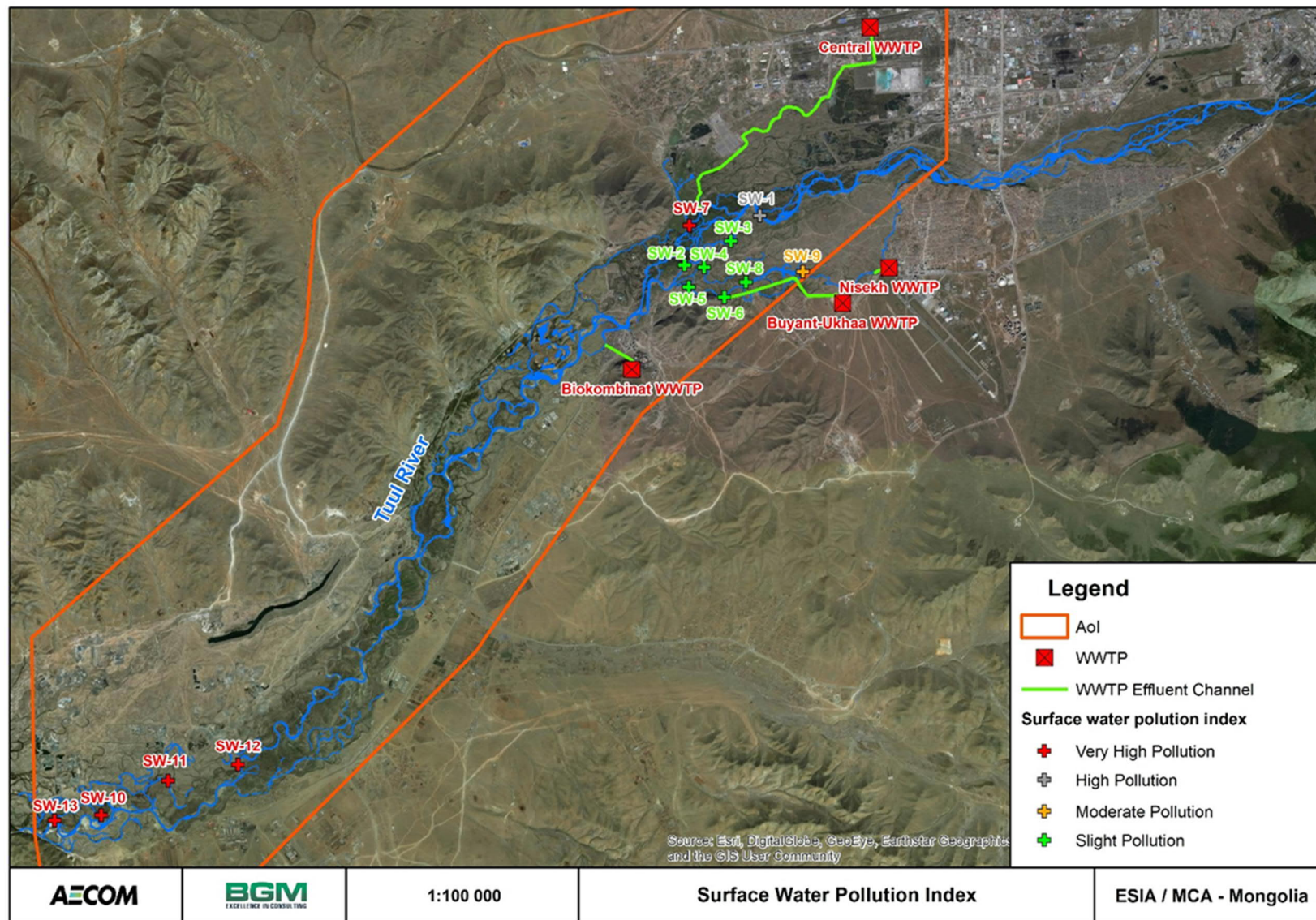
WPI	Category	Classification	Uses and treatment	Surface water sampling location	Calculated WPI
≤0.30	I	Very clean	Suitable for all kinds of water usage. No treatment needed		
0.31- 0.89	II	Clean	After treatment, use for drinking and food production. Without treatment, use for fishery.		
0.90 – 2.49	III	Slight pollution	Unsuitable for drinking and food production. If no choice, use it after treatment. Without treatment, use for livestock, recreation and sport purposes.	SW-2 SW-3 SW-5 SW-6 SW-8	2.03 1.34 1.36 1.42 1.05
2.50 – 3.99	IV	Moderate pollution	Use for irrigation and industrial purposes after a proper treatment.	SW-4 SW-9	2.67 2.66
4.00 – 5.99	V	High pollution	After an appropriate treatment, heavy industrial use without body contact.	SW-1	5.43
6.00≤	VI	Very high pollution	Unsuitable for any purpose. An extensive treatment requires	SW-7 SW-10 SW-11 SW-12 SW-13	21.55 20.74 25.19 19.07 22.00

These results are confirming the poor surface water quality of the Tuul River in Aol as shown Figure 6-63. The main source of Tuul River surface water pollution is direct outfall from CWWTP which is located in Aol.

The residential areas of the ger districts of Nisekh and new Nisekh and the Buyant-Ukhaa complex are situated at 1.5 to 2.0 km along the east side of Biokombinat wellfield area and are also sources of contamination. This is because the outfall of the Nisekh WWTP discharges to one of the streams of the Tuul River at a location southeast of Biokombinat wellfield. Also, outfall of the Buyant-Ukhaa WWTP is conveyed through a 2.6 km pipeline and discharges and merges with the Nisekh outfall at southwest of Biokombinat wellfield.

Moreover, Tuul River surface water is receiving the Biokombinat WWTP outfall (See Figure 6-63). The outfall from all WWTPs is diluted with Tuul River surface water and it then flows towards Shuvuun wellfield (see Figure 6-63). Thus, the outfall from all WWTPs is affected Tuul River surface water quality in Aol.





**Figure 6-63 Tuul River Surface Sampling Locations and Surface Water Sanitation Grade**

### 6.1.9.2.1 Chemicals and Heavy Metals

Table C-1 in Appendix C presents the results of the analysis for chemicals and heavy metals, and compares the concentrations of those surface water quality constituents in the samples to the Mongolian drinking water quality standards with MNS 0900:2018. The water quality standards are presented in Appendix A (e.g., Table A-3, Table A-4 and Table A-5). Figure 6-64 summarizes the findings for those water quality parameters for which exceedances of the applicable standard are noteworthy.

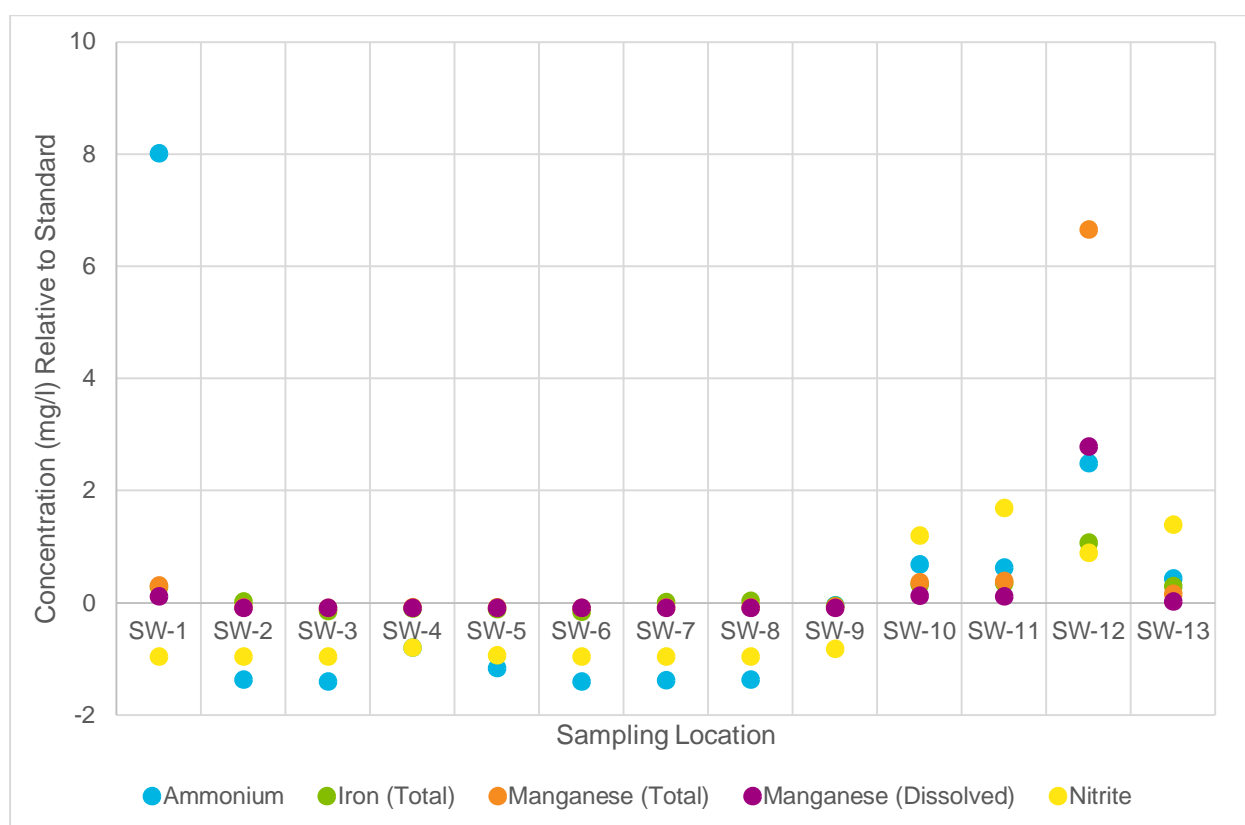


Figure 6-64 Surface Water General Chemistry and Heavy Metals, August 2019

Based on the August 2019 surface water data, the Tuul River adjacent to the proposed Biokombinat and Shuvuun wellfield sites was impacted with:

- Ammonium: 9.5 milligrams per liter at sampling location SW-1 adjacent to proposed Biokombinat wellfield site, and 1.9 to 4.0 milligrams per liter adjacent to Shuvuun site, exceeding the standard of 1.5 milligrams per liter
- Total iron: 0.6 milligrams per liter at sampling location SW-1, and 0.6 to 1.4 milligrams per liter adjacent to Shuvuun site, exceeding the standard of 0.3 milligrams per liter
- Total manganese: 0.4 milligrams per liter at sampling location SW-1, and 0.3 to 6.8 milligrams per liter adjacent to Shuvuun site, exceeding the standard of 0.1 milligrams per liter
- Dissolved manganese: 0.2 milligrams per liter at sampling location SW-1, and 0.1 to 2.9 milligrams per liter adjacent to Shuvuun site, exceeding the standard of 0.1 milligrams per liter
- Nitrite: 1.9 to 2.7 milligrams per liter adjacent to Shuvuun site, exceeding the standard of 1 milligrams per liter

The laboratory that performed the analysis for VOCs and TOCs, SGS-Korea, uses the United States Environmental Protection Agency (USEPA) detection limits and standard testing



methodology when testing for organic carbons. Table C-2 in Appendix C presents the results of the analysis. For the two samples that were collected, one each from locations SW-8 and SW-13, no VOC compounds were detected at the detection limits to which the laboratory tested. If any of the targeted VOCs are present in the surface water, they exist at concentrations lower than the USEPA regulatory criteria, which are the criteria that were used for this project, absent MNS criteria. TOCs were detected in the surface water at normal background concentrations.

#### 6.1.9.2.2 Bacteria

Bacteriological contamination of the Tuul River originates from both point and non-point sources. The outfalls of the wastewater treatment plants described earlier in Section 6.1.9.1 are point sources.

During the rainy season, in summer and autumn, effluent discharged from the CWWTP and the other wastewater treatment plants, as well as contaminants from nonpoint sources, mixes with Tuul River surface water and is conveyed by the river to the proposed Biokombinat and Shuvuun wellfield sites. Potentially, via secondary streams, meanders, flooding, and overland flow, this wastewater-laden surface water can be transported to the interiors of the sites. During the summer of 2019, the Tuul River overflowed its banks at the Biokombinat site, flooding portions of the site, and overland flow occurred on site. At the Shuvuun site, the river level approached the top of the riverbank but did not overflow the bank, and no overland flow was observed.

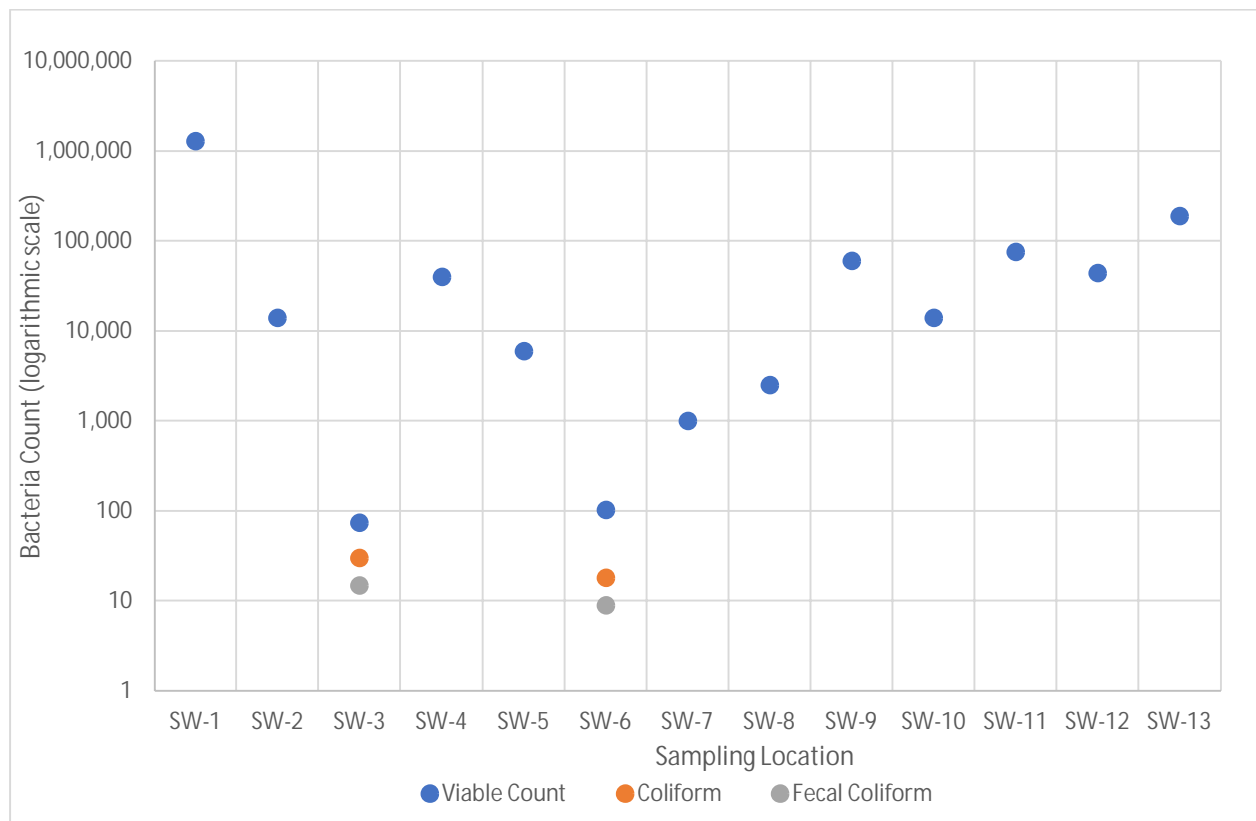
Beginning during the early part of the dry and cold winter season, ice forms in the river. During the coldest months, the ice layer is thick and extends to the bottom in many streams and Tuul River channels, although flow may continue at depth in the deeper river channels throughout the winter. This deep flow occasionally may work its way to the surface, creating surface flow that eventually freezes. Throughout the winter, wastewater effluent continues to flow downstream, either entrained in the surface water or separately, and under and over the ice layer.

Bacteriological analysis of the August 2019 Tuul river surface water samples was conducted. Laboratory results were compared against the Mongolian National Drinking Water Standards provided in Table 6-21. Table C-3 in Appendix C presents the results of the analysis and Table 6-21 summarizes the findings for total bacteria, coliform bacteria, and fecal coliform bacteria.

**Table 6-21 National Drinking Water Standards - Microbiological**

Constituent	MNS	Units	Maximum Permissible Level
<b>Total viable count</b>	MNS ISO 6222:1998	number/1 ml	100
<b>Total coliform</b>	MNS ISO 9308-1:1998	number/100 ml	Not detected in sample (ND)
<b>Total thermotolerant coliform and presumptive <i>Escherichia coli</i> - Fecal coliform</b>	MNS ISO 9308-1:1998	number/100 ml	ND
<b>Pathogenic bacteria (<i>Salmonella</i>)</b>	MNS ISO 19250:2017	number/25 ml	ND
<b><i>Clostridium perfringens</i></b>	MNS ISO 6461-2:1998	number/100 ml	ND

**Note:** ml indicates milliliter.



**Figure 6-65 Surface Water Bacteriology**

At all 13 surface water sampling locations in the Tuul River, analysis found exceedance of at minimum one applicable drinking water standard. Based on the August 2019 surface water data, the Tuul River adjacent to the proposed wellfield sites was impacted with:

- Total viable count: Ranged from 74 per milliliter at sampling location SW-3 to 1.3 million per milliliter at sampling location SW-1. Only the SW-3 sample did not exceed the standard of 100 per milliliter and the SW-6 sample (103 per milliliter) only nominally exceeded the standard.
- Total coliform: At all sampling locations the standard of no coliform bacteria detected was exceeded, with concentrations ranging from less than 0.00004 to 30 coliform (sampling location SW-3) per 100 milliliters.
- Fecal coliform: At the SW-3 and SW-6 sampling locations, the standard of no thermotolerant coliform bacteria and presumptive *Escherichia coli* detected was exceeded, with concentrations of 15 and 9 fecal coliform per 100 milliliters, respectively.
- *Salmonella* bacteria: No *Salmonella* bacteria were detected at any sampling location, meeting the standard of no *Salmonella* bacteria detected per 25 milliliters.
- *Clostridium perfringens*: This pathogenic, anaerobic bacteria was detected at all sampling locations except SW-3 and SW-6. At all of the other sampling locations, the standard of no *C. perfringens* detected was exceeded, with concentrations ranging from 0.00001 to 0.1 *C. perfringens* (sampling location SW-12) per 100 milliliters.

### 6.1.9.3 Groundwater

Under Mongolian law, the approvable groundwater resources of public and private well systems used for centralized and decentralized drinking water supply of any major city, village, and urban settlement must be assessed at the appropriate level before it can be delivered to consumers. As part of this process, an assessment of the water quality, chemical composition, and physical characteristics is conducted according to the “Environmental and Health Protection. Safety, Drinking Water, Hygiene Requirements, Quality and Safety Assessment” MNS 0900:2018 standards.

Specifications for laboratory water-quality testing are prepared in advance by the client and, based on the test results, technical determinations are made. During the 2018 feasibility study, many chemical parameters were tested. Similar detailed chemical testing was conducted in 2019 to qualify the groundwater reserve for drinking water purposes.

#### 6.1.9.3.1 Drilling and Testing Protocol

During the western wellfield hydrogeologic investigation in 2019, 273-millimeter-diameter exploratory borehole wells (EBWs) and 326-millimeter-diameter test pumping wells (TPWs) were installed on the proposed Biokombinat and Shuvuun wellfield sites to collect soil and groundwater samples. Eight EBWs were installed on the proposed Biokombinat wellfield site and 10 were installed on the Shuvuun site. Six TPWs were installed on Biokombinat and six were installed on Shuvuun. Figure 6-66 and Figure 6-67 show the locations of the wells installed on the proposed Biokombinat and Shuvuun wellfield sites, respectively.

The wells were pumped at a high rate, similar to the rate expected for the proposed production wells. The EBWs were pumped at a rate of 33 liters per second for 24 hours; whereas, the TPWs were pumped at a rate of 65 liters per second for approximately 72 hours.

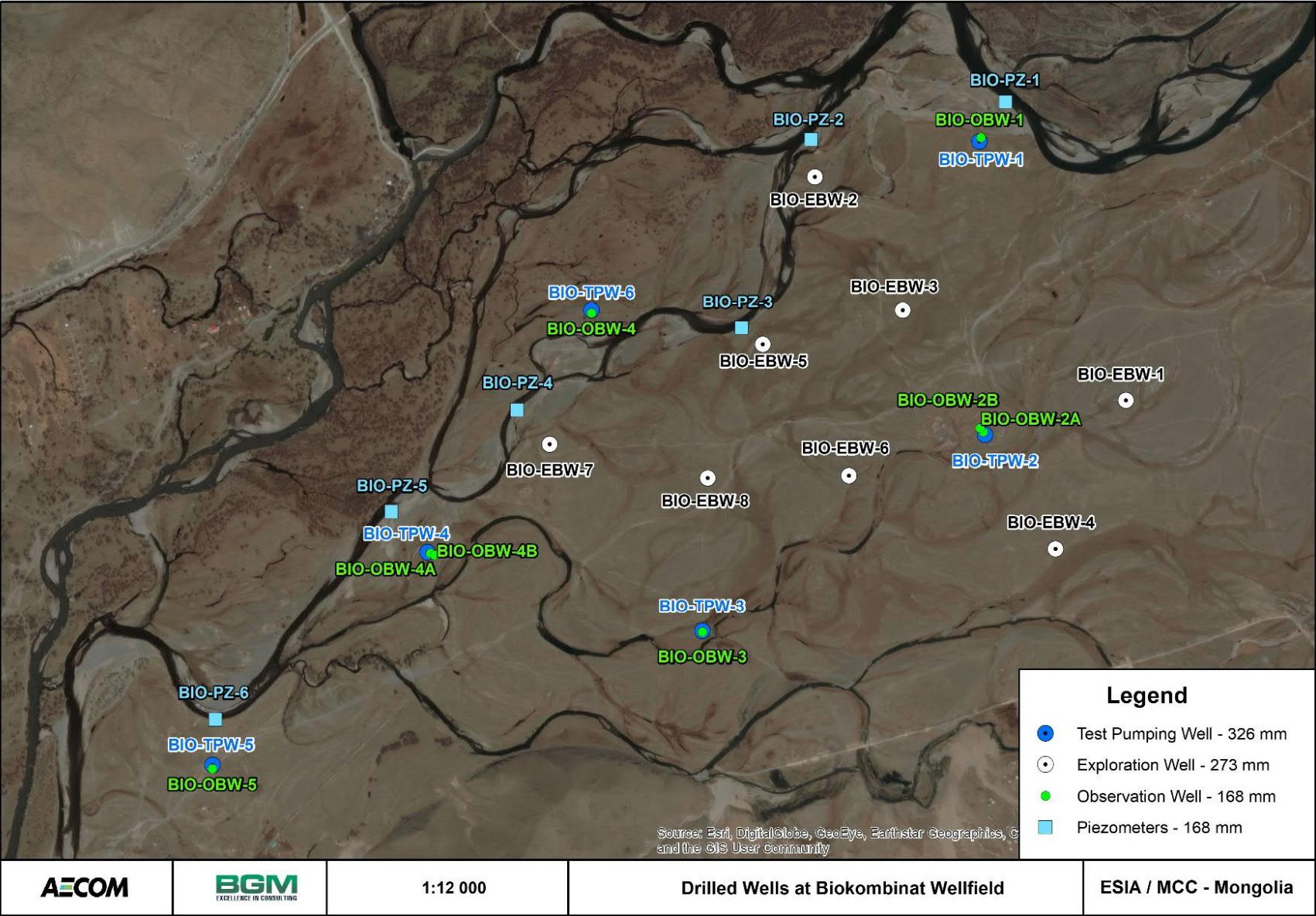


Figure 6-66 Drilled Wells - Proposed Biokombinat Wellfield Site



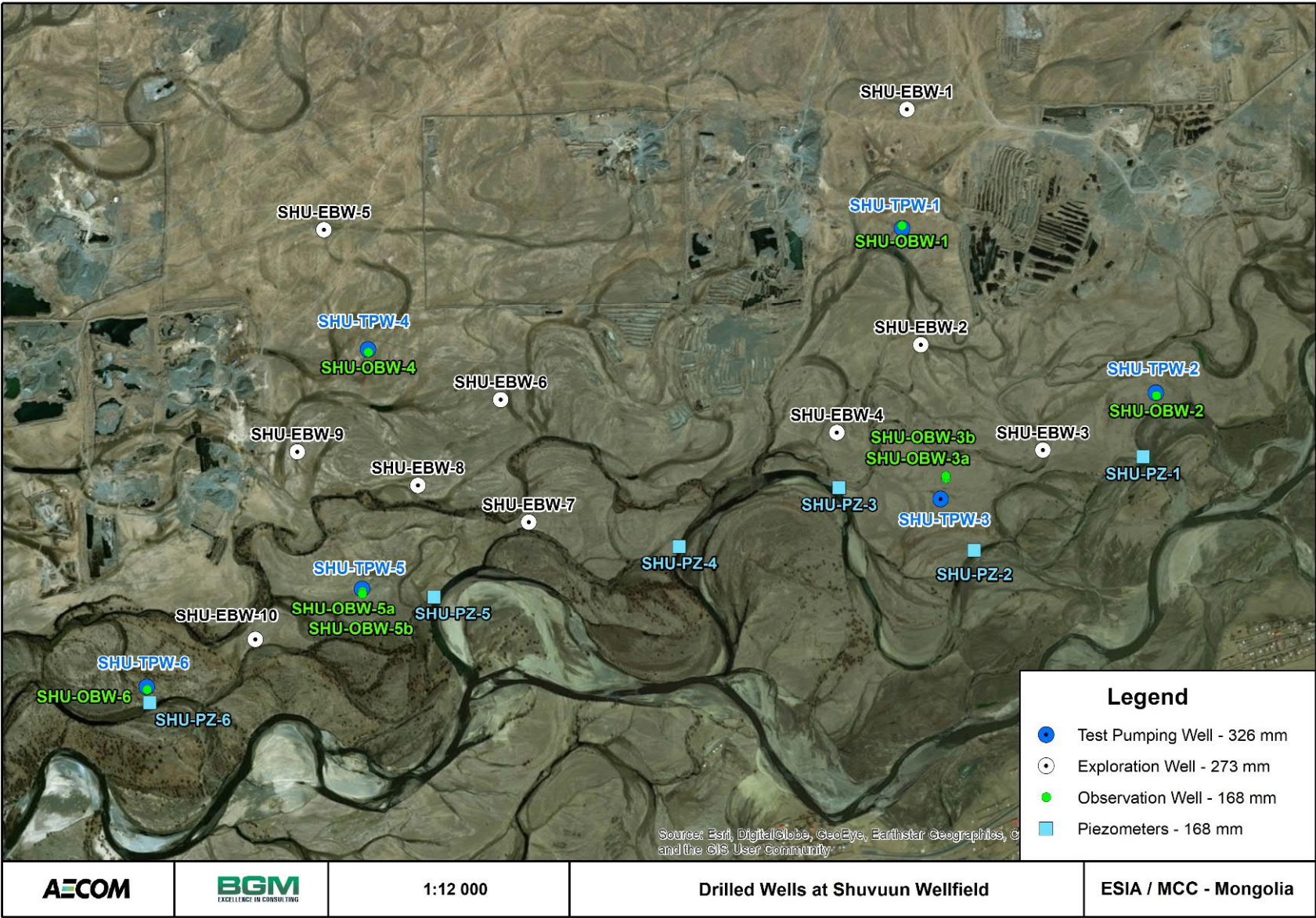


Figure 6-67 Drilled Wells - Proposed Shuvuun Wellfield Site



From July through September 2019, AECOM collected groundwater quality samples at the end of the constant-rate pumping tests from each of the EBWs. During the same time period, water quality samples also were collected typically at the beginning, middle, and end of the constant-rate pumping tests from each of the TPWs. The groundwater samples were analyzed for chemical, heavy metal, and bacteria constituents by KhanLab LLC and for VOCs and TOCs by SGS-Korea. Both laboratories are internationally accredited. Based on the results of the analyses, the groundwater quality characteristics were assessed against the norms for sanitation grade of surface water and the Mongolian drinking water quality standards at MNS 0900:2018 (see Appendix C, Table C-6 and Table C-7).

In the United States, drilling and sampling equipment, and wells are disinfected with chlorine prior to the start of the pumping tests and before taking any water quality samples. In general, the wells are chlorinated for approximately 12 hours to kill bacteria that may have been introduced through the drilling process. However, in most cases disinfecting the wells during the 2019 wellfield hydrogeologic investigation; either wells were not chlorinated or were not chlorinated for an adequate length of time. The first wells sampled during the 2019 investigation were not disinfected prior to pump testing, because disinfection is not a standard drilling protocol in Mongolia.

Therefore, the pump testing protocol was amended to incorporate disinfecting the few remaining wells that had not been tested, and to add resampling, after disinfection, of one previously sampled well at each proposed wellfield site.

Under the amended drilling protocol, for the TPWs the following sequential steps were undertaken at the remaining wells:

- First of the three samples was collected at the beginning of the constant-rate pumping test
- Drillers added 2.0 liters of fully concentrated chlorine bleach directly into the well
- Bleach was allowed to mix with the well water for at least one hour
- Any mud, horse dung, cow dung, or other potential medium for contaminants that was caked onto the pumping apparatus was wiped off
- As the drillers lowered it into the well, the pumping apparatus was sprayed down with a 1:7 chlorine bleach-to-water solution using a hand-pump sprayer
- All equipment surfaces, nuts, bolts, and electrical wiring in the well also were sprayed with solution
- Well was pumped for at least 24 hours before collecting the second sample
- Well was pumped for 65 to 94 additional hours before collecting the third and final sample

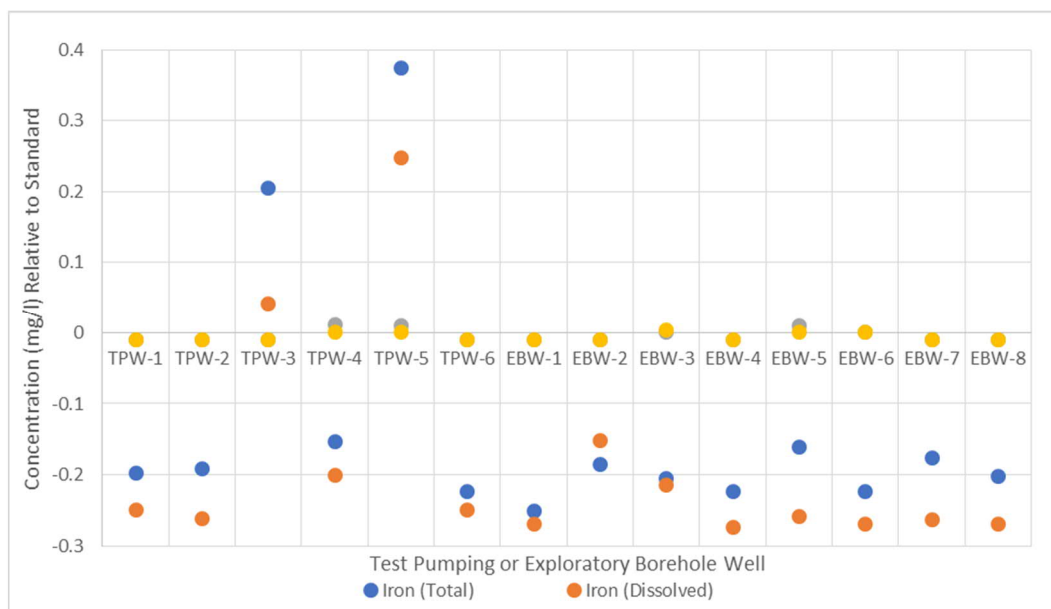
For both the resampled wells and the remaining EBWs that had not been tested previously, the well was pumped for 24 hours before collecting the single sample.

After 24 hours of pumping an EBW at 33 liters per second, the pump would have extracted and discharged approximately 2.8 million liters of groundwater. Likewise, after 24 hours of pumping a TPW at 65 liters per second, the pump would have extracted and discharged approximately 5.6 million liters of groundwater. Long before collecting the single sample at a resampled well or an EBW, or the second sample at a TPW, the chlorine bleach would have been washed through the pumping apparatus and the well would have been rinsed out. Therefore, the disinfection solution would not have contaminated the samples.

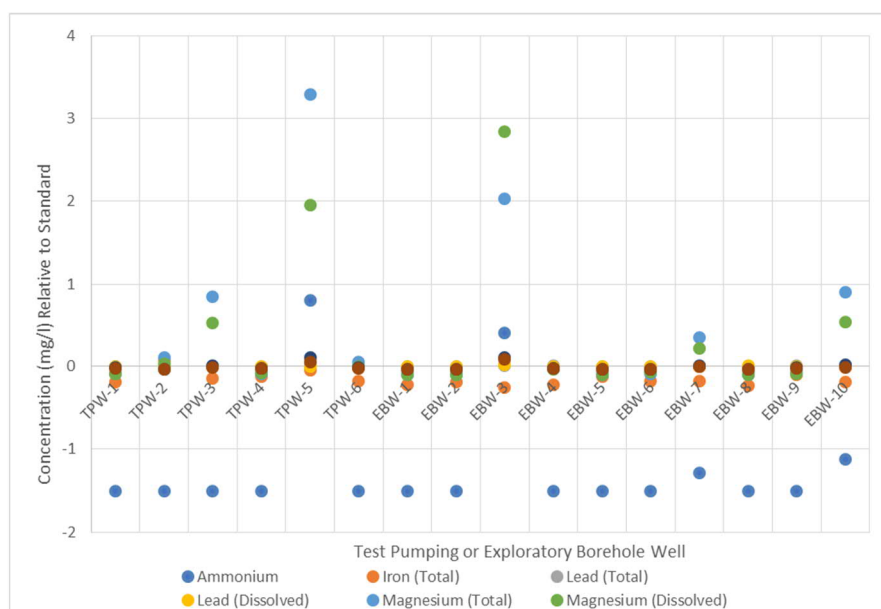
#### **6.1.9.3.2 Chemicals and Heavy Metals**

Table C-4 and Table C-5 in Appendix C summarize the results of the laboratory analyses for specific groundwater chemical and heavy metal parameters at the Biokombinat and Shuvuun wellfields. As discussed in Section 6.1.9.1, the findings of the August 2019 surface water sampling

confirm the poor water quality of the Tuul River downstream of the CWWTP effluent outfall and adjacent to the two proposed wellfield sites. However, groundwater quality on the sites was generally good, although for some naturally occurring constituents and some bacteriological indicators groundwater quality was not in compliance with MNS 0900:2018. Figure 6-68 and Figure 6-69 summarize the findings for those water quality parameters for which exceedances of the applicable standard are noteworthy.



**Figure 6-68 Biokombinat Groundwater Heavy Metals, July-September 2019**



**Figure 6-69 Shuvuun Groundwater General Chemistry and Heavy Metals, July-September 2019**

Based on the July through September 2019 groundwater quality data, the following wells at the proposed Biokombinat and Shuvuun wellfield sites were impacted with the indicated contaminants and were not in compliance with MNS 0900:2018:

## **Biokombinat**

- Total and dissolved iron: 0.34 to 0.67 milligrams per liter at TPW-3 and TPW-5 compared to 0.3-milligrams per liter standard
- Total lead: 0.014 to 0.021 milligrams per liter at TPW-4, TPW-5, and EBW-5 compared to 0.01-milligrams per liter standard
- Dissolved lead: 0.014 milligrams per liter at EBW-3 compared to 0.01-milligrams per liter standard

## **Shuvuun**

- Ammonium: 1.90 to 2.31 milligrams per liter at TPW-5 and EBW-3 compared to 1.5-milligrams per liter standard
- Total iron: 0.37 milligrams per liter at TPW-2 compared to 0.3-milligrams per liter standard
- Total lead: 0.012 to 0.020 milligrams per liter at TPW-2, TPW-5, EBW-3, EBW-4, and EBW-9 compared to 0.01-milligrams per liter standard
- Dissolved lead: 0.015 to 0.023 milligrams per liter at EBW-3 and EBW-8 compared to 0.01-milligrams per liter standard
- Total manganese: 0.15 to 3.39 milligrams per liter at TPW-2, TPW-3, TPW-5, TPW-6, EBW-3, EBW-7, and EBW-10 compared to 0.1-milligrams per liter standard
- Dissolved manganese: 0.13 to 2.94 milligrams per liter at TPW-2, TPW-3, TPW-5, EBW-3, EBW-7, and EBW-10 compared to 0.1-milligrams per liter standard
- Total selenium: 0.041 to 0.148 milligrams per liter at TPW-3, TPW-5, EBW-3, EBW-7, and EBW-10 compared to 0.04-milligrams per liter standard
- Dissolved selenium: 0.075 to 0.125 milligrams per liter at TPW-5 and EBW-3 compared to 0.04-milligrams per liter standard

These chemicals and heavy metals are naturally occurring (AECOM, 2019a). Analysis of the groundwater quality samples shows that the wells drilled in 2019 generally have similar water quality composition. However, at some wells, the chemical and heavy metal constituents have exceeded the recommended water quality standards. Apart from those constituents specified above, all other chemicals and heavy metals meet the Mongolian MNS 0900:2018 standards. Based on the investigations carried out in 2019, the baseline groundwater quality conditions in the alluvial aquifer are good. However, it needs to be noted that the proposed wellfield sites have been subjected to extensive contamination and deliberate technogenic degradation.

SGS-Korea used the USEPA detection limits and standard testing to analyze groundwater samples for VOCs and TOCs. Table C-6 and Table C-7 in Appendix C presents the results of the analysis. No VOC compounds were detected in the groundwater samples at the detection limits to which the laboratory tested. If any of the targeted VOCs are present in the groundwater, they exist at concentrations lower than the USEPA regulatory criteria, which are the criteria that were used for this project, absent MNS criteria. TOCs were detected in the groundwater at normal background concentrations.

### **6.1.9.3.3 Bacteria**

The CWWTP discharges to the main channel of the of the Tuul River, which flows to the west of the proposed Biokombinat wellfield site and, therefore, does not directly contribute to flooding on the Biokombinat site. The surface water in the on-site secondary streams is relatively clean and originates from the river valley upstream of the CWWTP effluent outfall, but may carry effluent from the Nisekh wastewater treatment plant and contaminants from other sources in UB city. CWWTP effluent may indirectly contribute to flooding on the Biokombinat site in that the Tuul River main channel and the secondary streams join just downstream of the site, where the river

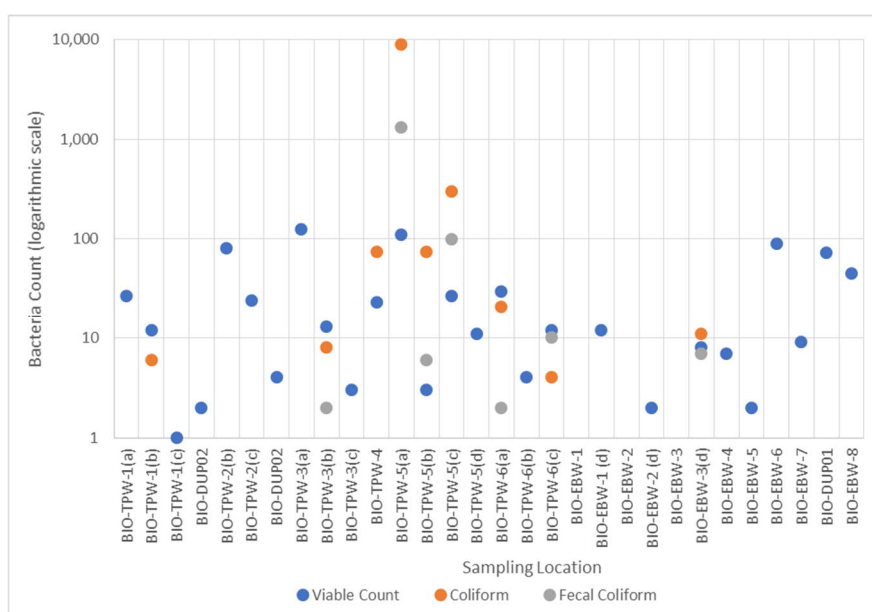
valley narrows. At the proposed Shuvuun wellfield site, CWWTP effluent does contribute directly to flows in the adjacent Tuul River and the secondary streams, and to flooding on site.

During the winter, wastewater effluent continues to flow downstream in the Tuul River and secondary streams, either entrained in the surface water or separately. The wastewater can overflow the riverbanks and spread out over the floodplain, where it freezes. The wastewater-laden ice layer typically extends downstream from the Combined Heat & Power Plant 4 wellfield, past the Tavan Tolgoi Bridge, and past or through the Biokombinat and Shuvuun sites, covering the riparian zone throughout an expanse of the Tuul River Valley. During the springs of 2019 and 2020, wastewater solids were observed at the Shuvuun site in the channel, and along and near the bank of some streams.

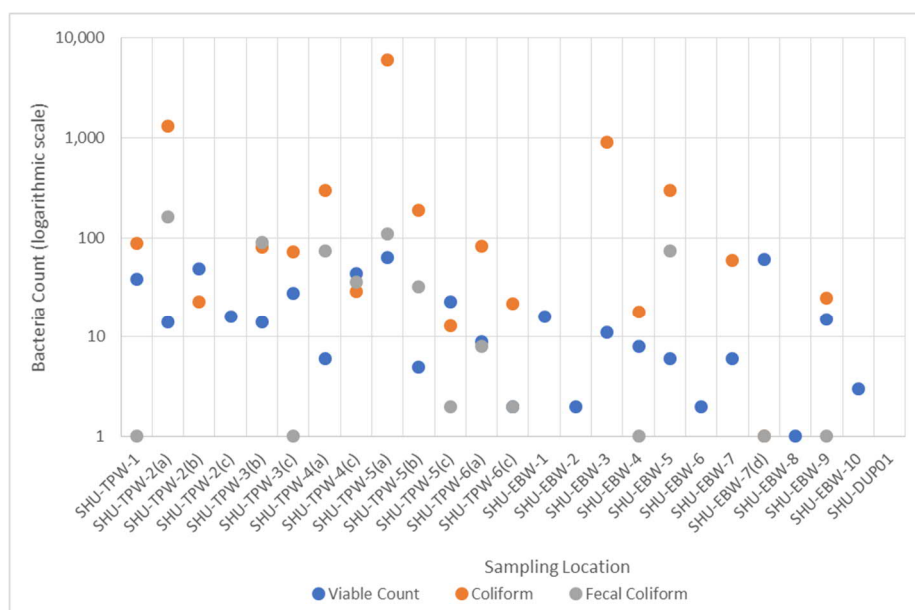
During the early months of spring, the thick wastewater-laden ice layers begins to melt. As the melting continues and river flows increase, a portion of the meltwater, and the entrained wastewater solids and other nonvolatile constituents, discharges to the river and the streams, and a portion infiltrates into the groundwater in the alluvium.

Water samples obtained from TPWs and EBWs were delivered to KhanLab LLC for bacteriological analysis. Laboratory results were compared against the Mongolian National Drinking Water Standards provided in Table 6-21. Table C-8 and Table C-9 in Appendix C present the results of the analysis, and Figure 6-70 and Figure 6-71 summarize the findings for total bacteria, coliform bacteria, and fecal coliform bacteria.

As discussed in Section 6.1.9.2.2, although the wells should have been disinfected with chlorine prior to the start of the pumping tests, in most cases wells were not chlorinated or were not chlorinated for an adequate length of time. This omission potentially undermines the validity of some of the findings of the bacteriological analysis presented below. However, it can reasonably be assumed that, to some unquantifiable extent, observed high concentrations of bacteria were in part attributable to bacteria having been introduced at the wells through the drilling process, rather than to more widespread presence of bacteria in the groundwater. This likely would be true especially in instances when bacteria concentrations were high at the beginning of the constant-rate pumping tests but then dropped substantially as pumping continued. Conversely, if bacteria concentrations remained high throughout the tests, it can be assumed that the bacteria were present at high concentrations in the ambient groundwater.



**Figure 6-70 Biokombinat Groundwater Bacteriology**



**Figure 6-71 Shuvuun Groundwater Bacteriology**

For just over half (17 out of 30) test pumping and exploratory borehole wells at the proposed Biokombinat and Shuvuun wellfield sites, analysis found exceedance of at least one applicable bacteriological drinking water standard. Based on the July through September 2019 groundwater water data, the groundwater at the proposed wellfield sites was impacted with:

### Biokombinat

- Total viable count: Groundwater samples collected from TPW-3 and TPW-5 at the beginning of the constant-rate pumping tests exceeded the standard of 100 per milliliter, with total viable counts of 124 and 110, respectively. The counts dropped below the standard as pumping continued. No samples from EBWs exceeded the standard.
- Total coliform: Samples from five TPWs exceeded the standard of no coliform bacteria detected, with concentrations ranging from 4 to 8,900 coliform (TPW-5 at the beginning of pumping) per 100 milliliters. A sample from EBW-3 also exceeded the standard, with a concentration of 11 per 100 milliliters.
- Fecal coliform: Exceeding the standard of no thermotolerant coliform bacteria and presumptive *Escherichia coli* detected, fecal coliform were detected in samples from three TPWs. Concentrations ranged from 2 to 1,300 (TPW-5 at the beginning of pumping) per 100 milliliters. As for total coliform, a sample from EBW-3 also exceeded the fecal coliform standard, with a concentration of 7 per 100 milliliters.
- *Salmonella* bacteria: No *Salmonella* bacteria were detected in samples from any TPWs or EBWs, meeting the standard of no *Salmonella* bacteria detected per 25 milliliters.
- *Clostridium perfringens*: *Clostridium perfringens* was not detected in samples from any TPWs or EBWs, meeting the standard of not detected in 100-milliliter samples.

### Shuvuun

- Total viable count: For all samples collected from all TPWs and EBWs, total viable counts were below the standard of 100 per. Although below the standard, the sample with the highest count was collected from TPW-5 at the beginning of the constant-rate pumping test, with a total viable count of 64.
- Total coliform: Samples from six TPWs exceeded the standard of no coliform bacteria detected, with concentrations ranging from 6 to 6,000 coliform (TPW-6 at the beginning of



pumping) per 100 milliliters. Samples from five EBWs also exceeded the standard, concentrations ranging from 1 to 910 (EBW-3) per 100 milliliters.

- **Fecal coliform:** Fecal coliform were detected in samples from six TPWs, exceeding the standard of no thermotolerant coliform bacteria and presumptive *Escherichia coli* detected. Concentrations ranged from 1 to 160 (TPW-2 at the beginning of pumping) per 100 milliliters. Samples from four EBWs also exceeded the fecal coliform standard, with concentrations ranging from 1 to 74 (EBW-5) per 100 milliliters.
- **Salmonella bacteria:** No *Salmonella* bacteria were detected in samples from any TPWs or EBWs, meeting the standard of no *Salmonella* bacteria detected per 25 milliliters.
- **Clostridium perfringens:** *Clostridium perfringens* was not detected in samples from any TPWs or EBWs, meeting the standard of not detected in 100-milliliter samples.

It is noteworthy that at least one bacteriological standard was exceeded at all TPWs except one (TPW-2) on the proposed Biokombinat wellfield site, and at all TPWs on the Shuvuun site. Contrarily, one or more standard was exceeded at only one of eight EBWs on the Biokombinat site and at only five of 10 EBWs on the Shuvuun site. However, this apparent pattern may be an artifact of the wells' not being properly disinfected prior to the start of the pumping tests, as discussed above. One other potential source of surface and groundwater pollution is ongoing gravel mining activities on the proposed Shuvuun wellfield site.

#### 6.1.9.4 Overview of Surface and Ground Water Quality

Investigations conducted by Altansukh and Davaa (2011), Dorjsuren et al., (2015b), Byambakhuu et al. (2016), and Tuul River Basin Council (2018) include of multiple years data. Specially, there was a detailed study focused on dissolved oxygen, permanganate, ammonium, and total phosphate between 1998 and 2015. Looking at the results from these studies, it is noted that the main contamination source is from the Central Wastewater Treatment Plant (CWWTP). Studies conducted within between 2017 and 2019 BWSE project, the water quality of the Western new water supply determined to be exceeding the drinking water standards. The results are shown in Table 6-22 and Table 6-23.

**Table 6-22 Water Quality Parameters Exceedances - Western Water Supply Investigation, 2017**

Location	Parameter	Result (mg/l)	Explanation
<b>CWWTP effluent</b>	Ammonium	3.00-4.00	Ammonium exceeded the standard by 1 mg/l at all the five samples. Nitrate and ammonium didn't have specific results, concentration was lower than expected.
<b>CWWTP effluent</b>	Coliform	Detected Detected	Detected on all five samples. Detected on three samples from downstream source.
<b>CWWTP effluent</b> <b>CHP3-OW1-1</b> <b>CHP4-TW1-1</b>	Total, Iron	0.408-0.582 1.213 1.27	Exceeded the MNS standard by 0.3 mg/l on two samples. It is possible that effluent had chemical effect which reduces iron content. Dissolved iron content of the effluent is 80 percent while it is only 20 percent for the well sample.
<b>CWWTP effluent</b> <b>TUUL-RIV-5, 7</b> <b>CHP4-TW1-1, CHP4-OW1</b> <b>SHU-TW2-1, SHU-TW2-2, SHU-OW3-1</b>	Total, Manganese	1.01-1.29 0.186-0.384 0.643-2.814 0.379-0.524	Exceeded the MNS standard by 0.1 on all five samples. Effluent is shown to have dissolved in river and groundwater.
<b>CWWTP effluent</b>	Total, Chromium	0.064	One sample exceeded the MNS standard by 0.1 mg/l. It was detected on all five samples, but it is under the standard limit for surface and groundwater samples.

Location	Parameter	Result (mg/l)	Explanation
<b>CWWTP effluent CHP4-OW2</b>	Selenium, Total	0.02-0.03 0.02	Selenium was detected on all five samples, and it exceeded the WHO limit by 0.01 mg/l and did not exceed MNS limit. CHP4-OW2 had similar results.
<b>TUUL-RIV-5, 6, 7 CHP3-OW1-1</b>	VOC: Trichlorethylene Tetrachlorethylene Trichlorethylene (TCE)	5.64 7.69 92.3	Upstream source did not have any VOCs. All the effluent samples had large content level of VOCs. In the river the detection was moderate. Trichlorethylene level exceeded the USEPA level in TUUL-RIV-5 sample. Trichlorethylene level exceeded the USEPA level in CHP-3 sample.

**Note:** mg/l indicates milligrams per liter.

**Table 6-23 Water Quality Parameters Exceedances - Western Water Supply Investigation, 2018**

Location	Parameter	Result (mg/l)	Explanation
<b>BIO-river CHP4- river SHU- river</b>	Ammonium	8.00-70.00 20.00-95.00 20.00-80.00	Lab results show contamination has exceeded the standard. Samples were taken at a location close to the contamination source in BIO.
<b>BIO- river CHP4- river SHU- river</b>	Coliform	absent-62/100mL 18-68/100mL 6-24/100mL	Khan lab results showed detection of Coliforms.
<b>CHP4- river</b>	Chloride	665	Only one sample has exceeded the MNS limit of 350 mg/l.
<b>SHU- river</b>	Total, Iron	0.316-0.323	Dissolved iron in the river sample were above 90 percent.
<b>BIO- river CHP4- river SHU- river</b>	Total, Manganese	0.757-1.420 1.171-5.207 1.511-1.793	Manganese has exceeded the limit for the samples that is 95 percent dissolved.
<b>BIO- river CHP4- river</b>	Total, Chromium	0.052-0.060 0.114	2 samples of BIO-river and a sample of river nearby CHP-4 have exceeded the MNS limit by 0.05 mg/l.
<b>BIO- river CHP4- river SHU- river SHU-OW1-GW</b>	Total, Lead	<0.01-0.016 <0.01-0.076 0.01-0.020 0.014	Several samples from the river and observation well at Shuvuun wellfield exceeded the MNS limit of 0.01 mg/l.
<b>CHP4- river</b>	Total, Selenium	0.055-0.58	Sample taken from river in the CHP4 has exceeded MNS limit. All the samples from the river and wells have exceeded the WHO limit of 0.01 mg/l.
<b>BIO- river CHP4- river SHU- river</b>	Dissolved oxygen	<0.3 <0.3 <0.3	Only three samples from BIO river had measurable dissolved oxygen levels. Oxygen levels of the most samples from the river were decreased.
<b>BIO- river CHP4- river SHU- river</b>	(TOC)	1.26-1,240 954-1,920 30-1,062	Even though it is not set in the MNS, samples from BIO area river were detected with large amounts. It was detected on all the samples from CHP4 and some samples from Shuvuun wellfield.

**Notes:** mg/l indicates milligrams per liter.

Looking at the water quality analysis results in 2017, there was a high level of Iron, Manganese, Selenium, Lead, Chromium, Coliform, and VOC detection from the samples taken at CWWTP effluent. The samples taken from the surface and groundwater in 2018 and 2019, the parameters above also exceeded the limit proving the previous analysis. Thus the conclusion is that the main source of contamination at the site is CWWTP effluent.

In 2017, observation well CHP4-OW1 had been detected with high level of VOCs. Groundwater is possibly contaminated due to the surface water which flows in close proximity to the CWWTP effluent.

Samples taken at effluent, at contaminated Tuul River flow, and at the wells drilled nearby to these areas showed a detection of coliforms, bacteria, and pathogens repeatedly. This indicates direct relationship of the contamination. However, the planned reconstruction of the CWWTP and resulting improvements to the plant's treatment processes are expected to lead to significant decreases in contamination levels in the Tuul River and to be effective at providing additional cleaning of the sludge in the river.

#### **6.1.9.5 Tuul River Sediment as a Potential Source of Contamination**

AECOM undertook the Tuul River Sediment Sampling Program to quantify the settled solids and characterize the contaminants in river sediments downstream of the CWWTP effluent discharge. The study methodology is detailed in the Tuul River Sediment Sampling Final Report (AECOM, 2019b) and are briefly summarized here, along with the findings of the study that are pertinent to the river sediments as a potential source of contamination for both surface water and groundwater quality.

Commencing downstream of the CWWTP effluent discharge, sampling was performed at 500-meter intervals for the first 5 kilometers; then at 1-kilometer intervals for 20 kilometers; and then at 2-kilometer intervals for the remaining 10 kilometers of the primary 35-kilometer stretch of the river. Sampling was also undertaken along six transects in the side stream of the river where the CWWTP effluent discharge was previously located. Sampling was performed at three more transects downstream in Altan-Bulag (approximately 55 kilometers) and Lun soums (approximately 310 kilometers) of Tuv aimag.

Sediment samples were collected using core and grab sampling:

- Core sampling was used to collect sediment profiles for the determination of the vertical distribution of sediment characteristics. Each core sample collected at the river centerline was pretreated, preserved, and analyzed to determine total, fixed, and volatile solids, in accordance with USEPA Method 1684 (USEPA, 2001a), with the intent that volatile solids content would be used as a surrogate parameter for sludge content in quantifying the settled solids in the river.
- Grab sampling was used to collect surficial sediments for the assessment of the horizontal distribution of sediment characteristics. Each grab sample taken at the river centerline was pre-treated, preserved and analyzed by the laboratory for total phosphorus (TP), total nitrogen (TN), and metals.

A total of 127 core and 46 grab samples of Tuul River sediment were collected from 47 transects. River widths for all transects were measured. All core sample lengths were measured, as was the length of and each distinct sediment layer, distinguished by visual observations with a color scale. These lengths were used as a parameter for calculating volume of sludge volume in river sediments. Most sediment cores clearly showed two or more layers, reflecting the historic variation in sediment accumulation and transport along the river course.

##### **6.1.9.5.1 Solids and Contaminants**

The laboratory analytical results for total, fixed, and volatile solids for the center core samples are shown in Table C-10 in Appendix C. In all core samples most of the total solids are volatile solids, comprising 74 to 99 percent of the total solids. This confirms the high organic content in these solids and that the largest single source of organic loads to the Tuul River is the CWWTP effluent discharge. The highest concentrations of the fixed and volatile solids were observed between sites P-1 and P-3 along the side stream of the river where the CWWTP effluent discharge was previously located, and at some sites along primary 35-kilometer stretch of the Tuul River.

Laboratory results for TP, TN, and metals—aluminum (Al), copper (Cu), iron (Fe), manganese (Mn), nickel (Ni), zinc (Zn), arsenic (As), selenium (Se), cadmium (Cd), lead (Pb), and chromium

(Cr)—for the center grab samples are shown in Table C-11 in Appendix C. There is no Mongolian national standard for evaluation of contamination levels of heavy metals in river sediment. Thus, two internationally accepted assessment parameters, namely the threshold effect level (TEL) and possible effect level (PEL) introduced by Smith et al. (1996), are used for this evaluation. These parameters are described as follows:

- If a value exceeds the TEL, the health of the biota in the environment may be adversely affected.
- If a value exceeds the PEL, the health of biota in the environment would be adversely affected.

The parameters provide a tool with which environmental risk can be assessed in future studies (Long et al., 1995; Smith et al., 1996; MacDonald et al., 2000; Burton, 2002). Metals concentrations in the Tuul River sediments were compared against the TELs and PELs for those metals for which levels are established; i.e., copper, nickel, zinc, arsenic, cadmium, lead, and chromium. Sampling locations which exceeded the TELs and PELs are shown in Figure 6-72 and Figure 6-73, and the corresponding concentrations in milligrams per kilogram are provided in Table 6-24.

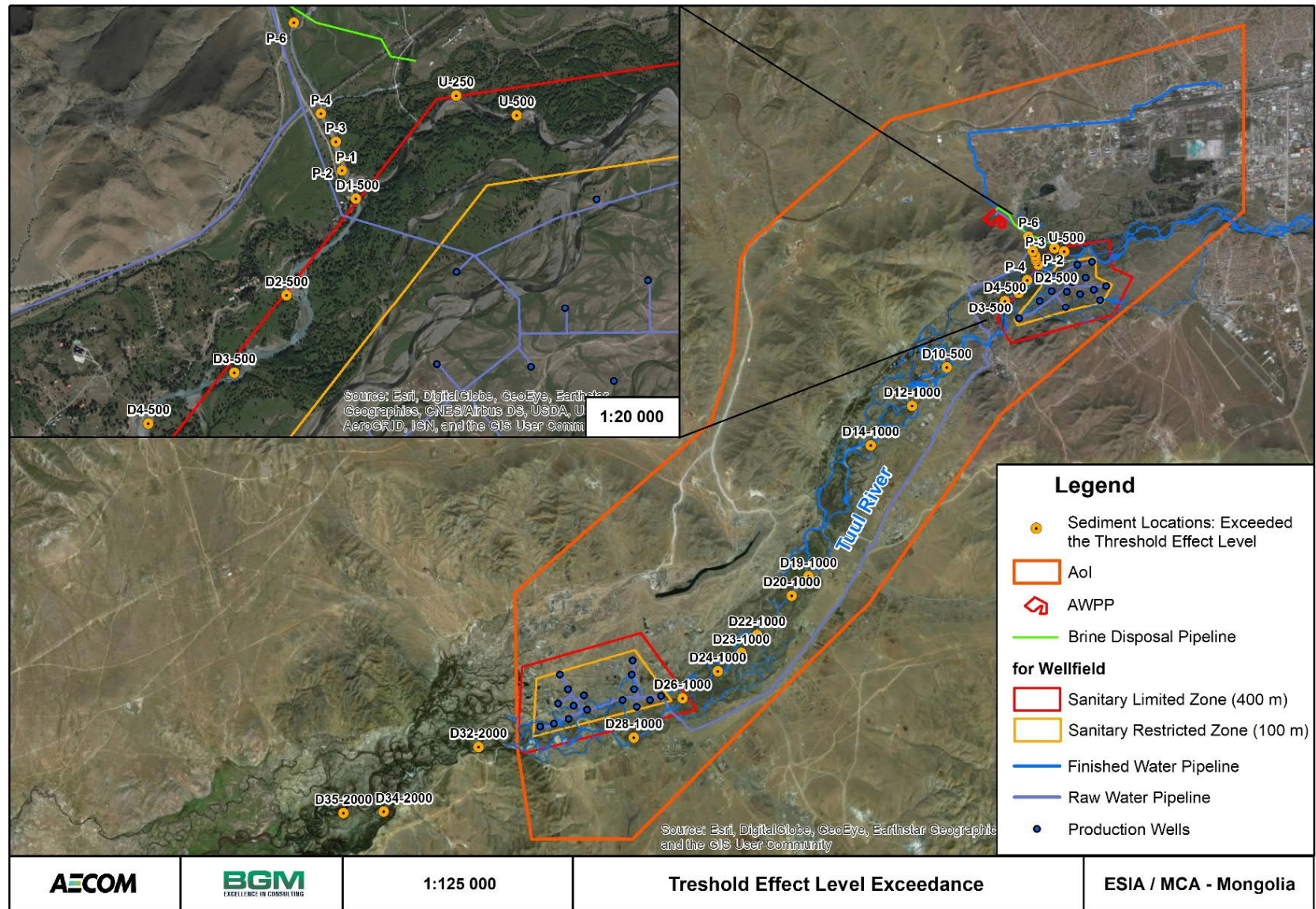
Evaluation of the metal concentrations in terms of the respective TELs and PELs reveals the following:

- Sediments with the highest concentrations of contaminants, including concentrations that exceed TELs and PELs, were mostly found at sites P-1 to P-4 on the previous CWWTP discharge side stream. Exceedances of the TELs or PELs for copper, nickel, zinc, arsenic, cadmium, lead, and chromium occurred along the side stream.
- Arsenic exceeded the TEL and chromium exceeded both the TEL and PEL at locations upstream of the current CWWTP effluent discharge point, at sites U-250 and U-500, and at site U-250, respectively. This indicates that Tuul River surface water and sediments have been contaminated by heavy metals from sources upstream of the CWWTP effluent discharge.
- Along the upstream portion of the primary 35-kilometer stretch of the river, relatively high concentrations were also obtained in the first 5 kilometers downstream of the CWWTP effluent discharge. This is exemplified by exceedances of the TELs for arsenic and chromium at site D1.500, the TEL and PEL for chromium at site D2.500, and the TEL for chromium at sites D3.500 and D4.500.
- Further downstream along primary stretch of the river, metal concentrations were lower than that for P-1 to P-4 locations, but comparably high concentrations were observed irregularly, notably at site D24.1000, where the TELs for zinc and arsenic, and the TEL and PEL for chromium were exceeded. These irregular high concentrations and exceedances indicate that metal accumulation along the riverbed is not directly correlated with distance from the CWWTP effluent discharge, or that additional point or non-point sources of metals are present downstream of the CWWTP.

Pollution accumulation is mostly regulated by river flow rates. As for metal concentrations, TP and TN concentrations also showed large spatial variations, with the highest concentrations at site P-1 to P-4, and irregular concentrations along the primary 35-kilometer stretch of the river. For site D24.1000, where TEL and PEL exceedances occurred as noted above, high TP and TN concentrations also were observed.

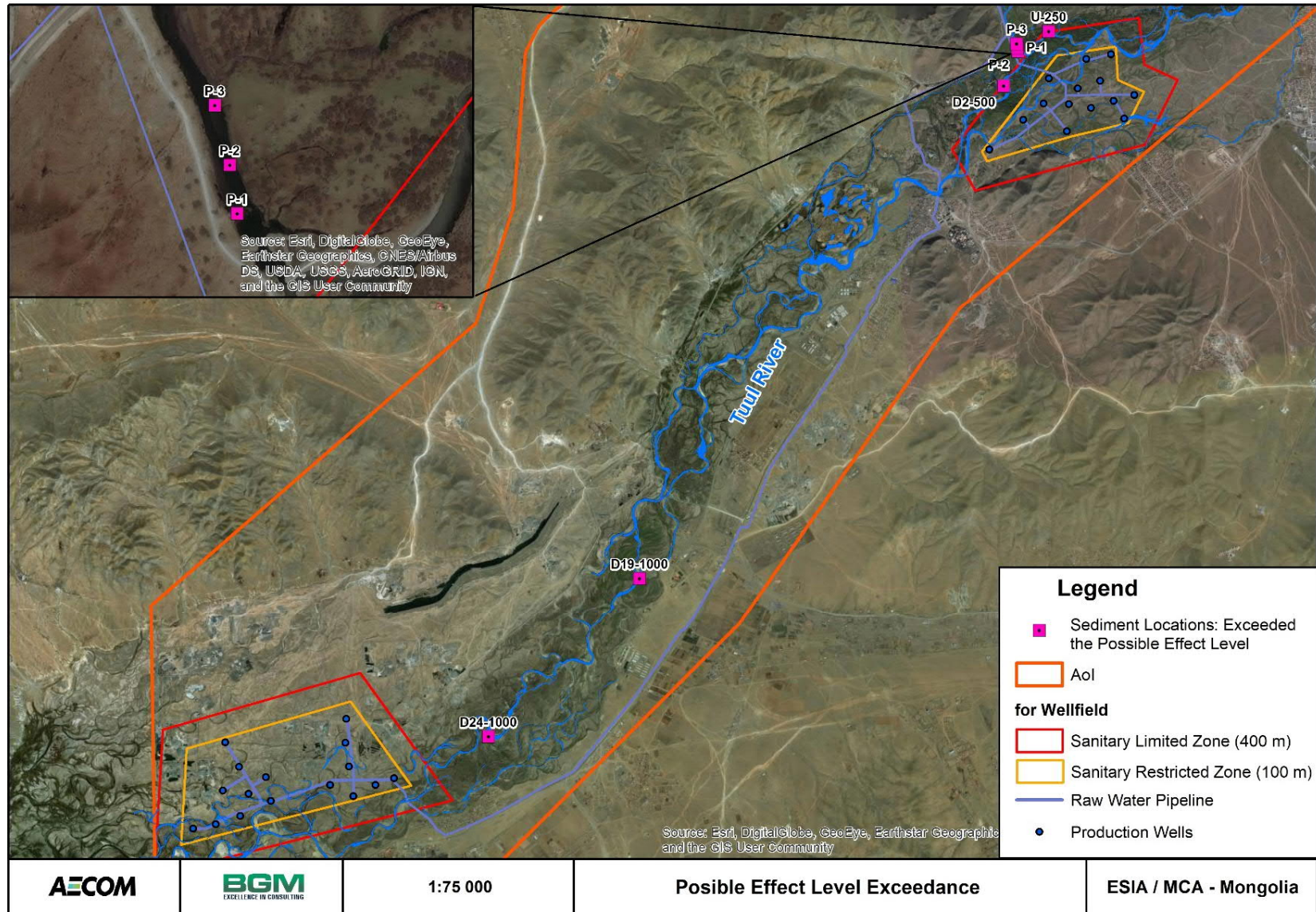
Planned improvements to the CWWTP would reduce future contamination, but this would not remedy contamination that has already occurred, including accumulation of metals in river sediments.





**Figure 6-72 Sampling Locations Exceeding the TEL**





**Figure 6-73 Sampling Locations Exceeding the PEL**

**Table 6-24 Metal Concentrations (milligrams per kilogram) Exceeding TELs and PELs**

Site	River width, meters	Sampling position at site	Cu	Ni	Zn	As	Cd	Pb	Cr
D1.500	42	Center	9.3	7.1	50	8	0.06	17.4	57
D2.500	28	Center	14.1	12.9	89	5	0.11	19.4	135
D3.500	28	Center	5.8	6.1	56	4	0.08	17.2	59
D4.500	77	Center	6	6.4	50	1	0.07	14.8	56
D10.500	36	Center	4.2	6.4	37	10	0.09	16.5	35
D12.1000	72	Center	7.7	8.3	47	4	0.06	18.1	52
D14.1000	58	Center	9.4	9.2	67	5	0.08	17.2	72
D19.1000	77	Center	8.6	7.9	80	5	0.09	17.5	93
D20.1000	47	Center	5.7	3.8	57	5	0.05	13.9	85
D21.1000	72	Center	3	4.2	32	8	0.03	15.5	28
D22.1000	69	Center	8.5	8.6	58	6	0.08	17.5	88
D23.1000	45	Center	9.8	10.3	66	10	0.09	18.6	75
D24.1000	42	Center	25.5	12.7	197	15	0.25	23.1	363
D26.1000	40	Center	1.8	3.9	22	10	0.02	14.7	13
D27.1000	52	Center	2.8	7.8	32	7	0.03	14.6	37
D28.1000	50	Center	6.4	7.6	50	9	0.08	17.8	46
D32.2000	39	Center	0.9	3.6	23	10	<0.02	16.9	8
D34.2000	43	Center	7.9	9.3	70	10	0.09	20.1	70
D35.2000	39	Center	3.4	5.1	37	4	0.04	15.7	48
D.Lun	78	Center	5.2	4.6	27	8	0.03	16.4	8
U-250	39	Center	13.8	11.5	94	11	0.15	19.2	130
U-500	20	Center	1.9	5.2	20	8	0.02	15.7	8
P-1	32	Center	56.2	17.1	402	14	0.51	37.9	844
P-2	34	Center	67.1	22	546	19	0.73	46.5	876
P-3	32	Center	47.5	20.7	313	14	0.6	40.7	633
P-4	32	Center	0.8	4.6	21	10	0.03	15.7	10
P-6	12	Center	5.1	6.4	43	3	0.09	16.1	56
TEL			36	18	123	7.2	0.596	35	37
PEL			197	36	315	41.6	3	91	90

Notes: Orange shading indicates exceedance of threshold effect level (TEL); Red shading indicates exceedance of possible effect level (PEL).

#### 6.1.9.5.2 Sludge Depth and Volume

In most core samples, a black layer could be visually identified and measured. The black layer indicates organic content. Part of the black layer appeared to be almost completely organic material consistent with sludge, while part was primarily silty, sandy, and/or gravelly sediment with some organic content. The black layer in each core sample could be readily distinguished from other layers in the samples by its color and consistency.

The average sludge thicknesses by transect are illustrated in Figure 6-74 and Figure 6-75 for sampling locations upstream of the CWWTP effluent discharge and along the primary 35-kilometer stretch of the Tuul River, and for sites P-1 to P-6 along the side stream downstream of

the previous effluent discharge, respectively. Figure 6-74 clearly shows that there is no sludge accumulated upstream of the CWWTP effluent discharge point at sites U-100 to U-500. The figure also shows a general, but discontinuous downward trend in average thickness of accumulated sludge beginning at the effluent discharge (between sites U-100 and D1.500) and proceeding in a downstream direction.

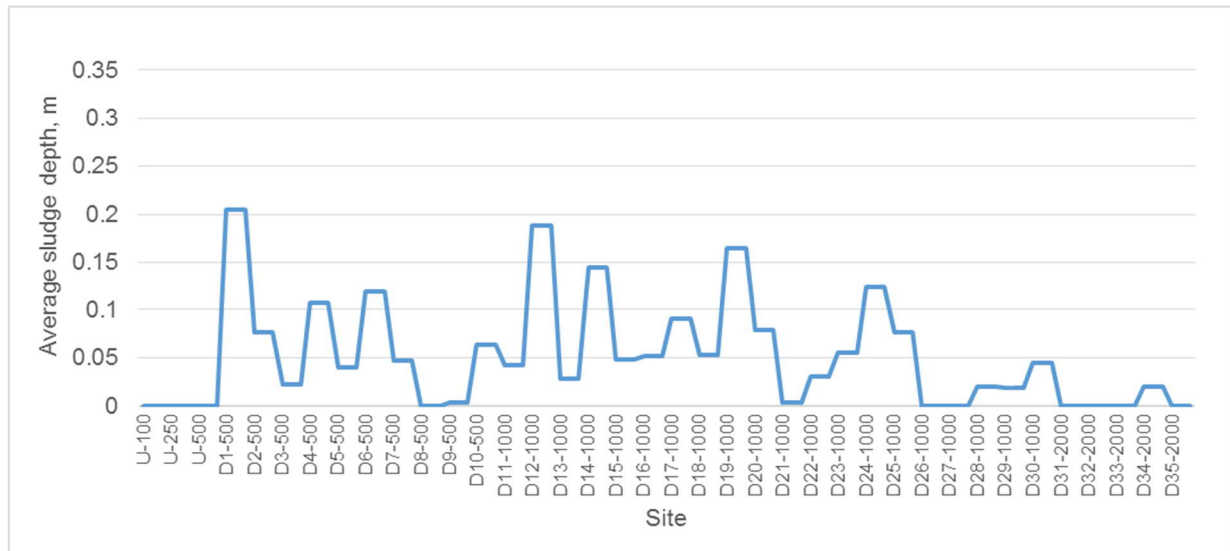


Figure 6-74 Average Sludge Depth between Sites U-500 and D35.2000

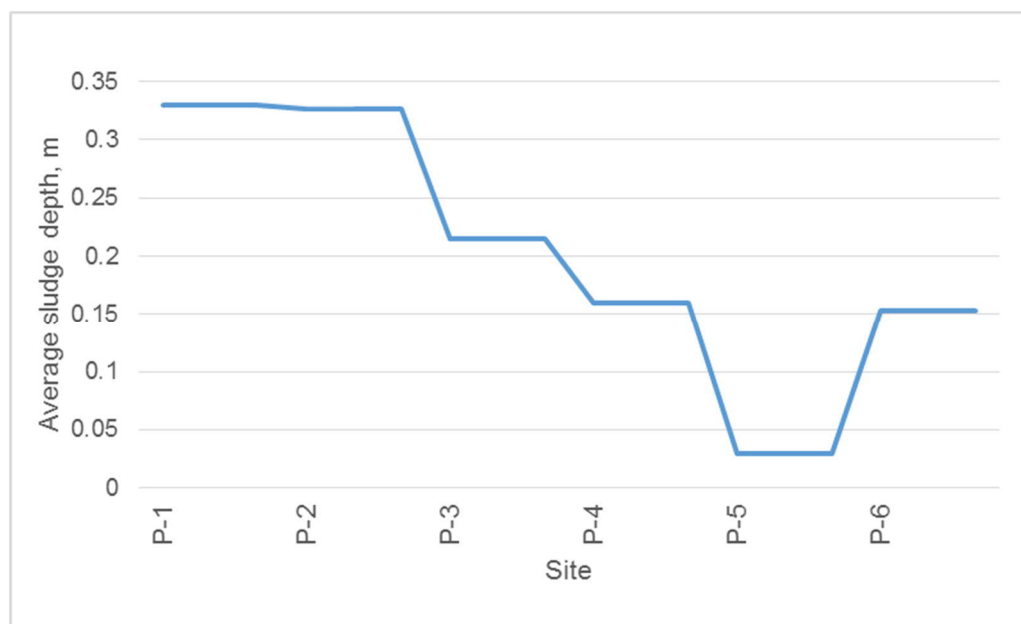


Figure 6-75 Average Sludge Depth between Sites P-1 and P-6

The river width was measured at each transect. The core sampling points were located at 20 percent of river width from the left bank, at the center the river (or 50 percent of river width), and at 20 percent of river width from the right bank. The side stream width also was measured at each transect, and core sampling points were located in the same way. Exact sampling locations were based on river measurements made in the field.

Based on the locations of core sampling points, the volume of sludge was calculated between each transect and averaged along the river or side stream length. Sludge volume was calculated using the geometric dimensions of the river and the measured thickness of the black layer, based on visual determinations of core samples, and using volatile solids quantities. There was no accumulated sludge at some locations along the selected transects, and along the lengths of the



Tuul River and side stream (see Figure 6-74 and Figure 6-75). Further, analysis of the sludge depth data determined that the distribution of contaminated sediment also varies across the width of the Tuul River, with accumulated sludge on average being roughly twice as thick along the riverbanks as along the river centerline between sites D1.500 and D30.1000.

Sludge layer depth, as indicated by the black layer depth, was calculated for two different sections: (1) the river between the CWWTP discharge point and site D35.2000, and (2) the side stream near the previous discharge point between sites P-1 and P-6. The corresponding river section lengths were 35 kilometers and 900 meters, respectively. For the two sections, the estimated volume of sludge deposited on the river or stream bed was calculated both (a) excluding the part of the black layer that is primarily sand and gravel, and (b) based on the volatile solids, including the part of the black layer that is primarily sand and gravel. The findings of the analysis are summarized as follows:

#### **Excluding Primarily Sand and Gravel Layer**

- The average sludge layer depth was 6.3 centimeters for the river and 20.3 centimeters for the side stream where the previous CWWTP discharge was located.
- The sludge volume deposited on the bed is calculated as approximately 95,000 cubic meters for the river downstream of the current discharge point, and approximately 5,500 cubic meters downstream of the previous discharge point. The estimated total volume of sludge is approximately 100,500 cubic meters.

#### **Including Primarily Sand and Gravel Layer**

- The average sludge layer depth is 12.6 centimeters for the river and 21.7 centimeters for the side stream where the previous CWWTP discharge was located.
- Based on the volatile solids, the sludge volume deposited on the bed is calculated as approximately 203,100 cubic meters for the river downstream of the current discharge point, and approximately 5,700 cubic meters downstream of the previous discharge point. The estimated total volume of sludge using this approach is approximately 208,800 cubic meters.

The presence of high concentrations of specific contaminants in sludges at specific locations where historic or current wastewater discharges occur strongly suggests that these discharges contribute or have contributed to the contamination detected by the river sediment sampling. The presence of the contaminants also comprises a potential risk to both surface water and groundwater quality.

#### **6.1.9.5.3 Enrichment Factor of Sludge Pollution**

The crustal enrichment factor (EF) is commonly used to estimate anthropogenic inputs of metals. According to the method, metal concentrations are normalized to the metal concentrations of average shale or the average of the earth's crust. The EF was calculated using the following equation:

$$EF = (C_{Me}/C_{ref})_{sediment} / (C_{Me}/C_{ref})_{crust}$$

where,  $(C_{Me}/C_{ref})$  sample and  $(C_{Me}/C_{ref})$  background represent the metal to reference element ratios in the samples and in the upper continental crust, respectively.

To identify potential anomalous metal concentrations, Al was used as the normalizing element.

- $EF < 1$  indicates no enrichment,
- $EF < 3$  is minor enrichment,

- EF = 3–5 is moderate enrichment,
- EF = 5–10 is moderately severe enrichment,
- EF = 10–25 is severe enrichment,
- EF = 25–50 is very severe enrichment,
- EF > 50 is extremely severe enrichment.

The calculated EF values for each metal in Tuul River sediment are illustrated by box plot graphs in Figure 6-76. The background values for Tuul River sediments upstream, or for local soils, are not available for the metals. The upper continental crust average values are used for the EF calculation. Local background concentrations, if known, could change the EF values.

The degree of metals pollution appears in the following order:

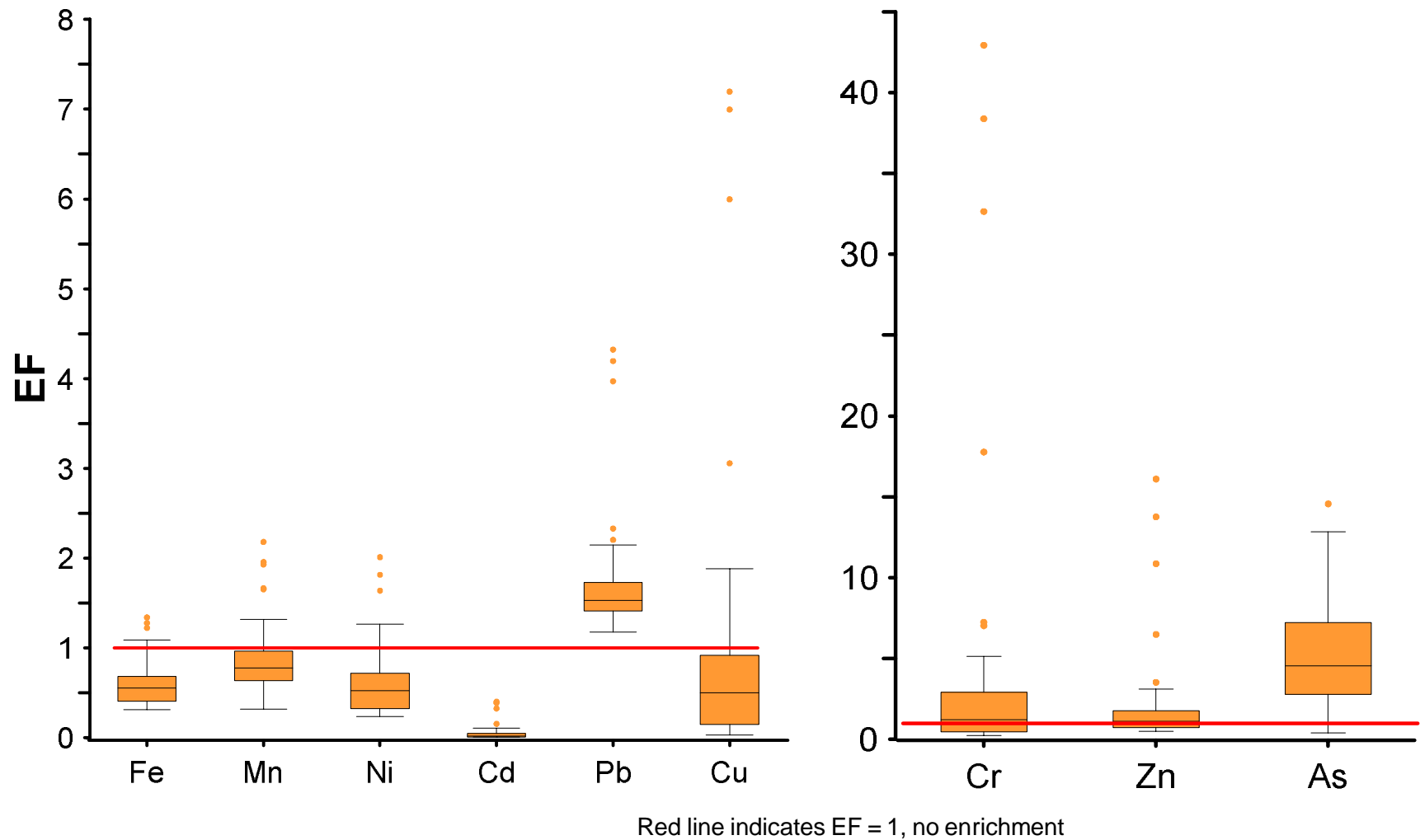
$$\text{Cr} > \text{Zn} > \text{As} > \text{Cu} \approx \text{Pb} > \text{Mn} > \text{Ni} > \text{Cd} > \text{Fe}$$

From Figure 6-76, some sites have higher EF values for Cr, Zn and As, as much as > 10 or > 25, severe to very severe enrichment. Where sediments readily accumulate (areas such as lee bend or river braids with low velocity) the metals concentrations could be higher.

Additionally, CWWTP effluent, with high levels of biological and chemical contaminants entrained, discharges into the main channel of the Tuul River upstream and northwest of the proposed Biokombinat wellfield site. The year-round discharges of effluent from the CWWTP cause low dissolved oxygen concentrations downstream from the plant outfall. The waste from the plant contains high amounts of nutrients and other chemical substances that cause major reductions of dissolved oxygen, which in turn would kill aquatic fauna in the affected reach of the river (Altansukh and Davaa, 2011; Altansukh et al., 2012).

Samples taken at effluent, at contaminated Tuul River flow, and at the wells drilled nearby to these areas showed a detection of coliforms, bacteria, and pathogens repeatedly. This indicates direct relationship of the contamination due to interaction of Tuul River surface water and groundwater in Aol. To conclude, after improvement in the treatment processes of the CWWTP, the contamination level will significantly decrease.





**Figure 6-76 Crustal Enrichment Factors of Metals in Tuul River Sediment (Red line is threshold value for enrichment)**

## 6.1.10 Natural Hazards

Mongolia is vulnerable to several major natural hazards including blizzards, heavy snow, dust storms, dzuds<sup>41</sup>, floods, hail, wildfire, drought, and desertification. Lightning and locust infestations are listed as minor hazards in the country.

MET also considers plague, epidemic disease, and ecological hazards minor natural hazards in Mongolia (Ministry of Nature and Environment, 2003). The country is prone to earthquakes and has experienced several larger earthquakes in recent decades (Klyucheyevskii et al., 2007). In UB, population density and the quality of the construction and design of buildings and structures are two factors that impact the city's vulnerability to earthquakes (Dorjpalam et al., 2004).

Disasters impacting UB include flash floods, earthquakes, and wildfires. National and local agencies report that over 2,000 households of six districts in the city have settled in an area of flood risk. Flood risk has increased in UB due to factors including: the frequency of flood events, climate change, increasing population, centralization and urbanization, and inadequacy of flood protection structures and systems. Downhill floods associated with rain events are a particular threat in the city. The Tuul, Selbe, and Ulistai Rivers have been identified as hot spots for flooding. Over 130 kilometers of flood protection facilities have been constructed in the city since the 1960s<sup>42</sup>.

As mentioned in Section 1.1, BWSE would develop two wellfields in the vicinity of Biokombinat and Shuvuun, downstream of UB. During the hydrogeological investigation, surface and groundwater levels were monitored for a period of 40 days (August 4 to September 23, 2019) at Shuvuun and 18 days (July 7 to 25, 2019) at the Biokombinat wellfield sites. Due to the heavy rains at the end of July, the flow in the Tuul River increased sharply, causing it to flood at the Biokombinat wellfield site and limiting access until the end of August.

For the Shuvuun wellfield, the rainy days in early August caused the water level in the river and aquifer to rise 35-40 centimeters. The water level declined significantly after August 15, before returning to its original water level on August 18. The levels in the river and the aquifer continued to decline slowly due to generally dry weather, and by the September 18-19 the river level had declined as much as 40-45 centimeters in certain locations.

### 6.1.10.1 Effects of Atmosphere Related Phenomena

Mongolia has experienced impacts of climate change and related global warming in recent years (Byambakhuu et al, 2016, MET, 2018a). One such impact is an increase of extreme weather-related events; exceptional both in scale and frequency. Such weather events include strong winds, thunderstorms, major floods, tornados, blizzards, and heat waves. According to observational data since 1990, 37 strong wind days were recorded in 2005 (Municipality of Ulaanbaatar, 2018). Table 6-25 illustrates the total number of days with weather related phenomena observed around Buyant-Ukhaa Station, divided between 1975-1995 and 1996-2015.

As shown in Table 6-25, between the two time periods, the number of days with snowstorms increased by 10 days, and dust storm by 12 days, respectively. Twenty-nine of these events occurred only in the springtime, with maximum wind speeds of 30 meters per second. Global

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<sup>41</sup> A dzud (or zud) is a phenomenon in which summer drought followed by severe winter weather causes large numbers of livestock fatalities due to a lack of fodder and/or cold temperatures.

<sup>42</sup> [https://www.gfdrr.org/sites/gfdrr/files/%28SESSION\\_4%29\\_Dondmaa\\_Enebish\\_%28Mongolia%29.pdf](https://www.gfdrr.org/sites/gfdrr/files/%28SESSION_4%29_Dondmaa_Enebish_%28Mongolia%29.pdf)

warming and related heat waves result in more frequent lightning and days heavy rain; the latter having increased by 10 days in recent years (MET, 2018a).

**Table 6-25 Number of Days with Phenomena**

Phenomena	Number of incidents, days		Phenomena	Number of incidents, days	
	1975-1995	1996-2015		1975-1995	1996-2015
Number of snowstorm days*	1	11	Number of days with heavy rain*	25	35
Number of snowy days*	7	8	Number of days with hail*	2	2
Number of dust storm days*	15	27	Number of days with lightning*	18	24
*GoM resolution 286, Appendix 2: <u>snowstorm days</u> : when the average wind speed is 10 m / s or more, a snowstorm will occur and the visual distance will be less than 2000 m; <u>snowy days</u> : 5 mm or more; <u>dust storm days</u> : visual distance will be less than 1000 m or less; <u>heavy rain days</u> : 30 mm or more; <u>hail days</u> : up to 10 mm in diameter;					

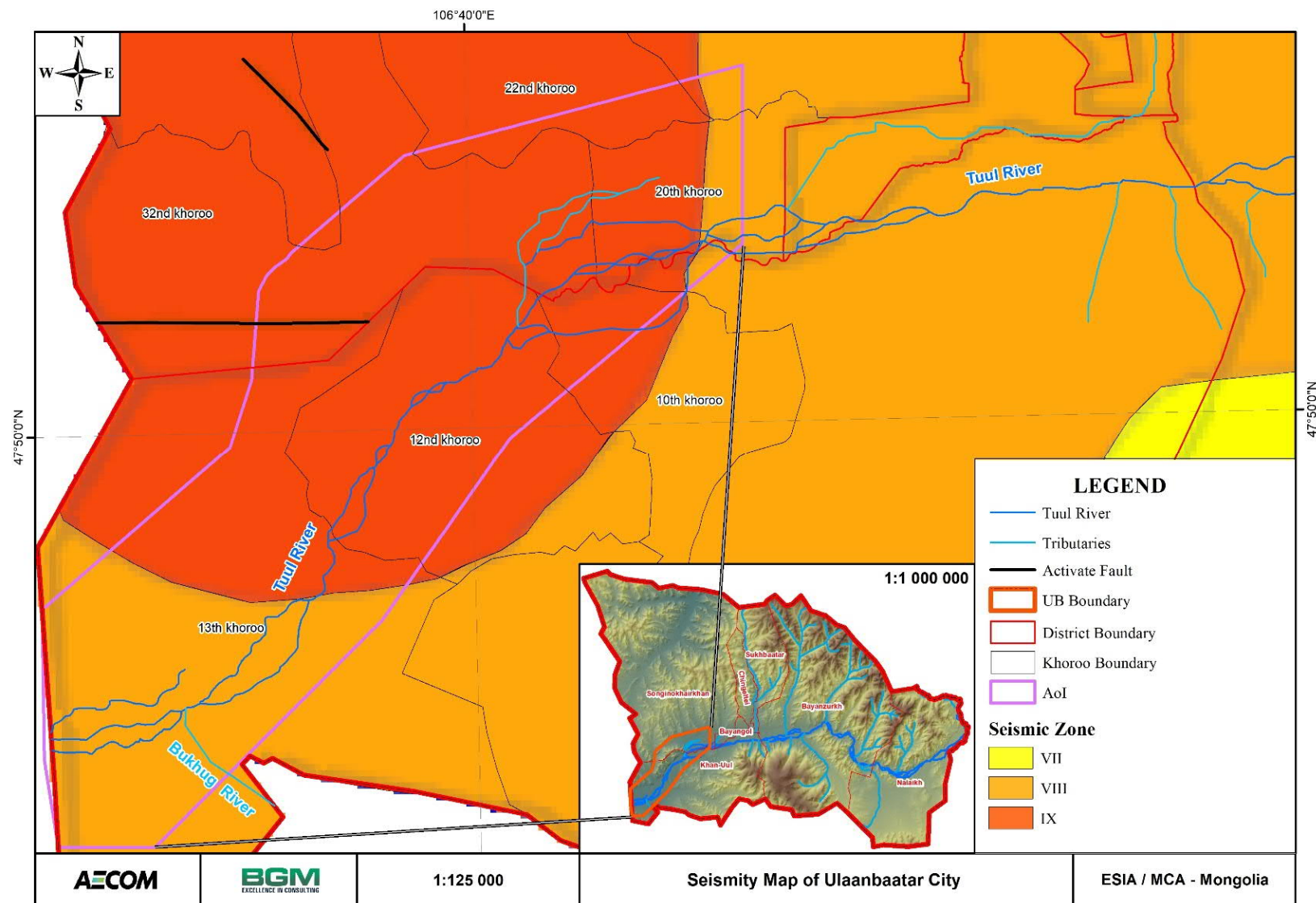
### 6.1.10.2 Seismic Characteristics and Geo-Physical Risk Areas

Much of Mongolia lies within areas of the Central-Asian seismic belt and the country is prone to frequent and large earthquakes. In the 1990s, over 60 earthquakes occurred in Mongolia, resulting in severe destruction of the landscape. Three of these earthquakes left seismotectonic deformations up to several hundred kilometers in length (Klyuchevskii et al., 2007). The Research Center for Astronomy and Geophysics at the Academy of Sciences and the National Emergency Research has shown that earthquakes with a magnitude of greater than 7.0 may be generated in UB and the surrounding region, which overlies the Gunzhin Fault in the southern Hentiyn arched uplift of central Mongolia and extends northeast of UB (Imaev et al., 2012).

There are three active fault zones within the vicinity of UB: the Hustai, Emeelt, and Gunjiin faults. The Hustai and Emeelt faults are located east and south of UB. The Husai fault is over 80 kilometers in length and extends in an arc shape to the north of the Tuul River. The Emeelt fault extends in a northwest to southeast line perpendicular to the Hustai fault. The Gunjiin fault lies to the east of UB and in a northeast to southwest direction (Demberel et al., 2014).

According to recent studies on seismic activities and seismic risk assessments, and as shown in Figure 6-77, the Aol belongs to the category of active seismic activity zone with moderate probability of earthquakes of magnitude 8 to 9 on the Richter scale<sup>43</sup>.

<sup>43</sup> <https://geoportal.nsdi.gov.mn/alagac/home/>.



**Figure 6-77 Seismic Risk Zoning Map of UB**

### 6.1.11 Ecosystem Services

The BWSE project is located in the downstream part of UB city, and the BWSE AoI encompasses in part Khan-Uul and Songinokhairkhan districts in UB and the USUG water supply service area.

Nonetheless, the Upper Tuul River Valley is a critical ecosystem that provides services<sup>44</sup> such as drinking water (provisioning services), domestic and international tourism (cultural services), and air and water purification (regulating services). Thus, the health of the Tuul River ecosystem and eco-hydrological processes have major significance for UB city's centralized and non-centralized drinking water supply system (Byambakhuu et al., 2016).

The AoI is characterized by common type of mountain-steppe ecosystems, meadow-steppe and floodplain meadow types of unique ecosystem found along the Tuul River Basin (see Figure 6-78, Figure 6-79, and Figure 6-80). The ecosystems of the AoI have been significantly affected by intensive urbanization, livestock grazing for proposed Shuvuun and Biokombinat wellfields and gravel mining activities at Shuvuun wellfield.



**Figure 6-78 Mountain Steppe Ecosystem**



**Figure 6-79 Tuul River Riparian Ecosystem**

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<sup>44</sup> Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services (IFC, PS 6, 2012).





**Figure 6-80 Meadow-like Grassland Ecosystem**

The Tuul River Valley also provides supporting ecosystem services, such as nutrient and water cycles, which are essential for the functioning of natural processes. Near the headwaters of the Tuul River, the water is cold and typically free flowing. The substrate is gravel and stone, and vegetation shields the river from sunlight. However, downstream, from Tuul-Songolon to Tuul-Altan-Bulag, to Tuul-Lun, the river contains organic pulp and silt. Here, the river is dominated by pollution-tolerant species.

Maintaining the integrity of the Tuul River ecosystem is necessary to foster the protection of watershed services, which support biodiversity, human health and wellbeing, as well as economic development.

The Upper Tuul River Valley provides valuable services including grazing land (170,000 hectares per year), firewood (8,500 cubic meters per year), timber (3,300 cubic meters per year), fruits, berries, wild vegetables, pine nuts, and medicinal plants (20,000 kilograms per year), and clean water for drinking, cooking, cleaning, and commercial and industrial activities (Emerton et al., 2009; Almack and Chatreaus, 2010). In the Upper Tuul River Basin, development and deforestation associated with pasture and timber production have impacted the water supply and the ability of the aquifer to recharge (Emerton et al., 2009; Almack and Chatreaus, 2010).

Desertification<sup>45</sup> is a threat to both the natural and economic capacity of the Tuul River Basin due to decreased ecosystem productivity (MEGD, 2012). Approximately 57 percent of the total area of the Tuul River Basin has been impacted by desertification. Much of the heavily degraded area exists in the vicinity of UB (MEGD, 2012).

Deforestation, overgrazing, and conversion of land to agriculture also impact soil quality and have led to erosion from wind and rain. MEGD (2014) reported that, in recent years in Mongolia, approximately 550 rivers and 450 lakes have dried up, 75 percent of the pastureland has been degraded, and 1.5 million hectares have been deforested, resulting in significant impacts to life-sustaining ecosystem services. If degradation continues, the estimated economic impacts associated with loss of ecosystem services in the Upper Tuul River Valley alone have been estimated at between \$338 million and \$528 million over the 25 years starting in 2009 (Emerton et al., 2009; Almack and Chatreaus, 2010).

Depth of water, river width, stream flow, and overflows are dependent on water level (Davaa and Tsengel, 2010). Water temperature is a main factor for living aquatic organisms and their growth. Species complexity, fish populations, and the population of other aquatic organisms decline when water levels decrease; whereas, decreasing water levels provide a favorable environment for algae and some heat-resistant species (Davaa, 2015). Many fish migrate seasonally to other

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<sup>45</sup> As defined by the United Nations Convention to Combat Desertification, desertification is the land degradation in arid, semi-arid, and dry sub-humid areas as resulting from various factors, including climate variations and human activities.

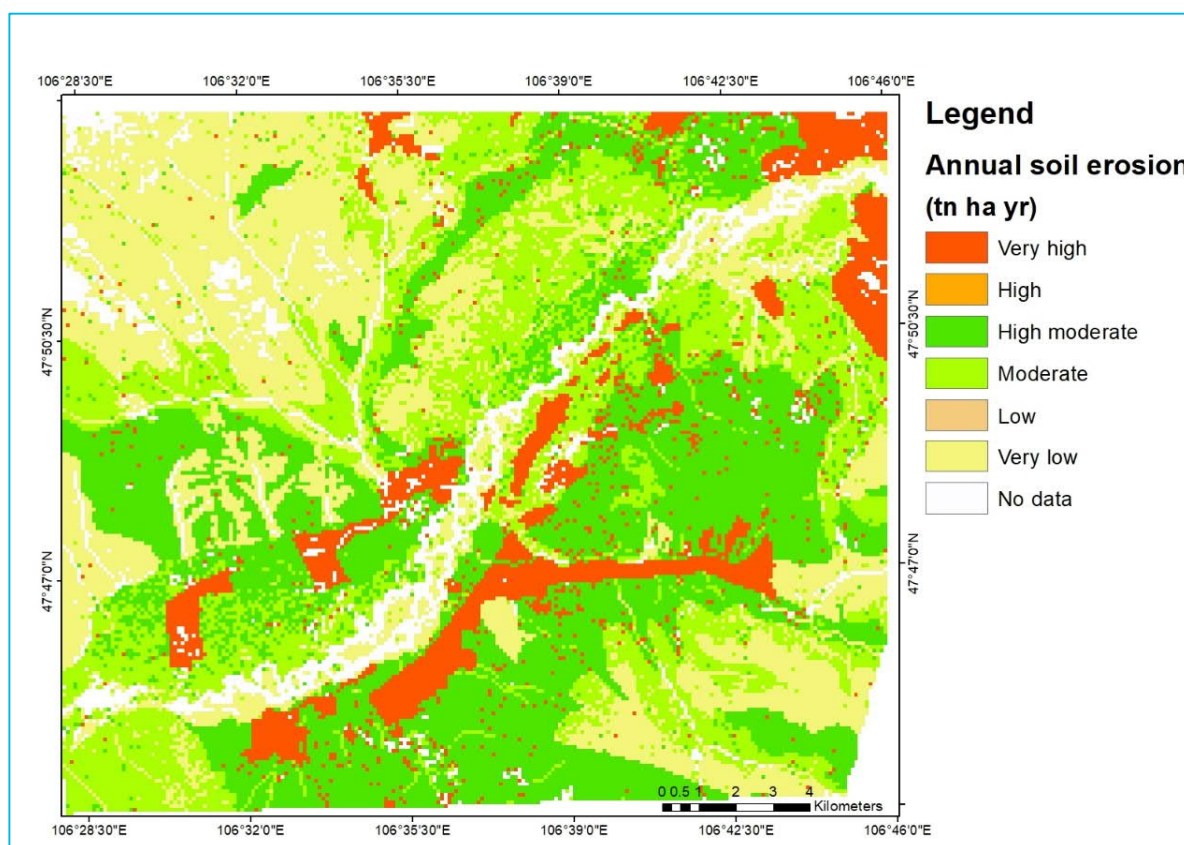
areas in response to declines in food sources, such as invertebrate populations, associated with low flow conditions.

Land degradation and soil erosion are common problems in terms of environmental quality. Recently, migration to UB city has strongly affected environment quality and land use. Additionally, the Tuul River has been subjected to anthropogenic impacts resulting from human activities, such as construction, gravel mining, and outdoor recreation.

Soil erosion mainly comprises anthropogenic and water induced gully and sheet erosion. The intensity of erosion varies widely, both spatially and temporally, depending on micro-climatic and landform factors.

The Shuvuun area is one of the main areas of gravel mining and cultivation of UB city. Around Shuvuun, gravel mining started in 1960 to support factory construction. Mammals and birds in this area migrate seasonally to other areas in response to mining related declines in food sources, such as reduced vegetation productivity due to land degradation resulting from these and other human activities.

For the AoI, annual soil erosion rates were estimated based on Revised Universal Soil Loss Equation empirical modelling. The equation predicts long-term, average annual erosion by water for a broad range of farming, conservation, mining, construction, and forestry uses. As shown in Figure 6-81, the estimated annual soil erosion rate in the AoI is -0.16 to 4.30 tons per hectare per year. The most degraded and highly eroded areas are cultivated land and mining areas.



**Figure 6-81 Potential Soil Erosion in AoI**

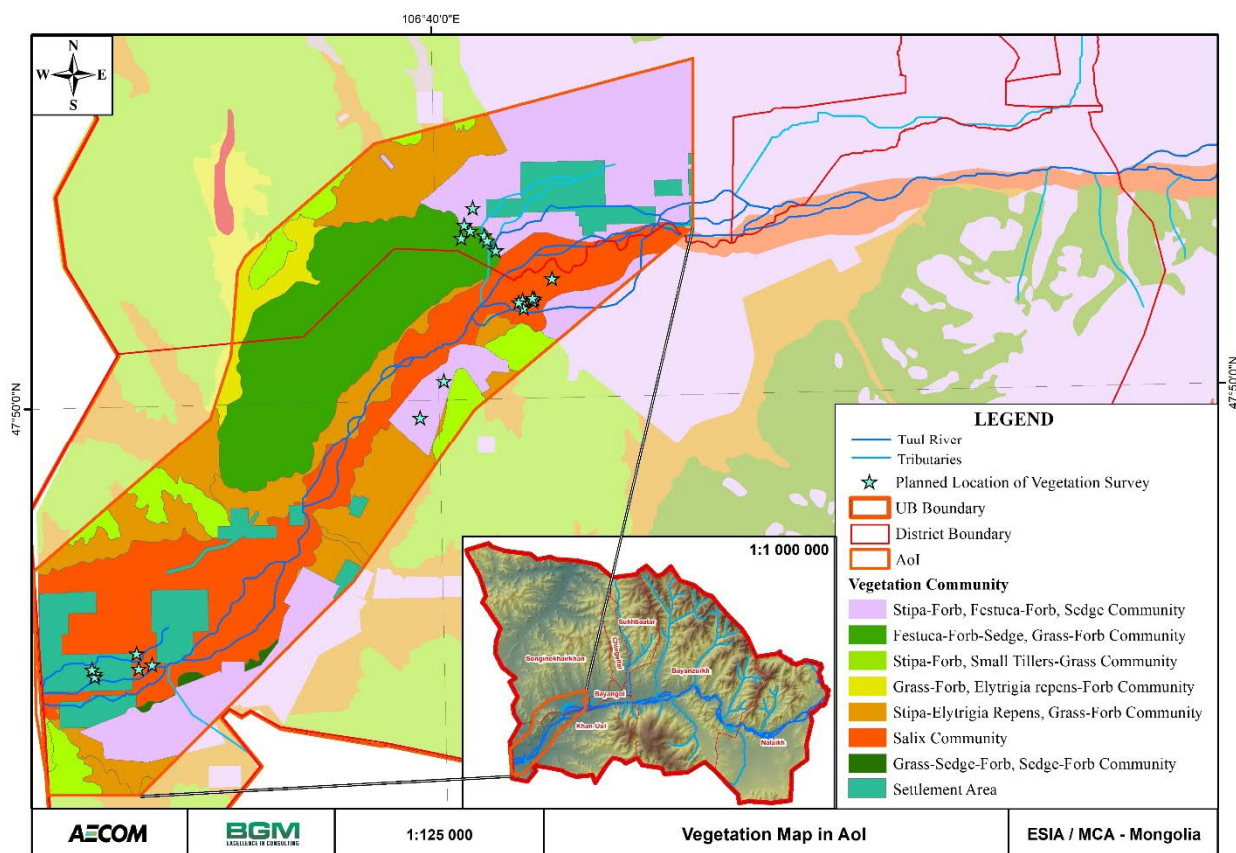
## 6.1.12 Flora

Mountain forest steppe vegetation (29.5 percent) and steppe and dry steppe vegetation (21.9 percent) comprise over half of the vegetated area in the Tuul River Basin. Other prevalent

vegetation types include non-pasture, desert steppe, high mountain, and mountain steppe, which cumulatively comprise approximately 44.0 percent of the vegetated area (MEGD, 2012).

Most of the forested area of the basin is found in the Khan Khentii Protected Area and Gorkhi-Terelj Natural Area, as well as the Batkhaan and Khustain Nuruu Special Protected Area (MEGD, 2012). Loss of forest land since the 1940s has adversely impacted the balance of the river flow regime and annual flow volume (MEGD, 2012).

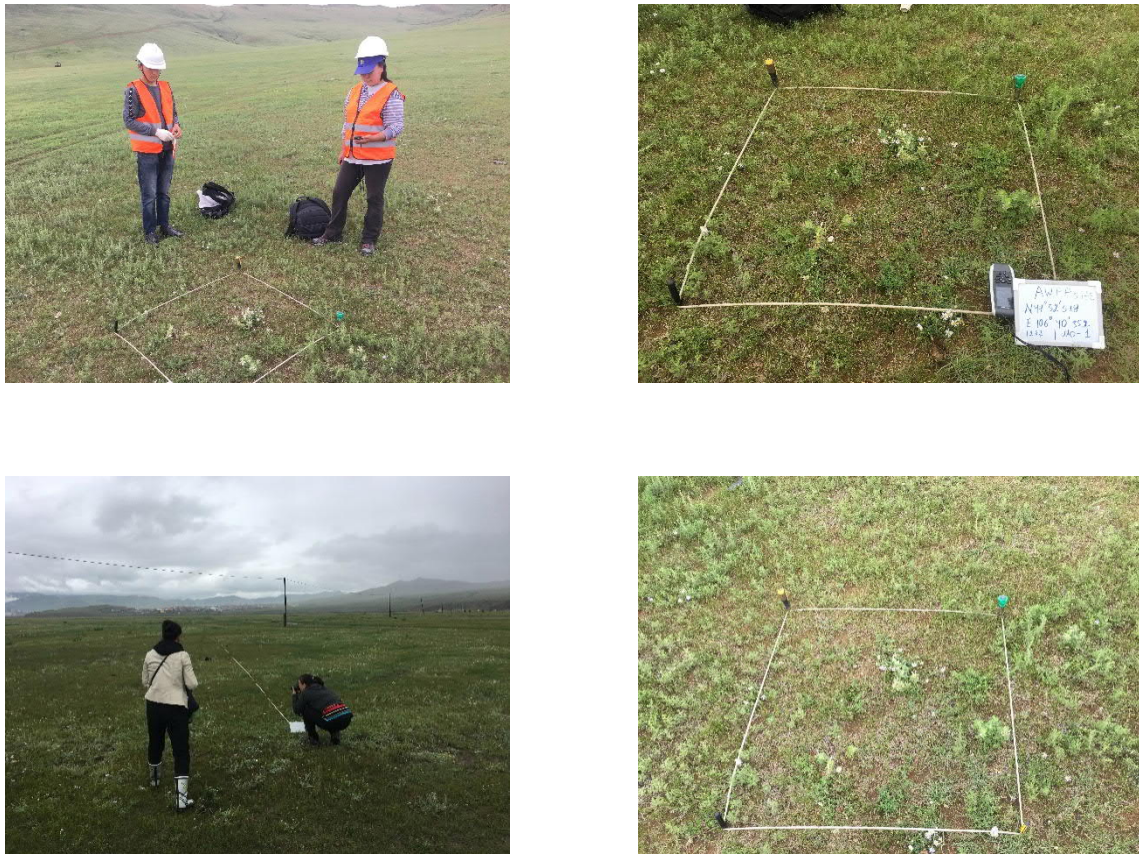
Geographical distribution of vegetation covers in the downstream vicinity of UB city, where the BWSE project would be implemented, is shown in Figure 6-82. Locations of vegetation survey were carefully identified to be representative of each type of vegetation cover in the overall Aol with 17,898 hectares.



**Figure 6-82 Vegetation Field Survey at Aol**

Mountain forest steppe vegetation, steppe vegetation, and dry steppe vegetation are present within the areas of the proposed Biokombinat and Shuvuun wellfields, the AWPP, and conveyance pipelines. As shown in Figure 6-83, within the Aol, a field survey was performed during the period from July 20 to August 6, 2019, and photo-monitoring data and samples were collected in 22 survey locations (Table 6-26 and Figure 6-84).





**Figure 6-83 Vegetation Field Survey at Aol**

These selected locations for vegetation survey were judged representative of the vegetation cover types prevalent within the areas that potentially would be impacted by each of the major project components.

Surveying the vegetation involved the following activities:

- Identify the types of vegetation within the Aol and develop a vegetation cover map
- Survey of the dominant vegetation communities and determine the extent of the vegetation cover, bare land, grass, and rocks
- Record species abundance and identify very rare, rare, endemic, and relict plants
- Record medicinal plants, pasture plants, and weed species, and hence identify the source of hay and fodder stocks

The following methods were used for the study:

- **Species composition and richness:** At each survey location, a 100-square-meter (10-meter by 10-meter) study plot was delimited and the corners of the plot were marked. The plant species composition and flora richness of each plot were determined in accordance with *Conspectus of the Vascular Plants of Mongolia* (Urgamal et al., 2014), *Key to the Vascular Plants of Mongolia* (Grubov, 1982), and The Angiosperm Phylogeny Group classification for the orders and families of flowering plants (Angiosperm Phylogeny Group, 2009).
- **Cover:** Vegetation cover was determined based on photo-monitoring measurement with 5 replicates along a distance of 25 meters.
- **Yield:** Yield was evaluated as the average yield at five replicate, 1-square-meter sampling points at each survey location based on wet and dried weights of samples.

Table 6-26 Vegetation Survey Locations

No	Longitude	Latitude	Elevation Above Sea Level (meters)	Location
1	106 40 35.2	47 52 31.8	1287	AWPP
2	106 40 55.8	47 53 01.7	1261	AWPP
3	106 40 42.2	47 52 48.2	1292	AWPP
4	106 40 49.8	47 52 42.9	1304	AWPP
5	106 41 10.5	47 52 37.6	1259	AWPP
6	106 41 13.7	47 52 33.6	1249	pipelines
7	106 41 26.0	47 52 23.3	1241	pipelines
8	106 42 04.5	47 51 27.9	1236	Biokombinat
9	106 42 03.7	47 51 33.6	1243	Biokombinat
10	106 41 58.2	47 51 33.4	1237	Biokombinat
11	106 42 16.7	47 51 33.6	1238	Biokombinat
12	106 42 19.9	47 51 36.2	1236	Biokombinat
13	106 42 46.0	47 51 55.1	1246	Biokombinat
14	106 42 19.9	47 51 36.2	1250	Biokombinat
15	106 40 08.9	47 50 18.7	1236	pipelines
16	106 39 33.1	47 49 43.3	1233	pipelines
17	106 33 02.9	47 45 49.8	1203	Shuvuun
18	106 32 43.5	47 45 46.6	1203	Shuvuun
19	106 32 41.4	47 46 01.3	1205	Shuvuun
20	106 31 41.3	47 45 43.0	1201	Shuvuun
21	106 31 41.0	47 45 40.6	1198	Shuvuun
22	106 31 36.9	47 45 48.2	1199	Shuvuun

The findings of the field survey show that the following are the dominant vegetation communities in the study area (see Figure 6-84):

#### Proposed Biokombinat Wellfield Area

- Couch grass (*Elytrigia repens*)-grass-sedge-forb-fringed sagebrush (*Artemisia frigida*)
- Grass-sedge-forb
- Grass-sedge-forb- fringed sagebrush (*Artemisia frigida*)Small sedge
- Sedge-grass-Adamsii's sagebrush (*Artemisia adamsii*)
- Grass-forb- fringed sagebrush (*Artemisia frigida*)

#### Proposed Shuvuun Wellfield Area

- Couch grass (*Elytrigia repens*)-grass-sedge-*Artemisia* sp.
- Grass-small sedge
- Sedge-grass-forb with *Salix* sp.

#### Proposed AWPP Site

- Forb-grass-sedge-*Artemisia* sp.



- Couch grass (*Elytrigia repens*)-sedge-forb
- Small tillers grass-forb- fringed sagebrush (*Artemisia frigida*)
- Iris lacteal
- Sedge- couch grass (*Elytrigia repens*)- Adamsii's sagebrush (*Artemisia adamsii*)

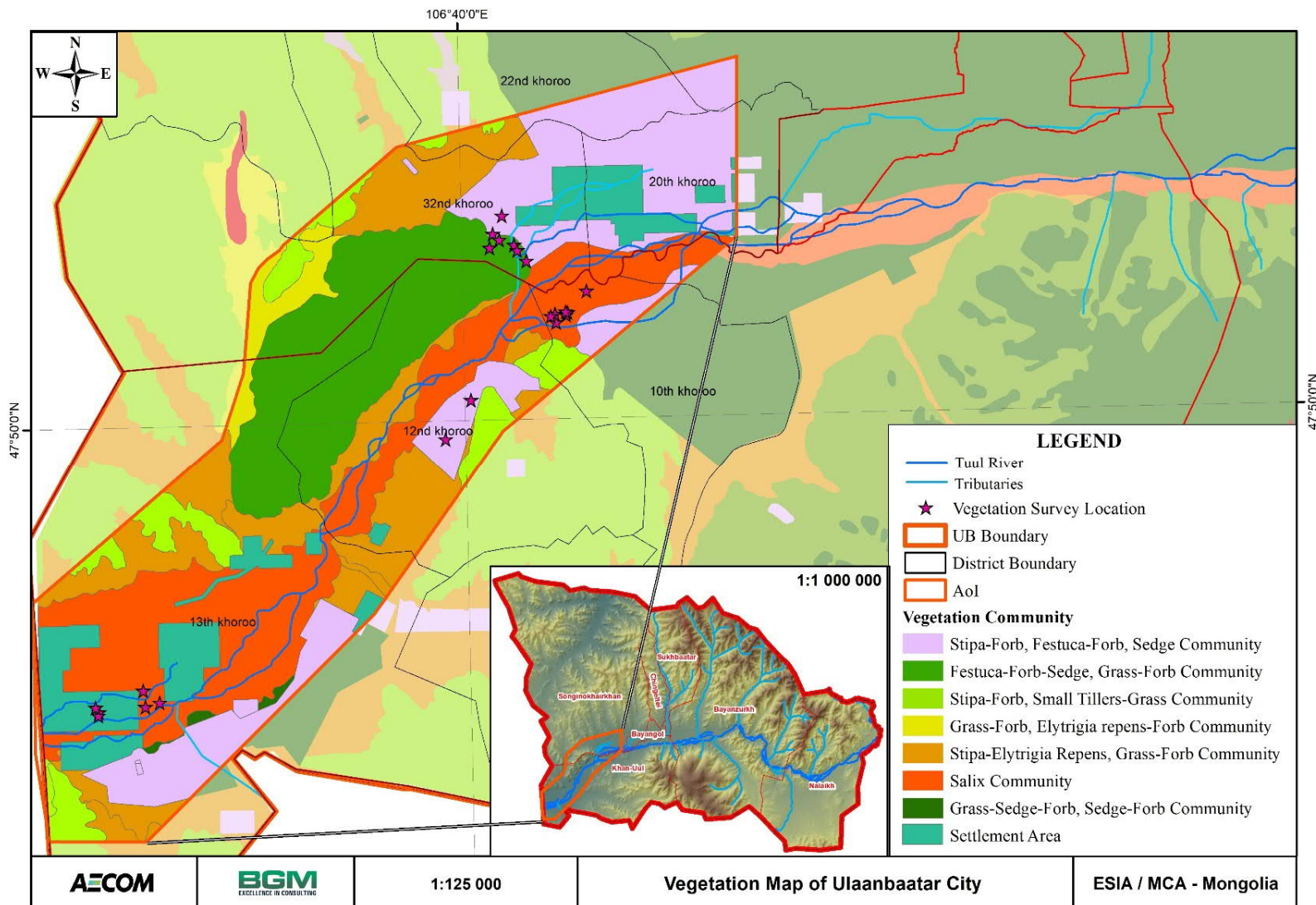
### **Proposed Conveyance Pipeline Routes**

- Fectuca-forb-sedge
- Stipa-forb-sedge

For the Aol, on average, 12 to 48 plant species were observed per 100 square meters of vegetation cover, and 5 to 12 species were observed per 1 square meter of vegetation. Percent plant cover was estimated as follows:

- 80.6 to 93.6 percent in the proposed Biokombinat wellfield area
- 37.4 to 79.6 percent in the proposed Shuvuun wellfield area
- 52.0 to 87.0 percent on the proposed AWPP site
- 23.4 to 51.5 along the proposed conveyance pipeline routes

The yield mass was estimated at 340 to 424 kilograms per hectare in the Biokombinat area; 180 to 250 kilograms per hectare in the Shuvuun area; and 230 to 510 kilograms per hectare on the AWPP site (see Table 6-27).



**Figure 6-84 Vegetation Map of Aol and downstream of UB city**

Table 6-27 Vegetation Monitoring in Aol

Vegetation Indicators									
No	Pasture type	Species number, in 100 m <sup>2</sup>	Species number, in 1 m <sup>2</sup>	Vegetation Cover, %	Dominant vegetation cover, %	Portion of Bare soil, %	Portion of Rock, gravel, %	Litter, %	Yield mass, kilograms /ha
1	Forb-grass-sedge-artemisia (93a /YX-II-3-3)	27	4-8	74.0	17.2	22.6	0.2	-	508.4
2	Elytrigia repens-sedge-forb (83a /YX-II-1-2)	35	6-10	68.0	23.6	30.8	1.0	0.2	325.6
3	Small tillers grass -forb-artemisia frigida (49/ Y-V-1-2)	33	6-10	52.0	6.4	30.3	17.4	-	231.4
4	Iris lacteal, (202/H-II-2-2)	7	5-7	87.0	-	13.0	-	-	500.4
5	Sedge-elytrigia repens-Artemisia adamsii (203/H-II-2-3)	12	5-8	73.2	18.4	26.2	0.6	-	334.2
6	Elytrigia repens-grass-sedge-forb-artemisia frigida (205/H-II-2-5)	48	8-12	80.6	1.4	16.4	1.8	1.2	423.8
7	Grass-sedge-forb (203/H-II-2-3)	24	8-10	93.6	-	3.2	-	3.2	423.6
8	Grass-sedge-forb-artemisia frigida (203a/H-II-2-3)	30	8-10	84.8	4.6	11.4	-	3.8	335.4
9	Small sedge, Sedge-grass-artemisia adamsii (228a/H-III-5-1)	26	6-10	75.8	4.4	19.8	-	6.4	259.6
10	Grass-forb-artemisia frigida (218a/H-III-2-2)	17	5-8	37.4	0.4	25.4	37.2	-	180
11	Elytrigia repens-grass-sedge—Artemisia (214a/H-III-1-1)	19	5-8	58.4	6.2	24.0	14.8	2.8	241
12	Grass-small sedge (219/H-III-2-3)	17	6-8	78.6	-	12.8	-	8.6	203.4
13	Sedge-grass-forb with Salix (208-209/H-II-4-1; H-II-5-1)	24	6-8	79.6	-	13.8	-	5.0	204.8

**Notes:** m<sup>2</sup> indicates square meter(s); ha indicates hectare. Details and a list of vegetation data are provided in Appendix D.

A total of 29 families, 81 genera, and 118 species of plants in the Aol were documented during the field survey (see Table D-1 in Appendix D). The classification structure of the flora of the Aol is summarized in Table 6-28.

Table 6-28 Classification Structure of Flora in Aol

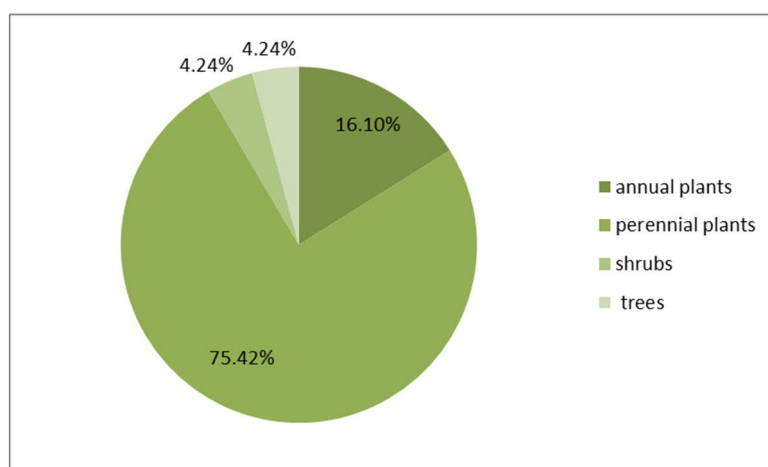
Classification Structure of Flora	Family	Genera	Species	
			Count	Percent
<b>Angiosperm</b>	29	81	118	100.0
<i>In:</i>				
<b>a. monocotyledons</b>	4	18	22	18.64
<b>b. dicotyledons</b>	25	63	96	81.36

The first 12 families are comprised 95 species (approximately 80.4 percent) of the flora and the remaining families of flora (from 13 to 29) each comprised only 1 to 3 species. The numbers of genera and species in the 12 dominant families are summarized in Table 6-29.

**Table 6-29 Main Classification of Flora**

No	Family	Genera	Species	Percent
1	Asteraceae Dumort	9	20	16.95
2	Gramineae Juss	15	16	13.56
3	Leguminosae Juss	7	11	9.32
4	Rosaceae Juss	4	10	8.47
5	Chenopodiaceae Vent	5	8	6.78
6	Ranunculaceae Juss	4	6	5.08
7	Caryophyllaceae Juss	3	4	3.38
8	Cruciferae Juss	3	4	3.38
9	Labiaceae Lindl	3	4	3.38
10	Scrophulariaceae Juss	3	4	3.38
11	Polygonaceae Juss	3	4	3.38
12	Salicaceae Mirb	1	4	3.38
	Total species	60	95	80.44

There were 118 species of plants recorded as growing in the Aol, including 19 species of annual plants (approximately 16.1 percent), 89 species of perennial plants (75.4 percent), 5 species of shrubs (4.2 percent) and 5 species of trees (4.2 percent) (see Figure 6-85).



**Figure 6-85 Plant Life Form in Aol**

In the Aol, the field survey recorded 89 pasture species and detailed information are shown in Table 6-30.

**Table 6-30 Features of the Species in the Aol**

Significance	Classification Taxon			Percent
	Family	Genera	Species	
Pasture plants	28	68	89	75.4
Medicinal herbs	23	43	57	48.3
Ruderal plants	13	23	34	28.8

There are no invasive species of concern in the Aol. The Aol has sufficient abundance of good edible species for livestock: Needlegrass (*Stipa Krylovii* Roshev.), Prairie Junegrass (*Koeleria macrantha* (Ldb.) Schult.), *Poa attenuata* Trin (*Poa botryoides* Trin.), Crested Wheatgrass (*Agropyron cristatum* (L.) P.B.), Meadow Foxtail (*Alopecurus pratensis* L.), Smooth Meadow-Grass (*Poa pratensis* L.), Wild Ryes (*Elymus dahuricus* Turch ex Griseb.), Quack grass (*Elytrigia repens* (L.) Desv. ex Nevski.), Great Burnet (*Sanguisorba officinalis* L.), Sickie Alfalfa (*Medicago falcata* L.), and Lupine Clover (*Trifolium lupinaster* L.).

The *Mongolian Law on Natural Flora* (1995, amended in 2015) classifies natural flora based on reserves<sup>46</sup> and restorative capacity (capacity to regenerate naturally), as follows:

- **Extremely rare** flora includes plant species with no natural regeneration capacity, very restricted distributions and no usable reserves, and that are in danger of extinction. The plants that are classified as extremely rare are listed in an appendix to the law.
- **Rare** flora includes plant species with limited natural regeneration capacities and limited distributions and reserves, and that potentially are at risk of extinction.
- **Common** flora includes all plant species that do not fall into the extremely rare or rare categories defined above.

During the survey no extremely rare flora were recorded in the study area. However, three rare species were found; i.e., Fragrant-flowered Garlic (*Allium odorum* L.), Chickweeds (*Stellaria dichotoma* L.), Sagebrushes (*Artemisia rutifolia* Steph. ex Spreng). In addition to these rare plants, we found the following:

- Six endemic or subendemic species: Milkvetches (*Astragalus galactites* Pall.), Littleleaf Peashrubs (*Caragana microphylla* (Pall) L.), Locoweed (*Oxytropis filiformis* DC.), *Agrostis mongholica* Roshev., Locoweed (*Oxytropis oxyphylla* (Pall.) DC.), and *Pedicularis flava* Pall
- Two relict species: Siberian elm (*Ulmus pumila* L) and Rutaceae Juss (*Haplophyllum dahuricum* (L.) G. Don).

In total, approximately 9.3 percent of the plants recorded during the survey are candidates for protection (see Table 6-31).

**Table 6-31 Endangered Plants in Aol**

Protection Status	Classification			Percent
	Family	Genus	Species	
<b>Very rare plant</b>	0	0	0	0.0
<b>Rare plant</b>	3	3	3	2.54
<b>Mongolian endemic plant</b>	1	1	1	0.85
<b>Subendemic plant</b>	4	4	5	4.24
<b>Relict plant</b>	2	2	2	1.7
<b>Total</b>				9.33

<sup>46</sup> The law defines flora reserves as consisting "all species of vascular plants, moss, algae, lichens, fungi and other microorganisms on the land and in the water in the territory of Mongolia."



## 6.1.13 Fauna

An integrated assessment of the Tuul River Basin (MEGD, 2012) identified fish, mammal, and amphibian/reptile species in five sub-basins of the Tuul River Basin (see Table 6-32). This Aol occurs within the 3<sup>rd</sup> and 4<sup>th</sup> sub-basins of the Tuul River Basin assessment (see Figure 6-86).

### 6.1.13.1 Mammals

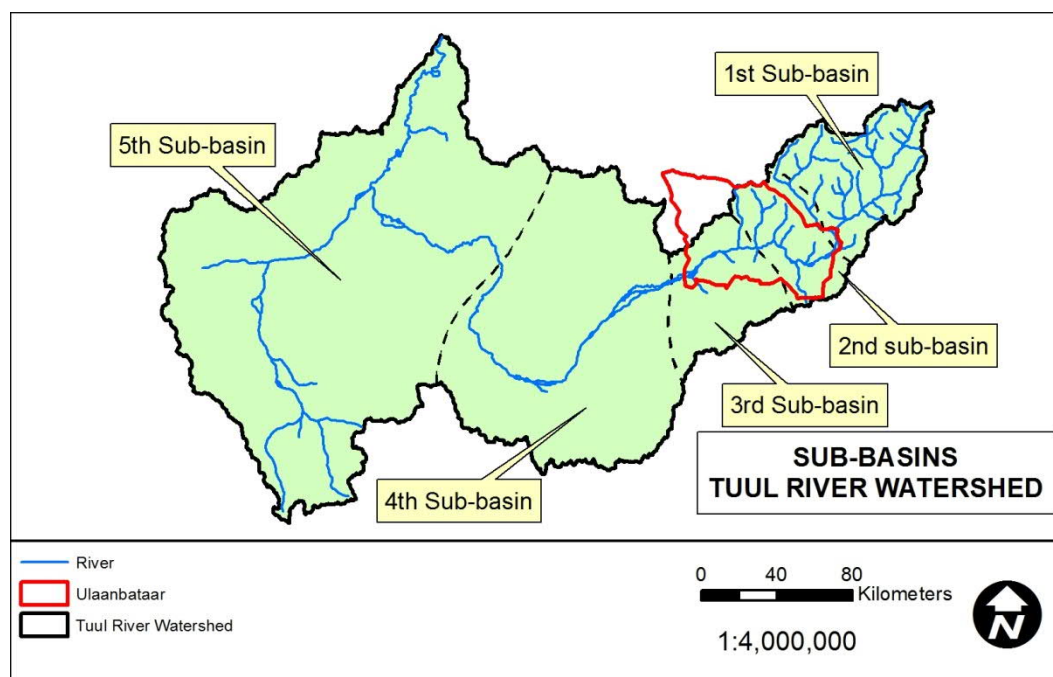
Within the sub-basin of Tuul River Basin there are approximately 60 mammal species belonging to 18 families and seven orders. Rodents (23 species) are the most prevalent order of animal species (MEGD, 2012). As shown in Figure 6-86 and Table 6-32, the Aol of BWSE project located in 3<sup>rd</sup> sub-basin (e.g., from Tuul-Zaisan to Altan-Bulag bridge) of Tuul River Basin.

**Table 6-32 Number of Species Found in Each Sub-Basin of the Tuul River**

Taxa	Sub-Basin				
	1st From Tuul River upstream to Tuul-Terelj monitoring station	2nd From Tuul- Terelj station to Zaisan monitoring station	3rd From Tuul- Zaisan station to Altan-Bulag bridge)	4th From Altan- Bulag bridge to Tuul-Lun monitoring station	5th From Tuul-Lun station to Orkhon-Tuul confluence
<b>Mammals</b>	50	39	37	33	45
<b>Fish</b>	14	8	9	9	13
<b>Amphibian and Reptiles</b>	2	2	2	2	2
<b>Birds*</b>	171				

**Note:** Birds were not distinguished by sub-basin.

**Source:** MEGD, 2012.



**Figure 6-86 Sub-Basins in Tuul River Basin**

Therefore, mammals in 3<sup>rd</sup> sub-basin are summarized based on previous studies (MEGD, 2012) as shown in Table 6-33.

**Table 6-33 Mammal Diversity in 3<sup>rd</sup> Sub-basin of the Tuul River Basin**

No	Common name	Scientific name	Regional status	Global status
1	Mongolian gazelle	<i>Procapra gutturosa</i>	Endangered	Least concern
2	Red deer	<i>Cervus elaphus</i>	Critically endangered	Least concern
3	Grey wolf	<i>Canis lupus</i>	Near threatened	Least concern
4	Corsac fox	<i>Vulpes corsac</i>	Near threatened	Least concern
5	Red fox	<i>Vulpes vulpes</i>	Near threatened	Least concern
6	Pallas's cat	<i>Otocolobus manul</i>	Near threatened	Near threatened
7	Eurasian lynx	<i>Lynx lynx</i>	Near threatened	Least concern
8	Asian Badger	<i>Meles leucurus</i>	Least concern	Least concern
9	Altai Weasel	<i>Mustela altaica</i>	Least concern	Least concern
10	Stoat	<i>Mustela erminea</i>	Least concern	Least concern
11	Steppe polecat	<i>Mustela eversmanii</i>	Least concern	Least concern
12	Least weasel	<i>Mustela nivalis</i>	Least concern	Least concern
13	Siberian weasel	<i>Mustela sibirica</i>	Least concern	Least concern
14	Northern bat	<i>Eptesicus nilssonii</i>	Least concern	Least concern
15	Brandt's bat	<i>Myotis brandtii</i>	Data deficient	Least concern
16	Daubenton's Myotis	<i>Myotis daubentonii</i>	Least concern	Least concern
17	Whiskered Myotis	<i>Myotis mystacinus</i>	Least concern	Least concern
18	Particolored bat	<i>Vespertilio murinus</i>	Least concern	Least concern
19	Daurian hedgehog	<i>Mesechinus dauuricus</i>	Least concern	Least concern
20	Tolai hare	<i>Lepus tolai</i>	Least concern	Least concern
21	Daurian pika	<i>Ochotona dauurica</i>	Least concern	Least concern
22	Siberian jerboa	<i>Allactaga sibirica</i>	Least concern	Least concern
23	Mongolian silver vole	<i>Alticola semicanus</i>	Least concern	Least concern
24	Grey red- backed vole	<i>Myodes rufocanus</i>	Least concern	Least concern
25	Striped dwarf hamster	<i>Cricetulus barabensis</i>	Least concern	Least concern
26	Long tailed dwarf hamster	<i>Cricetulus longicaudatus</i>	Least concern	Least concern
27	Brandt's vole	<i>Lasiopodomys brandtii</i>	Least concern	Least concern
28	Mongolian Gerbil	<i>Meriones unguiculatus</i>	Least concern	Least concern
29	Narrow headed vole	<i>Microtus gregalis</i>	Least concern	Least concern
30	Campbell's hamster	<i>Phodopus campbelli</i>	Least concern	Least concern
31	Long tailed ground squirrel	<i>Urocitellus undulatus</i>	Least concern	Least concern
32	Daurian ground squirrel	<i>Spermophilus dauricus</i>	Data deficient	Least concern
33	Siberian shrew	<i>Crociodura sibirica</i>	Data deficient	Least concern
34	Laxmann's shrew	<i>Sorex caecutiens</i>	Least concern	Least concern
35	Large toothed Siberian shrew	<i>Sorex daphaenodon</i>	Least concern	Least concern
36	Eurasian Least Shrew	<i>Sorex minutissimus</i>	Least concern	Least concern
37	Even toothed shrew	<i>Sorex isodon</i>	Data deficient	Least concern
38	Mongolian marmot	<i>Marmota sibirica</i>	Endangered	Endangered

As mentioned in Section 6.1.11, the Aol is characterized by common type of mountain-steppe ecosystems, meadow-steppe and floodplain meadow types of unique ecosystem found along the Tuul River Basin.

However, direct and indirect human activities such as urbanization, expansion of infrastructure, various land use (e.g., residential area, transport and agricultural), mining and processing minerals, and livestock grazing have resulted in land degradation and loss of habitat, which in turn has led to a decrease in the biodiversity in the Aol. Consequently, the natural flora and fauna mostly have been lost in the Aol.

The possibility to assess and identify natural characteristics of biodiversity in the Aol was limited due to urbanization in vicinity of the site. Moreover, Shuvuun and Biokombinat wellfield has been extensively altered by livestock grazing. Addition to this, Shuvuun wellfield has been extensively altered by gravel mining activities. However, fauna species were observed and recorded in Aol based on routine observations (see Figure 6-87). Table 6-35 shows the observed numbers of Mongolian marmot at each burrow cluster.

The mammals found in the Aol during our field investigations were Mongolian marmot, Daurian pika and Long-tailed ground squirrel.

Although the Mongolian marmot (*Marmota sibirica*) is classified as Endangered globally (Clayton, 2016), the species is classified as Endangered in the regional assessment (Clark et al., 2006), as shown in Table 6-34. The Mongolian marmots (see Table 6-35) were observed based on direct observation approach on the northern slopes of the Songinokhairkhan Mountain, where AWPP will be located (see Figure 6-88). The flight initiation distance for Mongolian marmot (*Marmota sibirica*) are approximately determined as 100 m based on field survey. This flight initiation distance is considered during the impact assessment (e.g. Section 7.7).

**Table 6-34 Species of Mammals in Aol**

No	Common name	Scientific name	Regional Status	Global Status
1	Mongolian marmot	<i>Marmota sibirica</i>	Endangered	Endangered
2	Daurian pika	<i>Ochotona dauurica</i>	Least concern	Least concern
3	Long-tailed ground squirrel	<i>Spermophilus undulatus</i>	Least concern	Least concern

**Table 6-35 Numbers of Mongolian Marmot**

Burrows cluster	Mongolian marmot number
Burrows cluster 1	8
Burrows cluster 2	6
Burrows cluster 3	2
Burrows cluster 4	9
Burrows cluster 5	6
Burrows cluster 6	8
Burrows cluster 7	2
Burrows cluster 8	6
Burrows cluster 9	4
Total	51*
*As of July 15, 2020	

There are no invasive species of concern in the Aol.

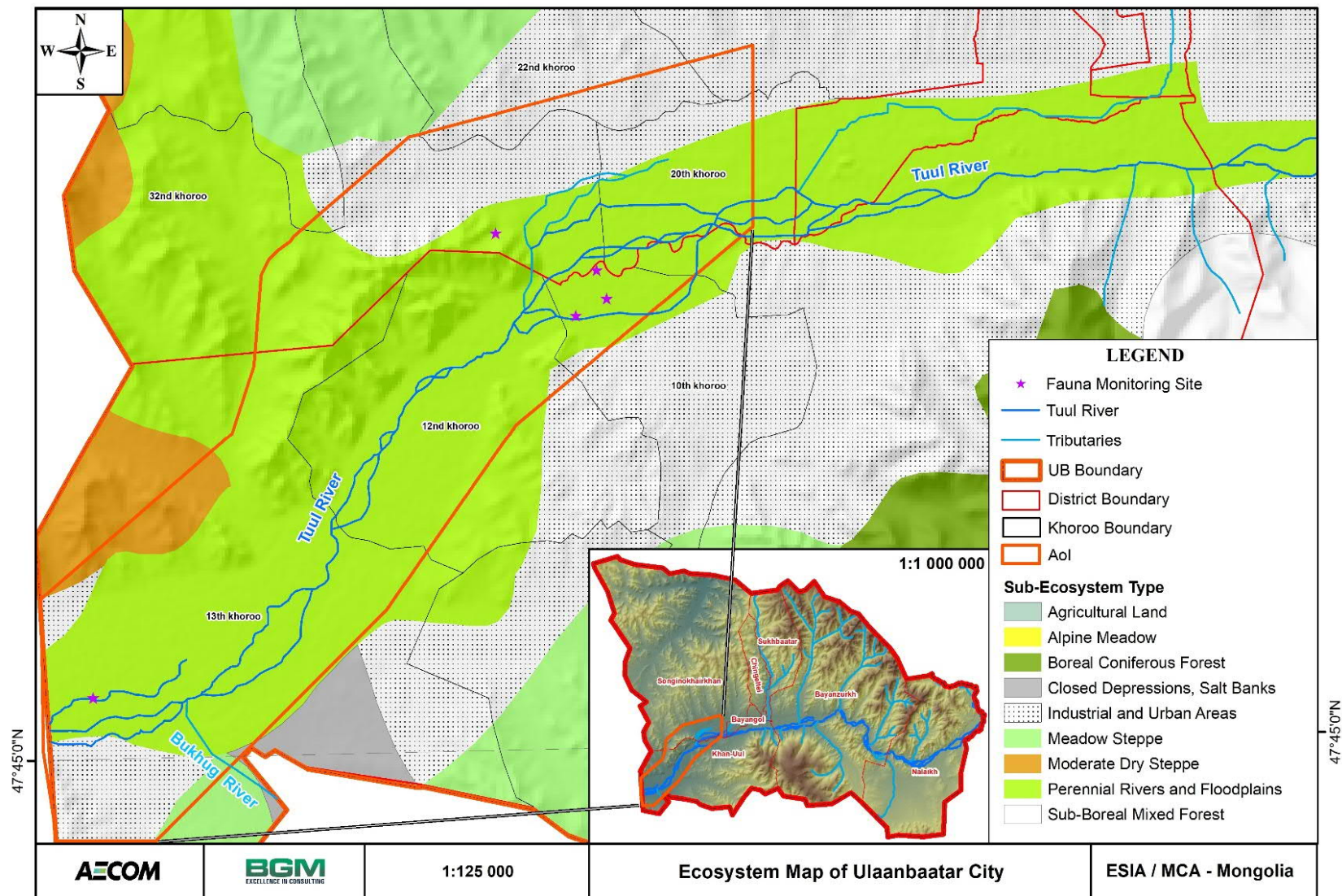
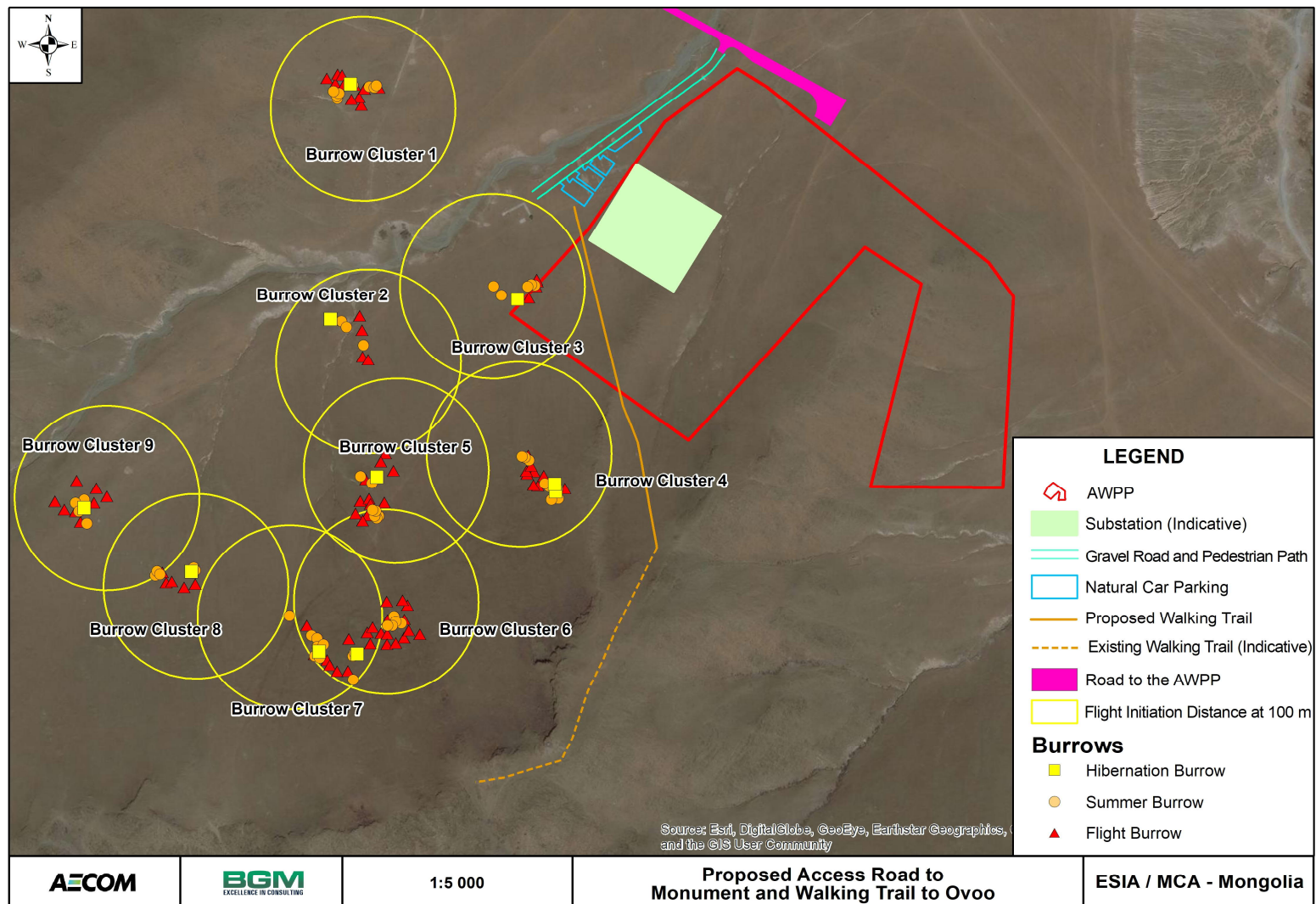


Figure 6-87 Ecological Map of UB and Observation Points for Fauna Survey





**Figure 6-88 Locations of the Mongolian Marmot Burrows nearby AWPP Site**



### 6.1.13.2 Birds

The integrated assessment of the Tuul River Basin (MEGD, 2012) identified 171 bird species in the basin, including 37 non-migratory and 134 migratory birds. The assessment did not differentiate the occurrence of birds by sub-basin.

Eight species summer in the Tuul River Basin and five species spend their winters in the basin. Twelve rare bird species and one very rare species, the white-naped crane (*Grus vipio*), are found in the basin (MEGD, 2012).

The primary threats to the white-naped crane, which is identified as vulnerable on the Mongolian Red List of Birds, include habitat loss and degradation associated with livestock, drought, and human disturbance (Gombobaatar and Monks, 2011).

There are only a few species of resident birds that live in Tuul River forest. The majority of these inhabit urban settlements. During the fauna survey, a bird observation survey was undertaken at three locations in the Aol; AWPP site, proposed Shuvuun and Biokombinat wellfields, and Tuul River riparian zone.

The birds recorded during the field survey include Magpie (*Pica pica*), Rook (*Corvus frugilegus*), Red-billed chough (*Pyrrhocorax*), Black kite (*Milvus migrans*), Common kestrel (*Falco tinnunculus*), and Demoiselle crane (*Grus virgo*). All of the birds are listed in the Least Concern category both regionally and globally according to IUCN Red List of Threatened Species (see Table 6-36).

**Table 6-36 Species of Birds Observed at the Aol**

No	Name	Regional status	Global status
1	Magpie ( <i>Pica pica</i> )	Least concern	Least concern
2	Rook ( <i>Corvus frugilegus</i> )	Least concern	Least concern
3	Red-billed chough ( <i>Pyrrhocorax</i> )	Least concern	Least concern
4	Black kite ( <i>Milvus migrans</i> )	Least concern	Least concern
5	Common kestrel ( <i>Falco tinnunculus</i> )	Least concern	Least concern
6	Demoiselle crane ( <i>Grus virgo</i> )	Least concern	Least concern
<b>Source: BGM, 2019.</b>			

### 6.1.13.3 Fish

The hydrological system of the Tuul River plays a critical role in the survival of fish as they migrate to deeper waters when portions of the river freeze (Yooshin, 2016). MEGD (2012) identifies 16 fish species in the Tuul River Basin based on occurrence in the sub-basins shown in Figure 6-86.

However, the World Wide Fund for Nature (WWF, formerly known as World Wildlife Fund) has recently developed comprehensive data on the fish populations and distributions within Mongolia that have greater spatial resolution (Mendsaikhan et al., 2017).

Mendsaikhan et al., 2017, lists 20 species that occurred in the Tuul River Basin.

Ten of the 20 species listed in the Tuul River Basin occurred in the Tuul River assessment 3<sup>rd</sup> sub-basin and potentially in the Aol (Mendsaikhan et al., 2017).

Table 6-37 lists the species of fish that are reported to have occurred in the 3<sup>rd</sup> sub-basin.

Table 6-37 also list the species' regional status, based on the Mongolian Red List of Fishes (Ocock et al., 2006), and their IUCN Red List status and population trend (IUCN, 2017).

Table 6-37 Fish Reported for the Tuul River in the Aol

Common Name	Scientific Name	Regional Status	IUCN Status	Red List	IUCN Trend	Population
Siberian stone loach	<i>Barbatula toni</i>	Least concern	Not assessed		Not assessed	
Siberian spiny loach	<i>Cobitis melanoleuca</i>	Least concern	Least concern		Unknown	
Eurasian minnow	<i>Phoxinus phoxinus</i>	Least concern	Least concern		Unknown	
Stone moroko	<i>Pseudorasbora parva</i>	Data deficient	Least concern		Unknown	
Lagowski's (Eastern Siberian) minnow	<i>Rhynchocypris lagowski</i>	Data deficient	Not assessed		Not assessed	
Burbot	<i>Lota lota</i>	Data deficient	Least concern		Stable	
Olivai's spiny loach	<i>Cobitis olivai</i>	Data deficient	Not assessed		Not assessed	
Lenok	<i>Brachymystax lenok</i>	Vulnerable	Not assessed		Not assessed	
Czekanowski's minnow	<i>Rhynchocypris czekanowskii</i>	Data deficient	Least concern		Unknown	
Amur (East Asian) catfish	<i>Silurus asotus</i>	Least concern	Least concern		Unknown	

Source: WWF, 2017a; Ocock et al., 2006; IUCN, 2017

Of the ten species listed above, the lenok (*Brachymystax lenok*) is the only species listed with any known population status concerns. Lenok is listed as “vulnerable” by the Mongolian Red List (Ocock et al., 2006), but has not been assessed by IUCN (2020). This species occurs throughout the Tuul River watershed (Mendsaikhan et al., 2017). Lenok, also called Central Asian trout (Dulmaa, 1999), are benthopelagic fish that inhabit rivers. Lenok is a native salmonid species of Mongolia (Dulmaa, 1999). They are slow-growing fish (Dulmaa, 1999), and average around 60 centimeters in length and can weigh up to 8 kilograms (FishBase, 2020). Lenok are iteroparous spawners with the ability to spawn multiple times throughout their lives. Females produce between 2,200 and 7,000 eggs annually. All life stages typically occur in fluvial environments. Lenok sometimes occur in deeper lake environments; these individuals typically occur near the river junctions where they seek refugia from frozen rivers during winter. Lenok feed on benthic organisms and non-commercial fish. Spawning occurs in late spring when ice melts, from the end of April to the end of May at a water temperature of 5 to 10 degrees Celsius (Dulmaa, 1999). Lenok is a valuable sport species that is sought by anglers (Dulmaa, 1999).

Degraded water quality is one of the reasons for the population decline of lenok (Stubblefield, 2005). Lenok prefer cold, clear, oxygen-rich water (Dulmaa, 1999). Although Mendsaikhan et al., (2017) reports that lenok occurred in the Tuul River assessment 3rd sub-basin, if the species occurs anywhere in the Aol, it is expected that lenok are absent from the river downstream of the CWWTP outfall where water quality is severely degraded. Invasive species, such as stone moroko and Eurasian minnow, that are more tolerant of poor water quality, including low dissolved oxygen concentration, and more tolerant of waters burdened with high pollution loads are more likely to occur downstream of the CWWTP outfall.

#### 6.1.13.4 Amphibians and Reptiles

Two of the amphibians and reptiles found in the river basin, Mongolian toad (*Bufo raddei*) and the steppes rat snake (*Elephe dione*) are listed on the Mongolian Red List of Amphibians and Reptiles (MEGD, 2012). The Mongolia toad inhabits the edges of a range of habitats, including forests, bush lands, forest steppes, oases in dry steppes, and rocky and alluvial soils, and is present in many human settlements. The species breeds in pools, ditches, and other stagnant waterbodies (Kuzmin et al, 2004). The steppes rat snake occupies a range of habitats across Mongolia except high mountain zones (Yooshin, 2016).

### 6.1.13.5 Aquatic Invertebrates

A total of 80 aquatic invertebrate species in 11 orders were found in the Tuul River Basin (Sosorburam, 2017). The number of species in each order is listed in Table 6-38. However, these findings are for the entire river basin and are not specifically representative of the Aol.

**Table 6-38 Invertebrates Found in the Tuul River Basin**

Order	Number of Species	Order	Number of Species
Ephemeroptera	25	Aquatic coleopteran	2
Plecoptera	15	Botfly	2
Trichoptera	17	Megolaptera	1
Diptera	8	Crab	1
Species of water bug	1	Mollusca	3
<i>Source: Sosorburam, 2017</i>		Aquatic worms	4

Out of the 80 species recorded in the Tuul River Basin, 59 species were found in the Tuul-Ulaanbaatar station and 35 species in the Tuul-Altan-Bulag station as shown in Table 6-39. Ephemeroptera, Plecoptera and Trichoptera are very sensitive to pollution as well as are used as indicators of good watershed health. The species numbers of Ephemeroptera, Plecoptera and Trichoptera, especially Plecoptera, were much higher (67.8 percent) in the Tuul-Ulaanbaatar, whereas were markedly few, only 22.8 percent in the Tuul-Altan-Bulag. In addition, pollution-tolerant invertebrates, such as Chironomidae (Diptera), Mollusca, Hirudinea, and Aquatic worm, were more abundant in the Tuul-Altan-Bulag. These organisms can survive in water with low dissolved oxygen, turbid waters or nutrient-enriched waters.

**Table 6-39 Invertebrates Found in the Aol**

Order	Tuul-Ulaanbaatar	Tuul-Altan-Bulag
Ephemeroptera	14	1
Plecoptera	12	0
Trichoptera	14	8
Diptera	10	9
Species of water bug	1	0
Aquatic coleopteran	2	6
Megolaptera	1	0
Mollusca	5	6
Hirudinea	0	3
Crab	0	1
Aquatic worms	0	1

### 6.1.13.6 Seasonal Sensitivity

Birds that inhabit the Tuul River Basin are typically migratory species that use the area for feeding and resting. Many die during the fall and spring due to a lack of food, diminishing water, hunting activity, and lack of habitat. Some migratory birds—including swan goose (*Anser cygnoides*), bean goose (*Anser fabalis*), bar-headed goose (*Anser indicus*), tundra swan (*Cygnus columbianus*), ruddy shelduck (*Tadorna ferruginea*), Eurasian wigeon (*Anas penelope*), mallard (*Anas platyrhynchos*), and black-necked grebe (*Podiceps nigricollis*)—lay eggs and rear young in the Tuul River Basin. They spend summer there when they are most vulnerable to predation and where they are dependent on resources in the area to successfully reproduce.

Aquatic species have varying breeding and migration cycles. The warm season can be the most sensitive time for aquatic animals. Almost all fish in the Tuul River spawn in the spring. There are certain environmental conditions required for spawning due to the requirements of the developing eggs that have been deposited. For example salmonid fish eggs, such as lenok, require a high

level of oxygen to develop into larvae (Bjornn and Reiser, 1991). Lenok spawning occurs in late spring after the ice melts. This occurs from the end of April to the end of May when the water temperature is between 5 and 10 degrees Celsius (Esteve, 2008). The fishing season for all species is closed across Mongolia from November 1<sup>st</sup> until June 15<sup>th</sup> per the MET. This attempts to protect fish when they are congregated in their wintering grounds and assembled in shallow areas for spawning, and are most vulnerable to harvest. However, these regulations lack enforcement and may not remain in effect late enough in the season to protect some spawning fish (Vander Zanden et al., 2007).

Aquatic insects and invertebrates typically breed and grow in the warm season. Some larvae live underwater for two to five years until they emerge in the spring and summer to breed and lay eggs in the water before dying. Others have different lifecycles. There is a lack of sufficient research of water insects in Mongolia, but research on species in other countries has shown that the larvae of spring insects live in the water for 3 to 5 years after which the individual reaches maturity and live from May until June. Larvae of (*khoovgon*) insects live for 1 to 2 years and adults live from June until September. The Chironomidae family occur in Mongolia (Dulmaa, 1999). In cold climates, these aquatic insects typically spend seven years in the aquatic phase of their life cycle, only emerging for 2 to 5 days to reproduce and die. These insects congregate in great numbers on and around the riverbank at discrete times that occur from the middle of May until September.

#### 6.1.13.7 Endangered Species

Approximately 20 percent of the 60 mammal species in the Tuul River Basin are listed as rare or near threatened species, and there are 12 listed rare and 1 very rare bird species in the basin (MEGD, 2012). Table 6-40 lists species in the Tuul River Basin that are identified as endangered or critically endangered in the region on the Mongolian Red List.

Although the integrated assessment of the Tuul River Basin (MED, 2012) does not indicate that the species occurs in the basin, in 2012, endangered Eurasian beaver (*Castor fiber*) from Germany and Russia—not the indigenous subspecies *Castor fiber birulai*—were introduced to the headwaters of the Tuul River (Jacob, 2012; Anudari, 2018), upriver and distant from the Aol. As discussed in Section 6.1.13.3, lenok is the only protected fish species in the Aol that is listed by IUCN or the Mongolian Red List. This species is listed as vulnerable by the Mongolian Red List (Ocock et al., 2006) and was not assessed by IUCN (2020).

**Table 6-40 Endangered or Critically Endangered Species in the Tuul River Basin**

Species		
Common Name	Scientific Name	Regional Status
Elk or red deer	<i>Cervus elaphus</i>	Critically Endangered
Mongolian marmot	<i>Marmota sibirica</i>	Endangered
Eurasian beaver	<i>Castor fiber</i>	Endangered
Mongolian gazelle	<i>Procapra gutturosa</i>	Endangered
White-headed duck	<i>Oxyura leucocephala</i>	Endangered
Greater spotted eagle	<i>Aquila clanga</i>	Endangered
Pallas's fish-eagle	<i>Haliaeetus leucoryphus</i>	Endangered
Short-toed snake-eagle	<i>Circaetus gallicus</i>	Endangered
Siberian sturgeon	<i>Acipenser baerii</i>	Critically Endangered
Taimen	<i>Hucho taimen</i>	Endangered
Source: Clark et al. 2006; Ocock et al., 2006; Gombobaatar et al., 2011; Jacob, 2012; Anudari, 2018.		

#### 6.1.14 Protected Areas

Special protected areas within the Tuul River Basin are shown in Table 6-41.

Table 6-41 Protected Areas in the Tuul River Basin

Protected Area	Type of State Protected Area	Area (kilometers squared)
Khan Khentii	Strictly Protected Area	100,531.6
Gorkhi-Terelj	National Park	289,190.9
Bogd Khan Mountain	Strictly Protected Area	413,48.5
Moltsog Els	Nature Reserve	487.9
Khustai Mountains	Nature Reserve	48,399.4
Batkhaan Mountain	Nature Reserve	20,111.5
Khugno Khaan Mountain	Nature Reserve	84,143.2
<b>Total</b>		<b>584,243.0</b>

#### 6.1.14.1 Gorkhi-Terelj National Park

Gorkhi-Terelj National Park was established in 1993. The park, located 50 to 76 kilometers east of UB, is the third largest protected area in Mongolia. It has specific natural attractions and varied rock formations. The area includes the southern ranges of Baga Khentii Mountain, North and South Gorkhi, Zaan and Terelj River Basin, and the upper Tuul River. The highest point is Avkhaan Mountain at an elevation 2,664 meters above sea level. The proposed Western Wellfields, including associated AWPP and conveyance infrastructure, would not be located within the national park.

#### 6.1.14.2 Bogd Khan Mountain

Bogd Khan Mountain is a strictly protected area with a peak of 2,256 meters that overlooks UB from the south. The area extends 32 kilometers east to west and 16 kilometers north to south. The landscape of Bogd Khan includes dense coniferous forest, bare rock, and open grassland with wildflower meadows. Bogd Khan Mountain was declared a protected site by the local Mongolian government of the Qing Dynasty in 1778 and is the oldest legally protected natural area in the world. The area was designated a strictly protected area in 1995 (Tourist Information Center, 2017). No new wells or infrastructure are proposed within the strictly protected area.

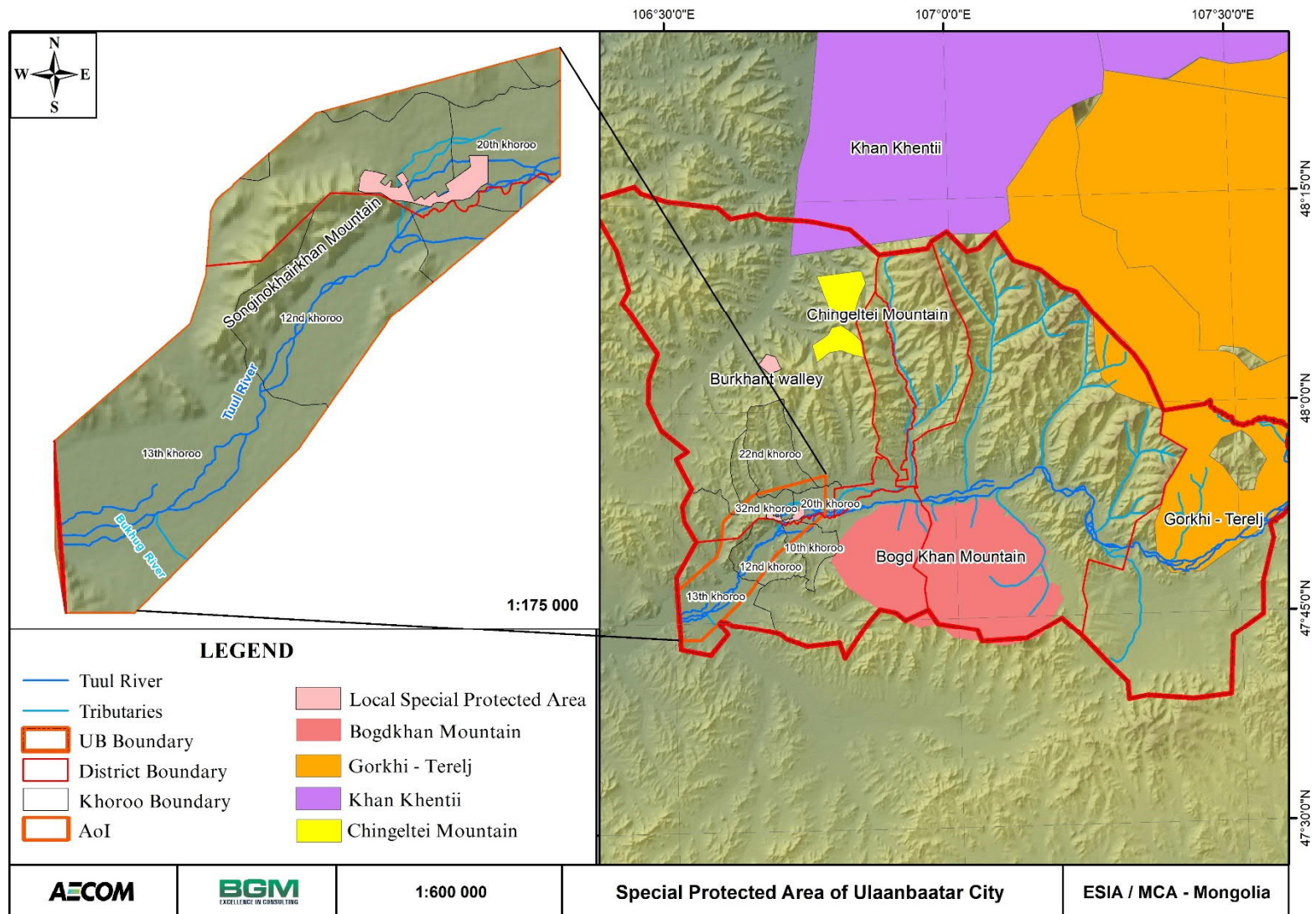
The Aol is located at a distance of 3.8 kilometers from the restricted zone of the Bogd Khan Mountain SPA and 38 to 40 kilometers from Gorkhi Terelj National Park. The proposed AWPP site is located nearby locally protected Songinokhairkhan special protected area (Table 6-42 and Figure 6-89). The designation is for "Protection of natural beauty, location of sources of environmental pollution, rivers, river basins and basins with special impact on the environment"<sup>47</sup>

Table 6-42 Protected Areas in Aol

No	Protected Area	Classification	Year
1	Songinokhairkhan	Local protected	Resolution 5/2, 2013, amended, 2020

<sup>47</sup> Songinokhairkhan District Citizens 'Representatives' Khural Annex 2 to the Resolution No. 5/2 of August 16, 2013. Amended ,2020





**Figure 6-89 Location of Special Protected Area around the Aol and UB city**

## 6.2 Socio-Economic and Gender Baseline Conditions

### 6.2.1 Context

The Bulk Water Supply Expansion (BWSE) project aims at meeting the projected demand in water for the city of UB for residential consumers, and commercial and industrial users. The project infrastructure is constructed in two of UB's peri-urban communities, the Khan-Uul and Songinokhairkhan districts. These communities are located in residential neighborhoods locally known as the "ger districts." Ger districts' expansion followed the rapid urbanization of Mongolia and the influx of migrants moving to the city for better economic opportunities (Plueckhahn & Terbish 2018). Terbish and Rawsthorne (2016) generally describe the peri-urban communities as being in the margins of the mainstream economies with limited urban infrastructures and characterized by social exclusion. Many households are living in Gers, others in apartment blocks etc.

The planned two wellfields and the water transmission pipelines will be constructed on the territory of khoroo 10, 12 and, 13 of Khan-Uul district. In contrast, the planned AWPP will be constructed on the territory of the khoroo<sup>48</sup> 32 of Songinokhairkhan district. In addition to this, the finished water pipeline from the AWPP to USUG connection point would be constructed on the territory of khoroo 32 and 20 of Songinokhairkhan district. The administration boundary of each khoroo of Khan-Uul and Songinokhairkhan district are shown in Figure 6-90. The AoI of each khoroo varies depending on their territory area as shown in Table 6-43.

**Table 6-43 Areas of Khorooos**

Khoroo	Area, hectare
Khoroo 10 of Khan-Uul district	3,261.1
Khoroo 12 of Khan-Uul district	5,705.6
Khoroo 13 of Khan-Uul district	12,572.3
Khoroo 32 of Songinokhairkhan district	8,466.5
Khoroo 20 of Songinokhairkhan district	2,122.6

While the implementation of the BWSE project will profit the population of UB, the construction of the two wellfields, the water transmission pipelines, and the AWPP will have direct and cumulative impacts on the local communities of the Khan-Uul and Songinokhairkhan districts. Social impacts as consequences of the project implementation occur, at varying magnitude, during the pre-construction, construction, and operation and maintenance phases (Cf. Section 3 for details of impact classification).

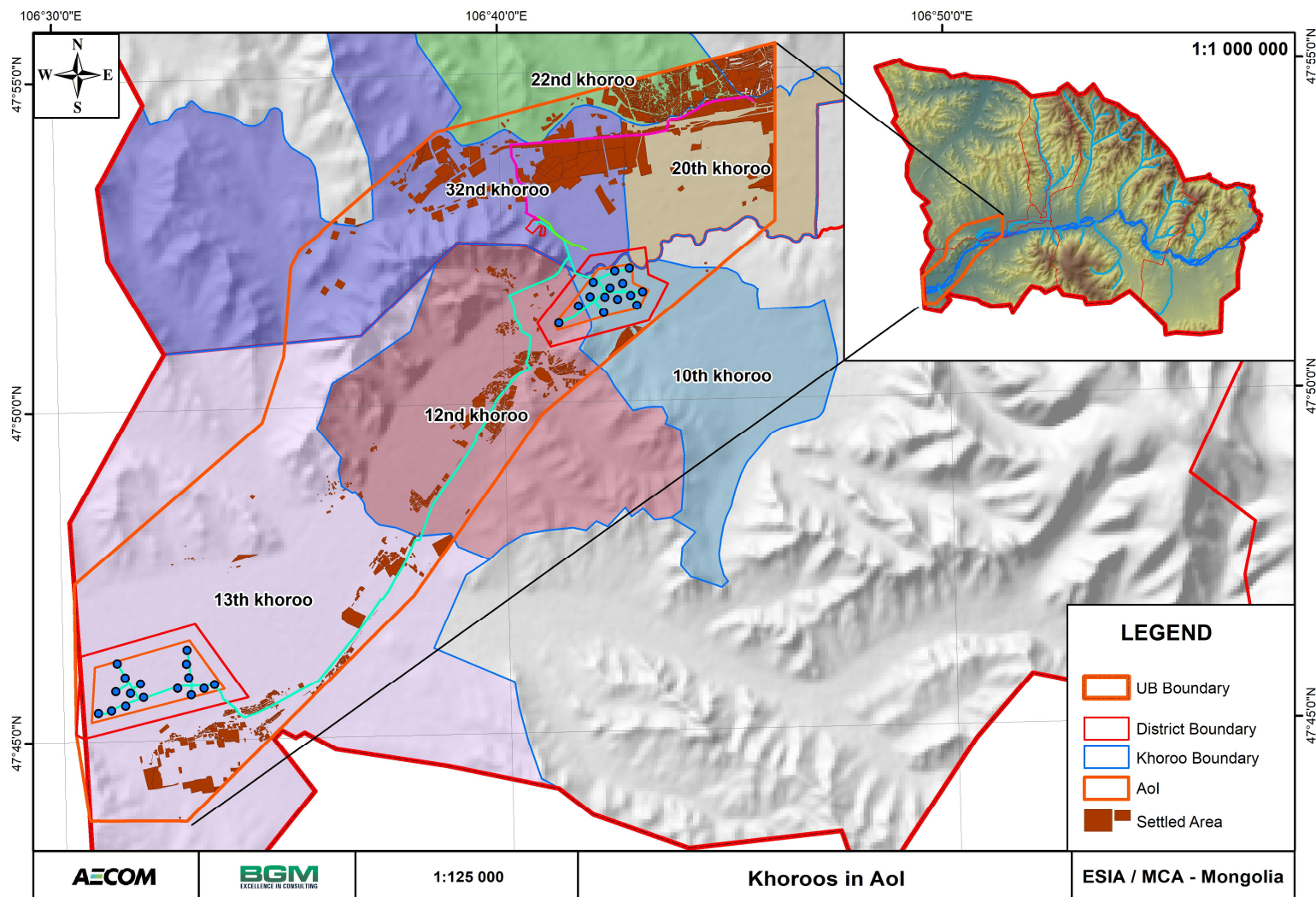
The report also identifies and describes potential impacts in the project area. The quantitative data presented below are from a socio-economic baseline survey taken in 2020 by AECOM and BGM, from the affected communities with a sample of 159 households (e.g. covering 567 individuals) were selected for the survey using a purposive sampling method. A purposive sample is a non-probability sample that is selected based on characteristics of the population and the objective of the study. The main objective of a purposive sample is to produce a sample that can be logically assumed to be representative of the population.

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<sup>48</sup> Ulaanbaatar city is divided into nine districts, which are further subdivided into khorooos (sub-district,) and each khoroo is further divided into kheseqs (micro- districts). Kheseqs are the smallest administrative units containing no more than few hundred households.

Due to COVID-19 pandemic restriction only households from the project area that agreed to participate in an interview are selected for the survey. The sample size was determined based on budget and time restriction.

Qualitative information comes mainly from Key Information Interviews and Focus Group discussions conducted in the Aol of the BWSE project. These methods are described in detail in Section 3.3.



**Figure 6-90 Administration Boundary of Khoroo**



## 6.2.2 Community Structures and Social Networks

Khan-Uul and Songinokhairkhan districts are peri-urban communities of the city of Ulaanbaatar. These are constituencies for elected representatives to the national parliament. An elected Governor leads each district with the assistance of a district Council. Each district is composed of khoroods as the lowest administrative unit. An elected leader (khoroonii darga) takes care of the khoroo's administration with the assistance of a Khoroo Council, including that of a social worker. The social worker office is an institution from the socialist era (Terbish & Rawsthorne 2016) in charge of the socioeconomic conditions of the community, providing assistance and information about available socioeconomic resources. The formal power system in these communities follows the democratic set up of the country.

NGOs and similar social organizations, including some faith-based organizations (e.g., the Catholic Church, the World Vision), serve the project area while having their headquarters in UB. NGOs and Faith-based organizations deploy services and ministries to assist vulnerable inhabitants of the ger districts.

Additionally, there exist informal system(s) of power where members who share common ethnic identity may group into local associations to exercise influence on the formal structure of power, especially during the election season, to channel resources to their respective communities. Such informal systems of power and resources consist of professional associations, associations through schools, and sporting activities.

From a socioeconomic perspective, the communities of the Khan-Uul and Songinokhairkhan Districts have overlapping types of economic activities (Plueckhahn & Terbish 2018) and residential structures – some are ger communities, others comprise blocks of apartments and variations between ger and permanent structures. The settled area in Aol is shown in Figure 6-91, Figure 6-92, Figure 6-93.

Households that are closer to the urban center or a hub have access to better services and economic opportunities than those in the fringe of the communities. Households in the vicinity of the international airport or those closer to the main paved roads have easier access to public services such as transportation, communication, shopping, and to (better) educational and health institutions. Households in the fringes of the districts have more limited access to socioeconomic opportunities that leads social exclusion.

The ger districts tend to attract new migrants to the UB conurbation who have to settle in the periphery of the district territories where land is still available but where connection to the socioeconomic infrastructures is limited. Many of these households are vulnerable as a result of their immigration status, the lower access to employment, lower levels of income and support services.

The influx of migrants since the collapse of socialism has put pressure on the social services of the districts, while available resources have not increased. The District Citizen Council looks after the interests of the entire community while the District Social Worker is in charge of reaching out to the citizens, mostly the new migrants, assess their needs, and connect them to available resources and services. Every district runs a family clinic (Orkhii emenleg) that provides primary care to the district household members. Both the social worker and the family clinic services have seen their capacity and resources exceeded by the needs.

Although located at the periphery of the city, residents have survival networks of solidarity and resilience (Bamana 2019), between the inhabitants of the ger district and those of the city, the countryside, and beyond. The networks of solidarity channel services and goods between people connected through kinship ties and alliances. Such networks of solidarity explain the sustainability of livelihood systems in vulnerable economic contexts. Some households in the district receive



monetary remittance from relatives working abroad (e.g., South Korea and others), or they source food from friends and relatives living in the countryside. People receive services from friends, families, and allies in the city free of charge based on social indebtedness, negotiations, and reciprocity through networks of solidarity and resilience that expand the socioeconomic space of the residents of Khan-Uul and Songinokhairkhan districts.

The impacts of resettlement and relocation on communities in the area of influence in Khan-Uul District are small. There are 65 plots affected, mostly by small marginal landtake which does not affect the livelihood of those on the plot. There will be no physical displacements of households and no permanent economic displacements. Only 2 unoccupied plots will be reallocated to the PAPs elsewhere and one businesses will be subject to temporary closure during works. Whilst the RAP for the Songinokhairkhan district communities has yet to be finalized, given the linear nature of the project along roadways, similar types of impact are expected, though temporary economic impacts will likely be greater given the greater number of businesses in the area of influence of Songinokhairkhan district. Current estimates of affected properties in SKhD number 90 parcels. The affected parcels (e.g. resettlement and relocation) in Aol due to the BWSE project activities are shown in Figure 6-94, Figure 6-95 and Figure 6-96. Detailed information of affected parcels can be found in RAP report.

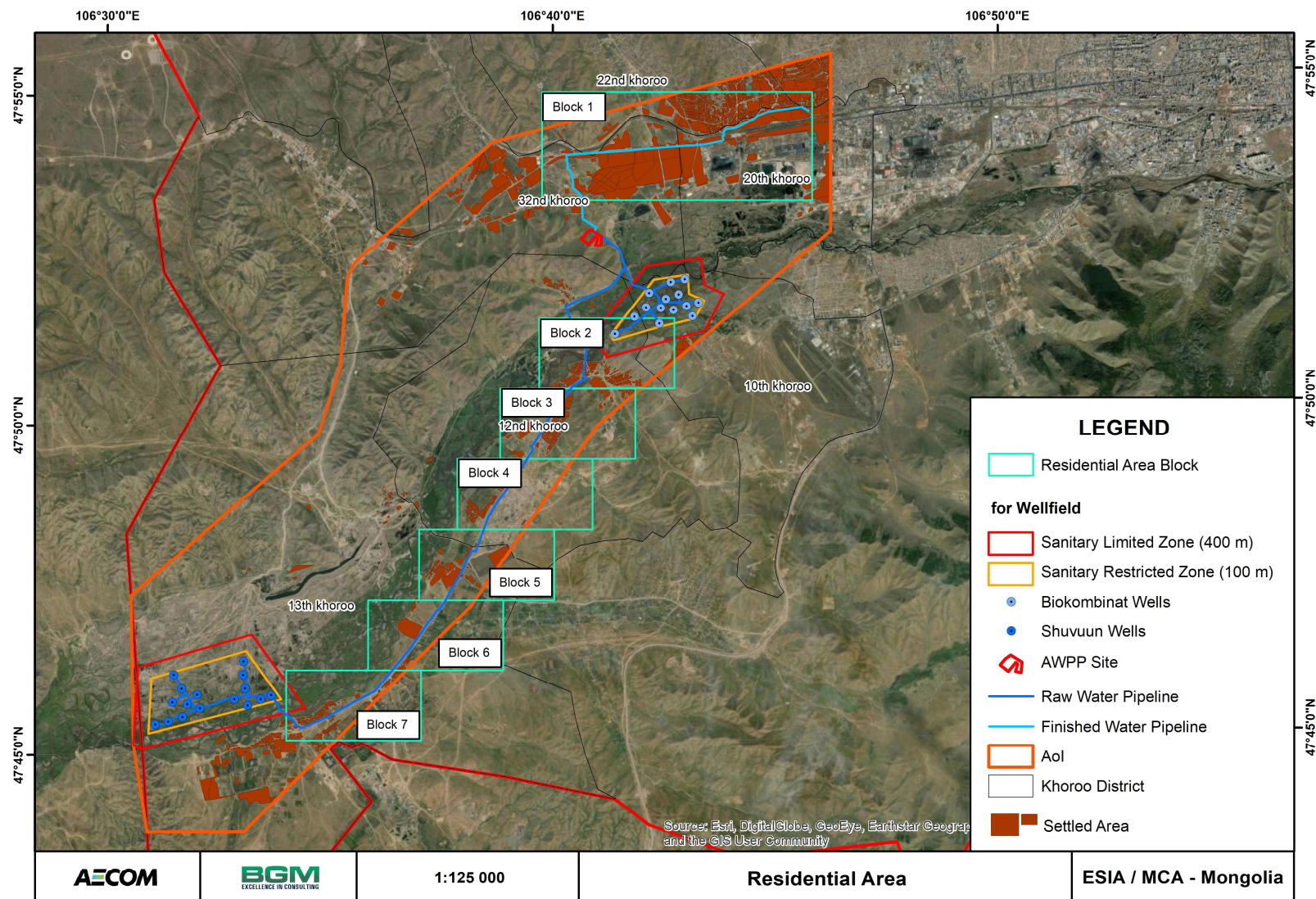


Figure 6-91 Settled Area in Aol.



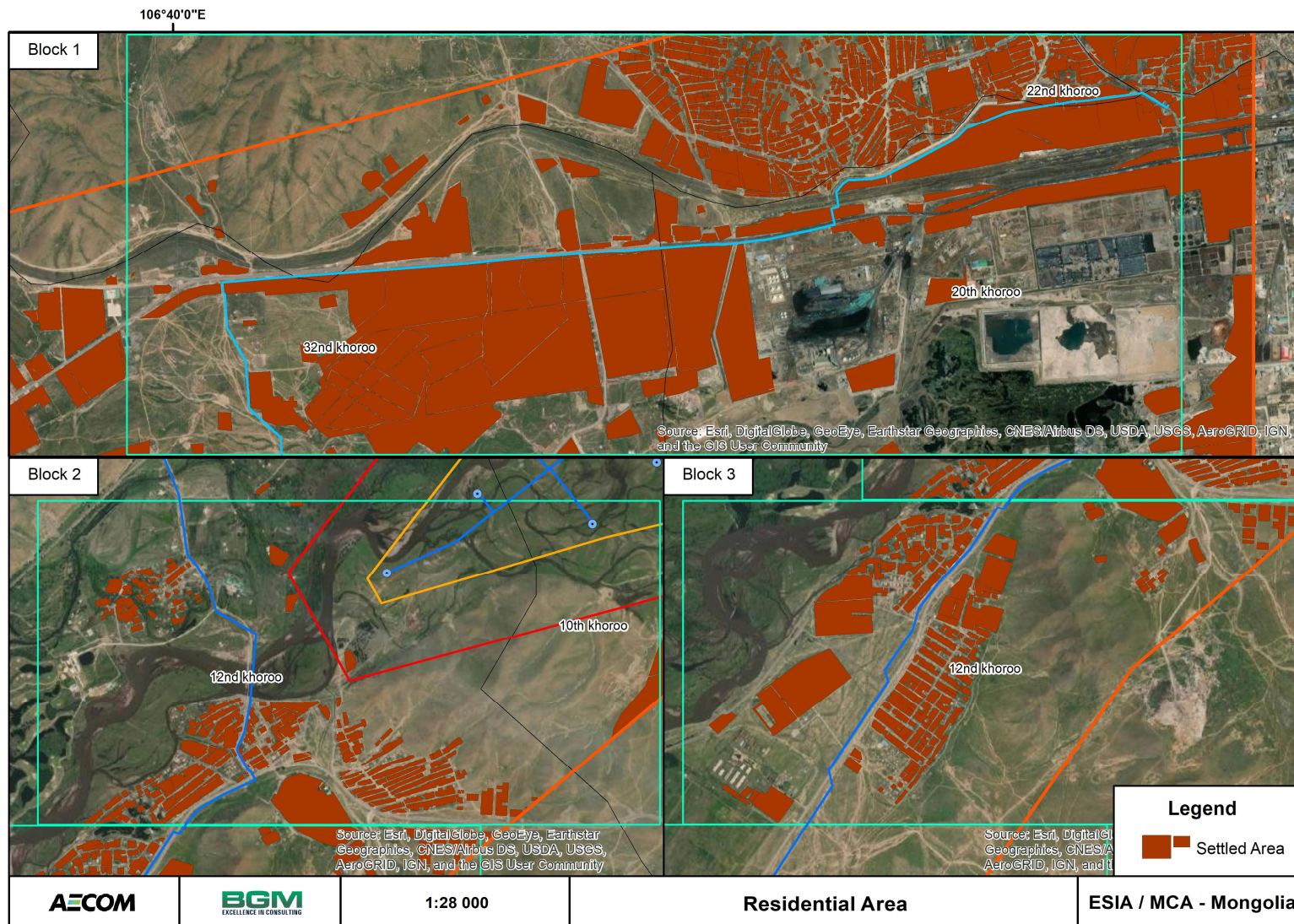


Figure 6-92 Settled Area in Aol.



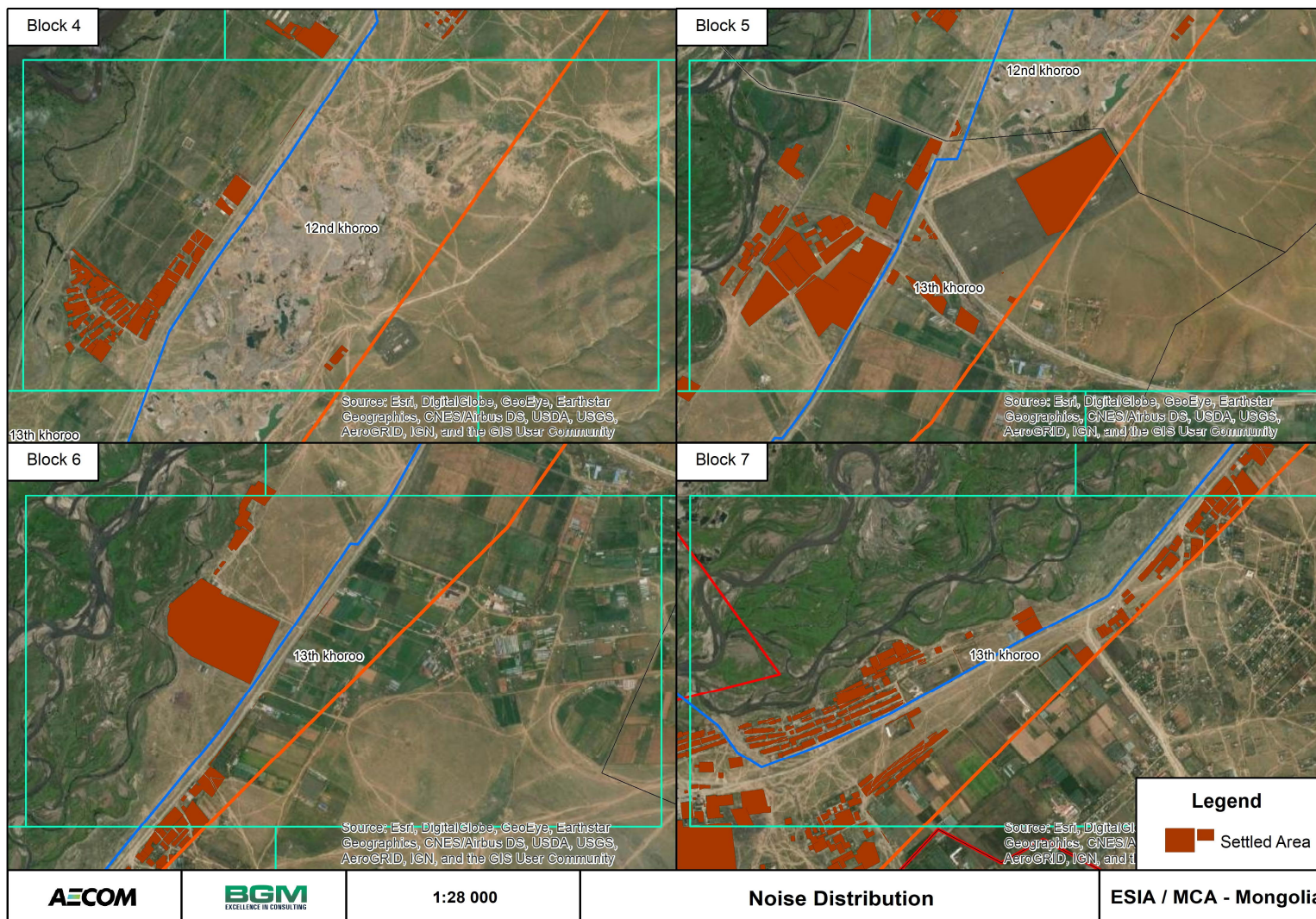


Figure 6-93 Settled Area in Aol.



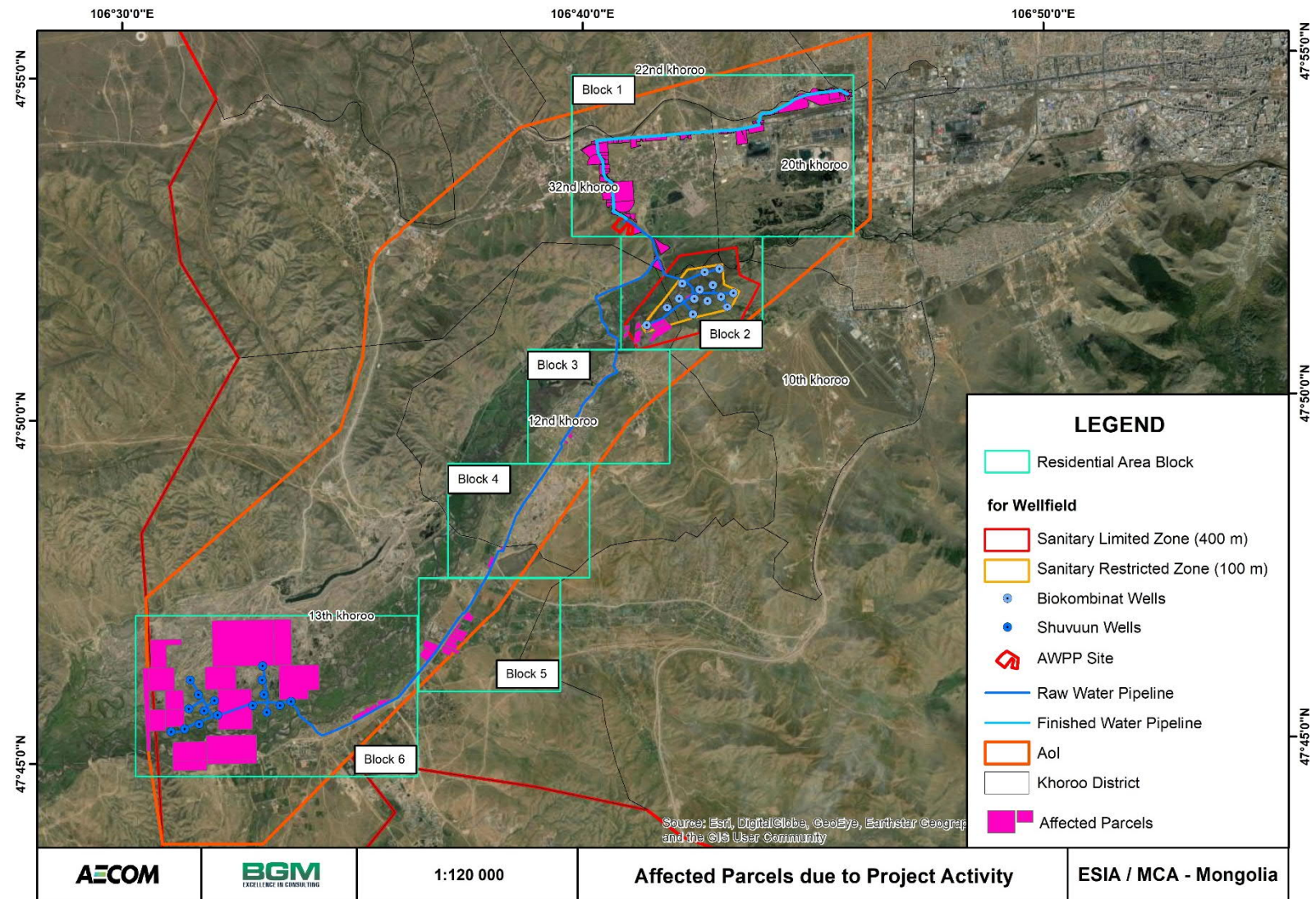


Figure 6-94 Affected Parcels due to the Project Activities.



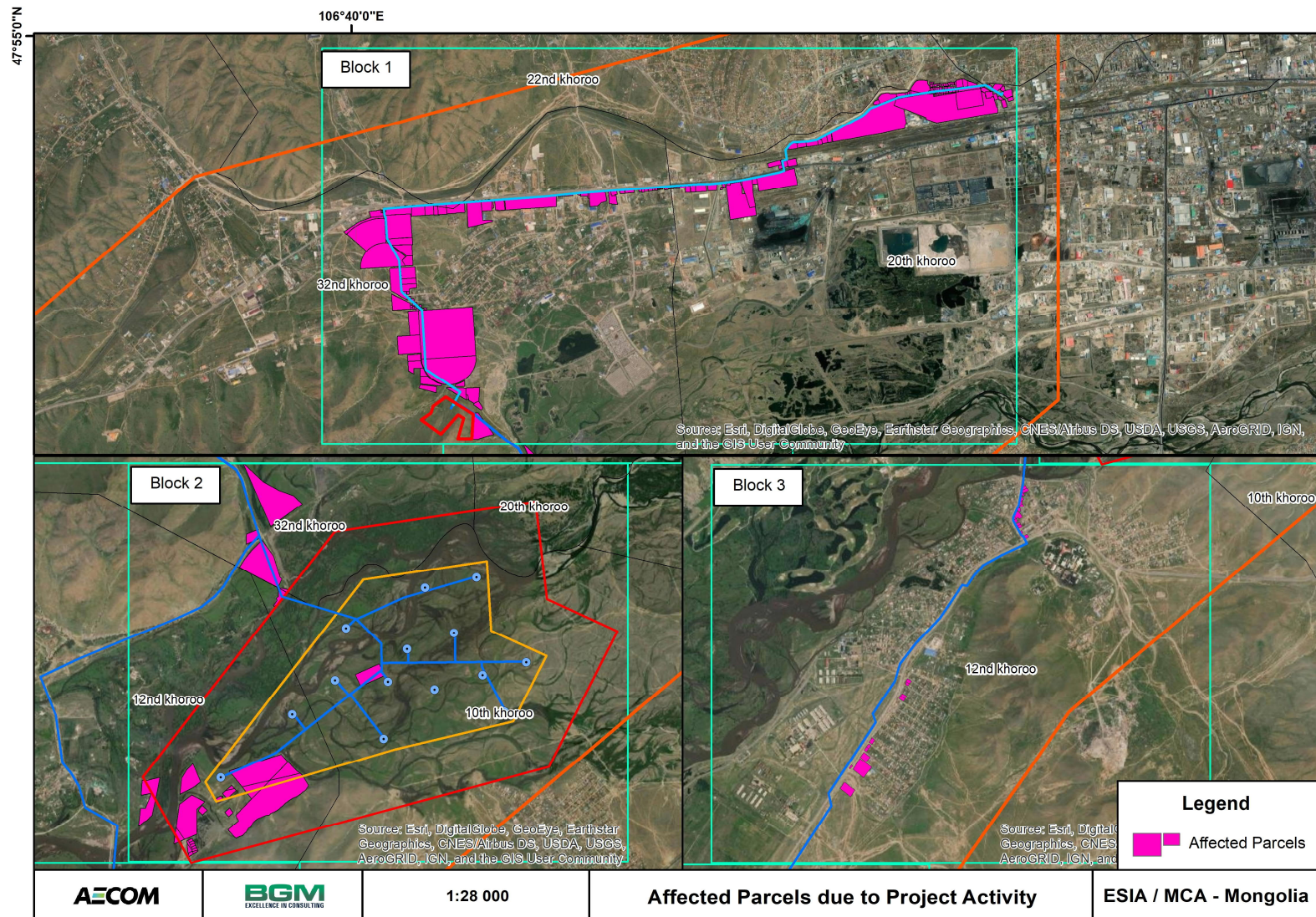
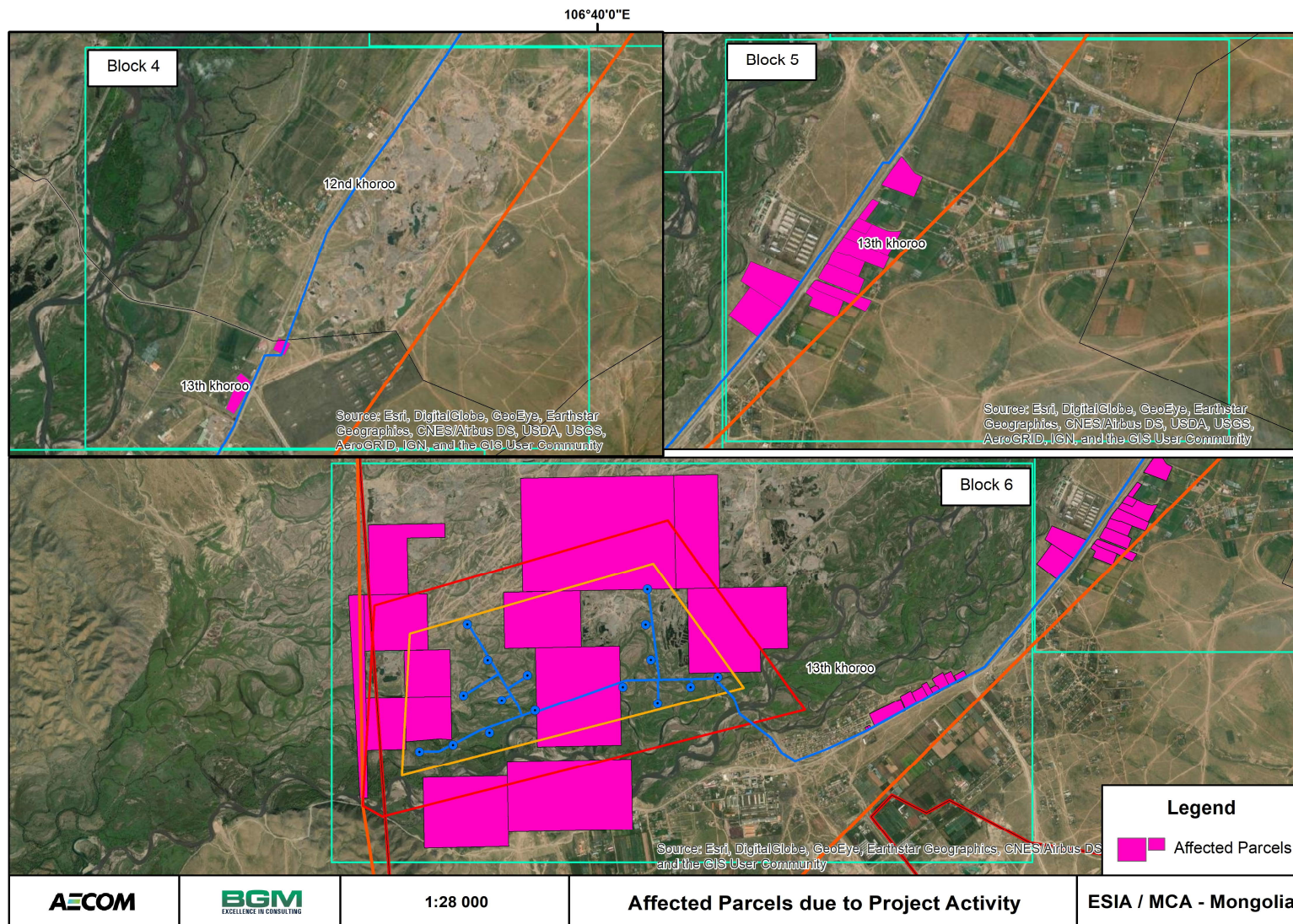


Figure 6-95 Affected Parcels due to the Project Activities.





**Figure 6-96 Affected Parcels due to the Project Activities.**

### 6.2.3 Migration

There is a flow of population moving out of the countryside for better opportunities in the cities ending up in the rapid urbanization of Mongolia. The urban migrants settle in the margins of the cities where land is available and yet with limited or no access to services and resources (International Organization for Migration, Mongolia 2018). The migration ban was introduced in 2017 and extended to 2020 by the Governor of UB (International Organization for Migration, Mongolia 2018).

The migration movement explains the expansion of the city while the migrant settlement location explains the difficulty this fraction of the population has to access socioeconomic services and resources. Some districts in the project area have a limitation on the availability of land (e.g., 10th district), whereas others such as the 12<sup>th</sup> district still offer land for distribution. According to secondary data, in 2018, 946 individuals moved to the Khan-Uul district while 914 moved out of the district. About 1070 individuals moved to the Songinokhairkhan district, whereas 1031 moved out of the district.

After the construction of the Buyant-Ukhaa apartment complexes (Khan-Uul district), there was a flow of new residents moving to the apartment complex and, thus, to the project area. The apartment residents are either from UB city or from the provinces. However, not all the occupants of these apartments live permanently in the community, or do they connect to the institutions and structures of the community. Qualitative data indicate that residents of the Buyant-Ukhaa apartment complex do not necessarily participate in the local community life as they work or study in UB city.

Livestock and herding are important economically and culturally in Mongolia. According to Resolution No. 85 of the Capital City Citizens' Representatives' Khural, dated 15 May 2015, dairy and beef cattle farming, chicken farming and pig farming, are allowed in the 12th, 13th, and 14th khoros of KhUD. The same resolution prohibits nomadic herding in all territories of the City and more intensive types of animal farming in other khoros. There are still cases of seasonal movements by herders who move in from the countryside or from the nearby territories (e.g., Altanbulag sum of Tuv Aimag province) to graze their livestock along the Tuul River during the summer, yet remaining outside of the livestock prohibited area as defined by Resolution No.85. Because of the, the project may have some impact on grazing in the 13<sup>th</sup> khoroo of KhUD, that is to say at the Shuvuun Wellfield.

There is no mention of population movement to the project area for work opportunities except when there is a major construction project (e.g., road construction), or the case of temporary workers at the gravel mining. Other workers commute to the area (e.g., the Chinggis Khaan International airport).

### 6.2.4 Survey Demography

According to the 2020 census, (National Statistical Office. 2020 Population and Housing Census of Bayan-Zurkh), Khan-Uul district had 187,300 residents, of which 93,503 women. The Songinokhairkhan district accounted for 327,600 residents, of which 162,862 women. Songinokhairkhan district has 93,521 households and Khan-Uul 51,241 households.

Total and female number of each khoroo in Aol is shown in Figure 6-97. Also, total and female-headed household numbers of khoros in Aol are shown in Figure 6-98.

The survey interviewed 159 households with 567 people – the area of influence of the project directly impacts affects a very small percentage of the population of these districts.

Table 6-44 and Table 6-45 present the demographic makeup of the survey sample. 46 surveyed households live in an area where they have to resettle due to the project implementation and 113 households locate in an area that has an indirect impact of the project. 29 percent of households surveyed are in the resettlement area and 71 percent in the affected project area, respectively. From surveyed households, 78 households are in Khan-Uul district and 81 households are in Songinokhaikhan district.

Interestingly these is a much higher proportion of women than men – 54.7 percent are female and 45.3 percent male. The national sex ratio for Mongolia (NSO) is 1.05:1 male: female at birth, the sex ratio of the survey population is 83 males per 100 females (0.83:1) which is remarkably low and probably reflects lower opportunities for women such that they more likely to only be able to afford living on the periphery. There is no real difference in the sex ratio between the resettlement area and the project area.

**Table 6-44 Individuals by Age Group and Sex**

	Number of people						Shares, %					
	0-5	6-16	17-18	19-60	61+	Total	0-5	6-16	17-18	19-60	61+	Total
<b>Surveyed population</b>												
<b>Male</b>	25	62	14	123	33	257	44.6	55.9	63.6	43.3	35.1	45.3
<b>Female</b>	31	49	8	161	61	310	55.4	44.1	36.4	56.7	64.9	54.7
<b>Total</b>	56	111	22	284	94	567	100.0	100.0	100.0	100.0	100.0	100.0
<b>Resettlement area</b>												
<b>Male</b>	7	16	7	40	10	80	50.0	53.3	77.8	42.1	32.3	44.7
<b>Female</b>	7	14	2	55	21	99	50.0	46.7	22.2	57.9	67.7	55.3
<b>Total</b>	14	30	9	95	31	179	100.0	100.0	100.0	100.0	100.0	100.0
<b>Project area</b>												
<b>Male</b>	18	46	7	83	23	177	42.9	56.8	53.8	43.9	36.5	45.6
<b>Female</b>	24	35	6	106	40	211	57.1	43.2	46.2	56.1	63.5	54.4
<b>Total</b>	42	81	13	189	63	388	100.0	100.0	100.0	100.0	100.0	100.0
<b>Source: Socioeconomic survey 2020 by AECOM and BGM.</b>												

Table 6-44 shows that 33.3 percent of the survey population is aged 0-18 years and 31 percent aged 0-16. The National Statistics Office Census material is available for 2010 with a new census timed to be carried out in October 2020. The World Population Review statistics for Mongolia 2020 <https://worldpopulationreview.com/countries/mongolia-population>, downloaded 07/10/2020) state that “The population of the country as a whole is relatively young, with the average age being 27.5 years. About 59 percent of Mongolia's residents are under the age of 30, while over a quarter of that population is under the age of 14. The young population, coupled with a growth rate of 1.31 percent, has put a strain on the country's economy.” The survey population data does not allow direct comparison but appears to be comparable. Average household size in the survey is 3.56 persons, the same as the national average. The survey households had an average size of 3.8 in male-headed households and 3 for female headed households.

According to the survey (Table 6-45), there are 54 households headed by a woman (34 percent of total households). In the resettlement area, 20 (43.5 percent) households are headed by a woman while this figure stands at 34 households (30.1 percent) in the project area. The highest proportion of female headed households are in Songinokhaikhan where 43 percent households are women headed. These figures are very much higher than the national figure of around 25 percent. (World Population Review statistics for Mongolia 2020) and reflect the availability and cost of accommodation in UB and lower earning power of employed women. This is developed further in the section on income and poverty, section 6.2.7 and 6.2.8.



**Table 6-45 Survey Households By Household Head Sex**

	Number of households					
	Household Total	Male	Female	Male %	Female %	Total %
<b>Surveyed population</b>						
<b>Resettlement Area</b>	46	26	20	56.5	43.5	100
<b>Project Area</b>	113	79	34	69.9	30.1	100
<b>Khan-Uul</b>	78	59	19	75.6	24.4	100100
<b>Songinokhairkhan</b>	81	46	35	56.8	43.6	
<b>Total</b>	159	105	54	66	34	100

The survey data on the status of household members shown in Table 6-48 which shows that 33 percent of the population is a child of which 76 percent are attending school, 37 percent are employed, 4 percent unemployed, 2 percent disabled and 18 percent are elders. The dependency ratio is 1:1.7 dependents, however the ratio is slightly higher in female headed households at 1:1.79 and lower for male headed households at 1:1.59. This means that working women have a slightly higher number of dependents than do employed men and support more than twice the number of elders than do employed men.



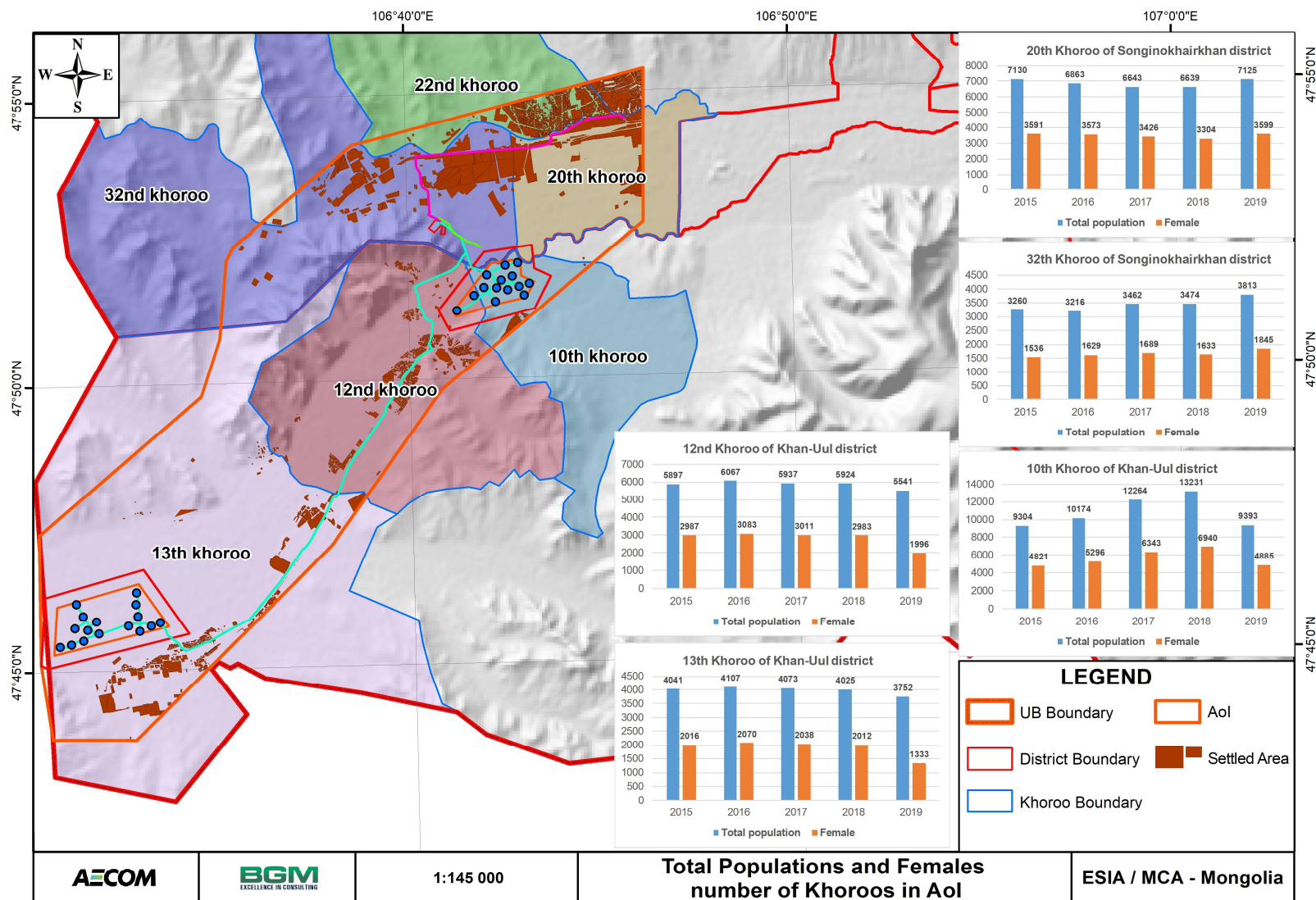


Figure 6-97 Total and Female Population Numbers of Khorooos

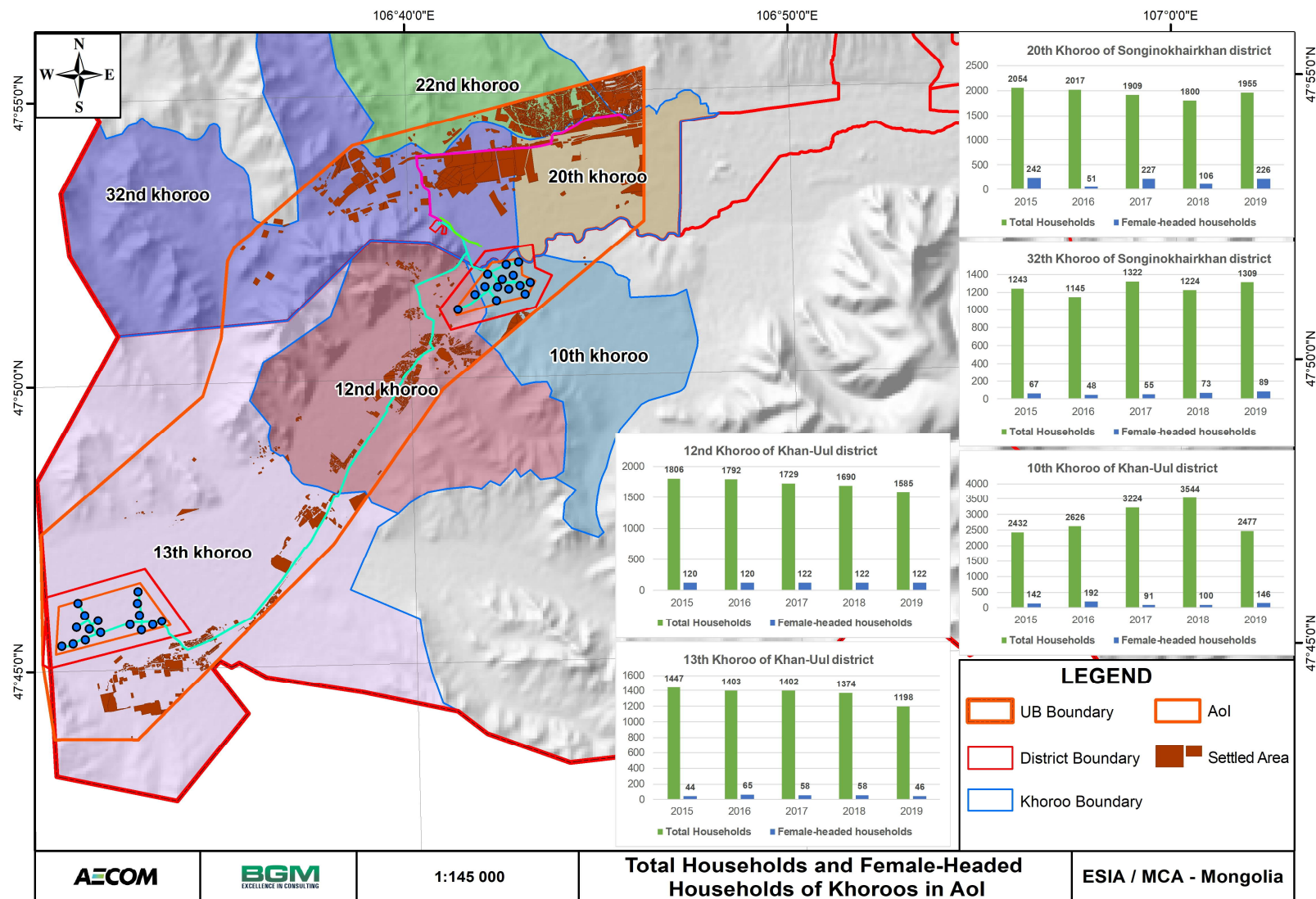


Figure 6-98 Total and Female-Headed Households Numbers of Khorooos



**Table 6-46 Survey Individuals by Demographic Indicators**

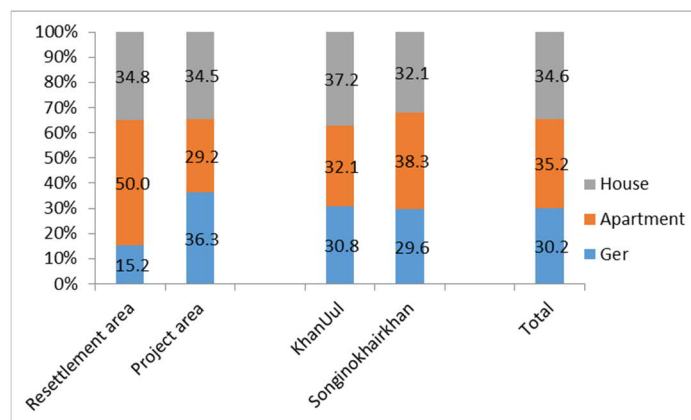
	Number of people							Shares, %						
	Population	Children	(School attendant)	Employed	Unemployed	Disability	Elder	Population	Children	School attendant	Employed	Unemployed	Disability	Elder
<b>Surveyed population</b>														
<b>Male</b>	257	101	(81)	99	13	7	35	45.3	53.4	56.3	47.1	54.2	53.8	34.0
<b>Female</b>	310	88	(63)	111	11	6	68	54.7	46.6	43.8	52.9	45.8	46.2	66.0
<b>Total</b>	567	189	(144)	210	24	13	103	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Resettlement area</b>														
<b>Male</b>	80	30	(23)	27	4	4	10	44.7	56.6	56.1	45.8	40.0	57.1	30.3
<b>Female</b>	99	23	(18)	32	6	3	23	55.3	43.4	43.9	54.2	60.0	42.9	69.7
<b>Total</b>	179	53	(41)	59	10	7	33	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Project area</b>														
<b>Male</b>	177	71	(58)	72	9	3	25	45.6	52.2	56.3	47.7	64.3	50.0	35.7
<b>Female</b>	211	65	(45)	79	5	3	45	54.4	47.8	43.7	52.3	35.7	50.0	64.3
<b>Total</b>	388	136	(103)	151	14	6	70	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Source: Socioeconomic survey 2020 by AECOM and BGM.</b>														

## 6.2.5 Assets

Residents own a variety of economic assets of which the land, the home, the business, and the herd are the most important. The majority of the residents own their homes and land (82.4 percent). Qualitative data indicate cases of residents who have settled in the area to look after a business plot. Such residents own the home (usually a Mongolian ger) and yet not the land. There is indication of families in transition. These are new migrants from the countryside who are in the process of land acquisition.

Financial assets invested in small businesses are valued but are uninsured and volatile. Economic assets include business assets such as a cars, minivans, grocery shops, car wash, or a car repair shop. A herding household owns an average of 79.3 livestock, of which 17.1 cattle, 17.5 sheep, 17.5 goats, 13.6 horses. In adverse situations, household members invest heavily in social assets as they set up networks of solidarity that allow them to channel available resources to the household. Social ties are an essential asset in the economic context of uncertainty. It is through these relations that people can exchange goods, receive services beyond market regulations.

Housing consists of detached houses, apartments and gers in the survey population in roughly the same proportions overall. There are fewer Gers in the resettlement area and more than twice the number in the project area.



**Figure 6-99 Shares of households by dwelling type, %**

According to the information in the Table 6-47, electricity is available to almost all dwellers (96.9 percent). Only 3 households used solar energy. Traditional heating systems are the most common type of heating (54.7 percent) followed by central heating systems (34.6 percent). In the resettlement area, most households have central heating system (56.5 percent) in the apartment blocks while households in the other project area have traditional heating (61.1 percent), which is more associated with Gers.



Table 6-47 Survey Households by electricity and heating source

	Electricity source				Heating source				
	Central	Solar	Other	Total	Tradition al heating	Private low- pressure boiler	Private electrical heater	Central system	Total
<b>Number of households</b>									
Resettlement area	46	0	0	46	18	1	1	26	46
Project area	108	3	2	113	69	9	6	29	113
Khan-Uul	74	3	1	78	46	7	3	22	78
Songinokhairkhan	80	0	1	81	41	3	4	33	81
<b>Total</b>	<b>154</b>	<b>3</b>	<b>2</b>	<b>159</b>	<b>87</b>	<b>10</b>	<b>7</b>	<b>55</b>	<b>159</b>
<b>Shares, %</b>									
Resettlement area	100.0	0.0	0.0	100.0	39.1	2.2	2.2	56.5	100.0
Project area	95.6	2.7	1.8	100.0	61.1	8.0	5.3	25.7	100.0
Khan-Uul	94.9	3.8	1.3	100.0	59.0	9.0	3.8	28.2	100.0
Songinokhairkhan	98.8	0.0	1.2	100.0	50.6	3.7	4.9	40.7	100.0
<b>Total</b>	<b>96.9</b>	<b>1.9</b>	<b>1.3</b>	<b>100.0</b>	<b>54.7</b>	<b>6.3</b>	<b>4.4</b>	<b>34.6</b>	<b>100.0</b>

Table 6-48 provides information on water sources by season. For all households, half of households consume water from public wells while one out of three household has access to a central distribution system.

Table 6-48 Households by water sources

	Winter and spring period						Summer and autumn period					
	Central	Public well	Private well	River	Other	Total	Central	Public well	Private well	River	Other	Total
<b>Number of households</b>												
Resettlement area	21	22	3	0	0	46	18	21	3	0	1	43
Project area	31	64	16	1	1	113	33	58	18	1	1	111
Khan-Uul	24	43	10	1	0	78	26	39	11	1	1	78
Songinokhairkhan	28	43	9	0	1	81	25	40	10	0	1	76
<b>Total</b>	<b>52</b>	<b>86</b>	<b>19</b>	<b>1</b>	<b>1</b>	<b>159</b>	<b>51</b>	<b>79</b>	<b>21</b>	<b>1</b>	<b>2</b>	<b>154</b>
<b>Shares, %</b>												
Resettlement area	45.7	47.8	6.5	0.0	0.0	100.0	41.9	48.8	7.0	0.0	2.3	100.0
Project area	27.4	56.6	14.2	0.9	0.9	100.0	29.7	52.3	16.2	0.9	0.9	100.0

<b>Khan-Uul</b>	30.8	55.1	12.8	1.3	0.0	100.0	33.3	50.0	14.1	1.3	1.3	100.0
<b>Songinokhairkhan</b>	34.6	53.1	11.1	0.0	1.2	100.0	32.9	52.6	13.2	0.0	1.3	100.0
<b>Total</b>	32.7	54.1	11.9	0.6	0.6	100.0	33.1	51.3	13.6	0.6	1.3	100.0

This pattern is the same in both winter/spring and summer/autumn season. There is considerable location bias because the availability of a central water system in apartment is far more common than in other types of dwelling. 45.7 percent of households in the resettlement area have a central water system compared to only 27.4 percent for households in the other project area.

## 6.2.6 Livelihoods

The majority of socioeconomic opportunities and entrepreneurship in the project areas are best described in the context of a survival economy and coping mechanisms in communities on the margins of the national economy. Economic initiatives in marginal areas are not sustained on a long-term basis whereby small businesses such as grocery shops, car repair shops, hair & beauty salons, spring up and close down regularly.

Economic and employment opportunities emerge when major projects, such as construction projects, are implemented in the area (e.g., New International Airport project, road construction...etc.). Qualitative survey data indicate cases of women looking for opportunities to operate food processing in the margins of a large construction project such as the BWSE.

Socioeconomic opportunities are gendered, with women taking initiatives in areas connected to their traditional domain of responsibility (e.g., food processing, beauty) or being in a secondary or support position in male owned enterprises (e.g., transportation). Male entrepreneurs operate car repair shops, transport, car wash.

Unemployment in the country stands high (NSO, 6.6 percent), and a good number of people make a living in the informal sector. Unemployment is disproportionately distributed between male and female and between male-headed households and female-headed households where unemployment is double that of male headed households. Unemployed women stay at home and perform the unpaid chores of home maintenance and child-rearing. The 2019 Labor Force Survey (NSO, 2020) reported that on average, working-age women spend 1.7 times more time than men on unpaid work, by region, women spend 2.2 times more time in urban areas and 1.5 times more time in rural areas compared with men. Working age women spend an average of 10.1 hours per week on cleaning, washing clothes, cooking the main meals, shopping for household necessities, and shopping, while unemployed women spend 10.9 hours per week.

The ongoing Covid-19 pandemic has impacted socioeconomic opportunities and entrepreneurship to an extent that has not yet been thoroughly evaluated.

Household members undertake a variety of activities to ensure survival, these include both formal and informal earnings and other nonmonetary opportunities of reciprocal support between households. These are listed in Table 6-44 and described in this section.

### 6.2.6.1 Employment

The wage economy is the primary source of household revenue. There are a few medium sized enterprises and businesses that employ residents of the project area. Major employers include Chinggis Khan international airport and adjacent services, the new Ulaanbaatar International Airport (under construction), the retail sector (e.g., The Hunnu Mall), Biokombinat. Government

employment in UB and at the district level offer stable employment and incomes. Some residents find work outside of the project area.

Medium size enterprises (e.g., leather tanneries, grocery shops) offer less stable jobs with limited benefits. There are usually owned by non-resident individuals. A few seasonal positions are available in the tourism and recreation industry (e.g., Songinokhairkhan district). However, there is strong competition for local residents in the local job market as UB residents commute to work at the airport, airport-related services, and other enterprises in the project area. Temporary workers from outside the project area also find employment at the gravel mining and construction project.

The wage economy has to be placed in the context of unemployment – 11 percent overall in the survey population (Table 6-46) compared with 6.3 percent (Mongolia Poverty Update 2018, Human Development Report UNDP 2020). Interestingly, the unemployment rate for men in the survey is highest at 13 percent compared to 9 percent for women.

The report of the 2019 Labor Force Survey (NSO, 2020) presents an overview of employment, under-employment and unemployment in Mongolia. The report underlines the fact that the status of employment in the survey area reflects the national picture. Nationally, there are 127.7 thousand unemployed persons who are looking for a job and willing to work. Moreover, there are 15.1 thousand in “time related underemployment”, who are employed part-time but willing to work for additional income and work overtime. Around 58.8 thousand persons were “potential labor force”, who are not classified as unemployed and employed but are marginally attached to the labor market and could potentially enter employment in the near future. Hence, more than 201.6 thousand persons at national level lack adequate access to paid work as such or are being denied the opportunity to work the desired number of hours.

The report underlines that access to paid work is no guarantee of decent work. The report states “All too often, the lack of income or other means of financial support compels workers to engage in jobs that are informal, offer low pay and provide little or no access to social protection and rights at work. At the national level, for the employed in the non-agriculture sector, 269.5 thousand employed (31.5%) were informally employed. In other words, three in every ten employed in the non-agricultural sector are in informal employment. In the non-agricultural sector, there are 160.8 thousand independent workers without employees, dependent contractors and contributing family workers. They are all in informal employment. In addition, three in every five short-term and casual employees in the non-agricultural sector are informally employed. These are especially those working on their own-account and contributing family workers, working in vulnerable conditions and earning a much lower income than people in wage and salaried employment.”

The report notes that of the total employed, 538.7 thousand (47.0%) were working excessive hours (more than 48 hours per week). The men working excessive hours (54.3%) were 15.5 percent higher than the women (38.8%). The Construction and Urban Development Sector Gender-Responsive Policy (2018-2025) document gives no further breakdown of employment by gender in the construction sector. The Labour Force Survey (2019) records nationally, 40,800 persons working in the construction industry in 2019. Of these 82.6% were male – 33,735 men and 17.4% - 7,064 women. However, the National Statistics Office online data search mechanism reveals that in 2019 there were 56,887 men and 11,961 women recorded as working in the construction industry (no identifiable reason for the difference is given). Of these 6,732 women are in the Ulaanbaatar area – 56% of all women working in construction in Mongolia. 60% of men working in the construction industry is Ulaanbaatar based.

### **6.2.6.2 Farming**

Vegetable farming and chicken farming is a permanent seasonal activity in the Khan-Uul district.

### **6.2.6.3 Herding**

Herding is the traditional livelihood system of Mongolia. Herding provides non-contractual employment while being a comprehensive livelihood system. Herding households make their living selling milk, cashmere, wool, sheep and goatskins, meat, and livestock sale. The Covid-19 pandemic has negatively impacted the supply chain in the herding related business as the international supply of cashmere, wool, and skins to countries such as China has been disrupted.

The development of herding in the project area conflicts with availability of residential land for new residents, availability of pasture lands, and the integration of herding in the country's economic structures. Herding is practiced in the project area, although at a small scale. Herders have either moved in from the countryside, or the project area is a seasonal settlement (e.g., along the Tuul River) for herders from the nearby countryside (e.g., Altan-Bulag sum of Tuv Aimag province).

In fact, according to Resolution No. 85 of the Capital City Citizens' Representatives' Khural, dated 15 May 2015, dairy and beef cattle farming, chicken farming and pig farming, are allowed in the 12th, 13th, and 14th khoros of KhUD. The same resolution prohibits traditional herding in all territories of the city and more intensive types of animal farming in other khoros, considered urbanized. There are still cases of herders who, ignoring the ban, move in from the countryside of the nearby territories (e.g., Altanbulag sum of Tuv Aimag province) to graze their livestock seasonally along the Tuul River and outside of the livestock prohibited area.

More intensive animal farming is allowed in the 13<sup>th</sup> khoroo of KhUD, where the Shuvuun Wellfield is located. In 2019 there were 12,871 heads of livestock in the 13th khoroo, supporting 271 families, that benefit from public pasture. Before Order No. 85 came into effect, there was an average of 8,000 animals grazing there, but these numbers have increased as animal farming has been pushed out of other khoros by the 2015 regulations – now pastureland in the 13th khoroo is reaching the grazing limit.

The project area in Songinokhairkhan affects areas that do not support animal farming.

### **6.2.6.4 Small Businesses**

Small local businesses include grocery shops, barbershops, hair & beauty salons, car repair shops, eateries, car wash, and transportation. There are 6,938 businesses registered in the Khan-Uul district and 6,825 businesses in Songinokhairkhan district (AECOM & BGM Socio-economic survey 2020). Some of the small businesses are owned and run by women yet aligning with the traditional gender-based labor division. Women own hair and beauty salons, sewing shops, eateries, and food processing activities.

Most small businesses offer no contractual employment with no benefits. Small businesses are not stable as they usually go bankrupt, while individuals form new ones to overcome economic adversity. Covid-19 negatively impacted small businesses in terms of a decrease in sales and a disruption of the supply chain. The global demand for raw cashmere decreased drastically while the government of Mongolia maintains the cashmere price at the same level as in 2019 (UNDP Rapid Socio-Economic Impact Assessment of Covid-19).

### **6.2.6.5 Quarry and Mining.**

Surface extraction of sand and gravel for construction projects is an activity in the Khan-Uul district. Mining companies hire temporary workers from outside the community. Mining companies'

owners are not from the district and may have no interest in the local community's socio development. Qualitative data (AECOM & BGM 2020) indicate that residents are instead looking forward to the eventual closure of the surface mining activities because of the negative impact on the environment.

#### **6.2.6.6 Allowances and Coping Mechanisms.**

Despite the existence of sustainable livelihood systems, there exist households that experience the hardship of poverty and unemployment. Vulnerable residents live on government allowances.



**Table 6-49 Survey Households by Economic Activity of the Household Head**

	Number of households						Shares, %					
	Paid job	Livestock	Agricultural business	Other business	No job	Total	Paid job	Livestock	Agricultural business	Other business	No job	Total
<b>All survey households</b>												
<b>Resettlement area</b>	20	1	1	3	21	46	43.5	2.2	2.2	6.5	45.7	100
<b>Project area</b>	45	11	4	12	41	113	39.8	9.7	3.5	10.6	36.3	100
<b>Total</b>	65	12	5	15	62	159	40.9	7.5	3.1	9.4	39	100
<b>Female-headed households</b>												
<b>Resettlement area</b>	11	0	0	0	9	20	55	0	0	0	45	100
<b>Project area</b>	13	1	0	2	18	34	38.2	2.9	0	5.9	52.9	100
<b>Total</b>	24	1	0	2	27	54	44.4	1.9	0	3.7	50	100
<b>Male-headed households</b>												
<b>Resettlement area</b>	9	1	1	3	12	36						
<b>Project area</b>	32	10	4	10	23	79						
<b>Total</b>	41	11	5	13	35	115						

Table 6-49 shows the distribution of economic activity by households and for male and female headed households. Female headed households (FHH) report only 1 herding family and none with agricultural businesses and only two with work in other businesses, male headed households (MHH) have a wider range of economic activities with herding, vegetable production and small businesses as well as wage employment. 50 percent of FHH have no job reflecting the fact that some FHH are led by (retired) elders – 61 years+.

**Table 6-50 Individuals by Business Sector**

	Livestock	Cropping	Other business
<b>Surveyed population</b>			
<b>Male</b>	11	6	19
<b>Female</b>	15	7	14
<b>Total</b>	26	13	33
<b>Resettlement area</b>			
<b>Male</b>	1	1	5
<b>Female</b>	1	2	3
<b>Total</b>	2	3	8
<b>Project area</b>			
<b>Male</b>	10	5	14
<b>Female</b>	14	5	11
<b>Total</b>	24	10	25

Table 6-50 shows the numbers of individuals by business activity. Of interest is the higher numbers of women than men working with livestock (but these are not in FHH) and the reverse in cropping – men working on vegetable and chicken farms are not heads of households, using comparison of the data in Table 6-50. A lower proportion of women are involved in small businesses than men.

## 6.2.7 Income

Table 6-51 shows the components of monthly household income reported by survey households. Total household income is highest in the project Area than that of the resettlement area households by 9 percent. Household incomes are slightly higher in Songinokhairkhan. Wages form the highest contribution to total income at around 60 percent followed by allowances 32 percent. Not all families have all components of monthly income in their individual incomes. FHH, as anticipatable, have lower contributions to monthly income from livestock but slightly higher agricultural income.

The most important comparison is between monthly income of FHH and that of all households. FHH have an average monthly household income of **only 69 percent** of that of all households whereas, MHH have an average monthly income almost twice as high as female-headed households and 19 percent higher than that of the total average. Allowances stand at 37.8 percent of total income for female-headed households, which is an indication that the poverty incidence is higher among female-headed households. This is discussed in the next subsection.

**Table 6-51 Monthly Household Income in the Project Area**

	Livestock income	Agricultural income	Other business	Wages	Allowances	Other	Total income	Average monthly per capita income
<b>Resettlement Area</b>	-	30,797.1	39,311.6	650,391.3	434,913.0	9,420.3	1,164,833.0	323,564.7
<b>Project Area</b>	29,594.4	6,636.7	25,958.7	814,584.1	397,893.8	32,264.0	1,306,932.0	363,036.7
<b>Khan-Uul</b>	42,873.9	9,401.7	32,265.0	855,641.0	339,025.6	35,256.4	1,314,464.0	365,128.9
<b>Songinokhairkhan</b>	-	17,694.9	27,469.1	681,802.5	475,604.9	16,409.5	1,218,981.0	338,605.8
<b>Female-Headed Households</b>	19,722.2	27,776.8	6,172.8	465,703.7	329,481.5	21,913.6	870,770.7	241,880.8
<b>Male-Headed Households</b>	21,706	6,349	41,984	922,076	449,295	27,579	1,468,990	419,711.0
<b>Total</b>	21,032.5	13,626.5	29,821.8	767,081.8	408,603.8	25,655.1	1,265,821.0	351,388.9

Nevertheless, 83 of surveyed households in the project area owe a debt of which 92.2 percent to a bank or a financial organization, and the remaining 7.8 percent include another form of debt as shown in Table 6-52. There is no difference in debt type or indebtedness between male and female-headed households

**Table 6-52 Households by Debt**

	Number of households			Shares, %		
	Bank, FO	Other	Total	Bank, FO	Other	Total
<b>Resettlement area</b>	22	2	24	91.7	8.3	100
<b>Project area</b>	61	5	66	92.4	7.6	100
<b>Khan-Uul</b>	48	4	52	92.3	7.7	100
<b>Songinokhairkhan</b>	35	3	38	92.1	7.9	100
<b>Male-Headed Households</b>	56	4	60	93.3	6.7	100
<b>Female-Headed Households</b>	27	3	30	93.3	6.7	100
<b>Total</b>	83	7	90	92.2	7.8	100

## 6.2.8 Poverty and Vulnerability

The National Poverty Survey, 2018 (NSO, 2018) found that the national poverty headcount ratio fell slightly from 29.6 percent in 2016 to 28.4 percent in 2018. Based on the 2018 Household Socio-Economic Survey, 28.4 percent of the total population lived under the 2020 official poverty line of 166,580 MNT per capita per month. In addition to the poor, a considerable size of the population is clustered just above the national poverty line: a further 14.9 percent of the total population, or 474.8 thousand people live between the poverty line and 1.25 times the poverty line in 2018. If any unanticipated shock hits, these vulnerable households could easily fall into poverty.

The Poverty Survey reports that high inflation, especially in food prices, negatively affected welfare of the urban poor but brought gains to rural herders who are net producers of livestock products. Since the consumption share of food is proportionally higher for poorer households, the recent increase in food prices affected urban poor residents relatively more as they purchase food items out of their own pockets. Consequently, poverty concentration is geographically growing in urban areas. The incidence of poverty is still higher in rural areas (30.8 percent) than in urban areas (27.2 percent), but the difference between urban and rural poverty rates has narrowed by 13 percentage points over time, from 15.8 percent in 2010 to 3.6 percent in 2018. With 66 percent of the population living in cities, more than six out of ten poor people (63.5 percent of all the poor) now live in urban areas, particularly in Ulaanbaatar and environs (41.8 percent).

The national assessment of poverty in Mongolia is based on the level of monthly per capita monetary income. The national standard is the Minimum Subsistence Level (MSL) which is officially announced each year by NSO of Mongolia. The MSL for 2020 is 230,000 MNT per capita per month. FHH have on average very little more income above the poverty level (Table 6-51). Table 6-53 breaks down the survey household population by those above and below the MSL. The data shows that 30.8 percent of households are in poverty with slightly higher incidence in the resettlement area. The survey shows that poor households have a higher average household size, 4.5 members, than non-poor households at 3.1 members.

**Table 6-53 Households by Poor and Non-poor**

Survey Households	Number of households			Shares, %		
	Non-poor	Poor	Total	Non-poor	Poor	Total
<b>Resettlement area</b>	31	15	46	67.4	32.6	100
<b>Project area</b>	79	34	113	69.9	30.1	100

Survey Households	Number of households			Shares, %		
	Non-poor	Poor	Total	Non-poor	Poor	Total
Khan-Uul	55	23	78	70.5	29.5	100
Songinokhaikhan	55	26	81	67.9	32.1	100
<b>Total</b>	110	49	159	69.2	30.8	100

Table 6-54 shows poverty incidence by gender – 38.5 percent of males are in poor households compared to 39.4 percent of females, not a significantly different proportion. However, male poverty status is highest in the resettlement area (45 percent) and lowest in the project area (35 percent). Female poverty is the same proportion in both areas at 39 percent.

**Table 6-54 Individuals by Poverty Status**

	Number of people			Shares, %		
	Non-poor	Poor	Total	Non-poor	Poor	Total
<b>Surveyed population</b>						
Male	158	99	257	45.7	44.8	45.3
Female	188	122	310	54.3	55.2	54.7
<b>Total</b>	346	221	567	100.0	100.0	100.0
<b>Resettlement area</b>						
Male	44	36	80	42.3	48.0	44.7
Female	60	39	99	57.7	52.0	55.3
<b>Total</b>	104	75	179	100.0	100.0	100.0
<b>Project area</b>						
Male	114	63	177	47.1	43.2	45.6
Female	128	83	211	52.9	56.8	54.4
<b>Total</b>	242	146	388	100.0	100.0	100.0

Table 6-55 shows a breakdown of monthly income for female headed households which shows a dramatic difference between that of poor and non-poor households. The average for non-poor households is only just above the MSL of 230,000 MNT.

**Table 6-55 Monthly Household Income per Female-Headed Household in the Project Area**

	Livestock income	Agricultural income	Other business	Wages	Allowances	Other	Total income	Average Monthly income per capita
<b>Income. MNT</b>								
Non-poor	31,323.5	44,116.2	-	566,558.8	334,058.8	34,803.9	1,010,861	280,794.7
Poor	-	-	16,666.7	294,250	321,700	-	632,616.7	175,726.9
<b>Total</b>	19,722.2	27,776.8	6,172.8	465,703.7	329,481.5	21,913.6	870,770.7	241,880.6
<b>Shares, %</b>								
Non-poor	3.1	4.4	-	56	33	3.4	100	
Poor	-	-	2.6	46.5	50.9		100	
<b>Total</b>	2.3	3.2	0.7	53.5	37.8	2.5	100	



**Table 6-56 Poor Households by Economic Activities**

Poor households	Number of households						Shares, %					
	Paid job	Herding	Agricultural business	Other business	No job	Total	Paid job	Herding	Agricultural business	Other business	No job	Total
<b>Resettlement area</b>	3	1	0	2	9	15	20	6.7	0	13.3	60	100
<b>Project area</b>	12	3	1	4	14	34	35.3	8.8	2.9	11.8	41.2	100
<b>Total</b>	15	4	1	6	23	49	30.6	8.2	2	12.2	46.9	100
<b>Female-headed and poor households</b>												
<b>Resettlement area</b>	1	0	0	0	4	5	20	0	0	0	80	100
<b>Project area</b>	5	0	0	1	9	15	33.3	0	0	6.7	60	100
<b>Total</b>	6	0	0	1	13	20	30	0	0	5	65	100
<b>Male-headed and poor households</b>												
<b>Resettlement area</b>	9	1	1	3	12	26	34.7	3.8	3.8	11.5	46.1	100
<b>Project area</b>	32	10	4	10	23	79	40.5	12.6	5.0	12.6	29.1	100
	41	11	5	13	35	105	75.2	16.6	8.8	24.1	75.2	100

**Table 6-56** looks at contributions to average monthly income per capita for poor households and for FHH. Poor households tend to have fewer households with paid employment (30.6 percent) and higher levels of unemployment (47 percent). In FHH, this trend is even greater with 65 percent unemployment, rising to 80 percent in FHH in the resettlement area. This has important implications for protection of livelihoods in households affected by resettlement who will need distinct livelihood interventions to prevent increasing poverty.

Poor households need to gain income from all sources and household members – the incidence of child labor was only found in poor households, 41 out of 49 poor households classified as poor report sending children to work. There is no real difference in the incidence of child labor between MHH and FHH or between the two project areas (see Table 6-57).

**Table 6-57 Poor Households by Head Gender**

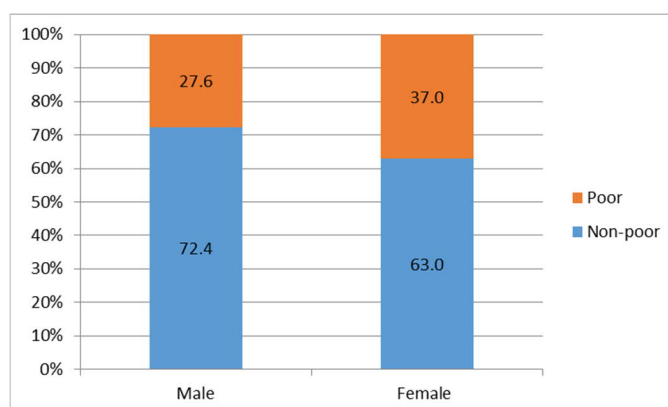
	Poor households			Poor households with child labor		
	Male	Female	Total	Male	Female	Total
<b>Number of households</b>						
<b>Resettlement area</b>	10	5	15	9	5	14
<b>Project area</b>	19	15	34	15	12	27
<b>Total</b>	29	20	49	24	17	41

Vulnerability is defined as the potential to heightened negative reactions from project impacts. The more vulnerable a household is, the greater the likelihood that the household will be unable to survive economic, physical and social shocks such as resettlement, changes in livelihoods and the difficulties of relocation.

Vulnerability is characterized by poverty with additional social parameters known to be found more commonly in vulnerable households. These are:

- Low incomes,
- Unemployment
- Belonging to female headed households,
- Being disabled or elderly, and
- Child labor.

Whilst the BWSE project presents an opportunity for the residents, businesses, and industries in the city of UB, some sections of the population may be negatively affected by the BWSE project implementation. The poor section of the population below the MSL constitute a particularly vulnerable group with 10 percent more poor FHH than MFF (see Figure 6-88).



**Figure 6-100 Household Vulnerability by Sex-Disaggregation**

Women and children constitute a vulnerable group because of their social status, age, and gender. Traditionally, women in Mongolia occupy a secondary position, usually under the protection either of a father or a husband. Since democratization, women have made a great effort, with the government enhancing the legal and policy framework, to improve their position in society.

Women often become household heads as a result of death or divorce and become responsible for the family. FHH form 34 percent of households in the survey population, have 30 percent less income than MHH, are 10 percent more likely to be poor, have higher levels of unemployment, have fewer income earning opportunities, have higher numbers of dependents, and more elderly household members. FHH are therefore considered vulnerable.

During the qualitative research, community members pointed out that children as a vulnerable group that may be significantly affected during the project construction. Children, especially children of poorer households, are vulnerable to child labor, poorer educational opportunities, increased disease, trafficking, harassment, and exploitation (including sexual exploitation). The safety of the children during construction is a concern for community members.

The unemployed make another vulnerable group who are at risk of increased poverty.

New migrants in the process of integration constitute a vulnerable group. Despite the GoM prohibition of migration, there is still an influx of migrants to UB city in search of life opportunities. This group is vulnerable as they have to locate on the periphery with reduced access to services and are more likely to work in the unregulated informal sector which often has unfair job offers and low remuneration.

Temporary and foreign workers are vulnerable as they may be victims of trafficking in persons, unfair working conditions, and poor treatment. Worker camps may present an ideal situation of trafficking in persons, exploitation, and abuses.

The project will protect vulnerable groups through a Vulnerable People's Plan to ensure that negative project impacts do not fall on these groups and that mitigation measures are in place to assist these groups to manage the project impacts.

## **6.2.9 Community**

### **6.2.9.1 Health**

According to the World Bank estimation, Mongolia has accumulated improvements in access to basic health (World Bank, systematic country diagnosis, Mongolia 2018). The country's Health Sector Strategic Master Plan (HSSMP 2019-2014) guides the sector with a focus on primary healthcare. There are family clinics in each district providing primary health services to the residents. However, there has been a demographic pressure to the point of overwhelming the clinic's capacity. Meanwhile, family clinics have not seen an increase in their resources, which has impacted on service quality.

Not all the population living in the project area have access to the family clinic. Reasons vary between accessibility and paperwork as residents need to be registered with their respective districts to access services. New residents may not be reregistered to any district family clinics, while some residents consider family clinic services as inefficient.

Sanitation in the project area is considered poor. Drinking water quality is not good. Only a few residents (those living in apartment complexes) have direct access to potable water. Residents who live in the traditional Mongolian Ger fetch water from a water collection center (see Table 6-58).

Qualitative research mentioned recurrent seasonal diseases such as gastrointestinal diseases in the summer, respiratory infections in the winter. Other diseases endemic to the community include skin disease, cardiovascular diseases, cancer, high blood pressure, hepatitis B, and C virus. There are no reliable data to measure the severity of these endemic health conditions. Family clinic practitioners blame the surge in respiratory diseases on air pollution.

Table 6-58 Households by Water Sources

	Winter and spring period						Summer and autumn period					
	Central	Public well	Private well	River	Other	Total	Central	Public well	Private well	River	Other	Total
<b>Number of households</b>												
<b>Resettlement area</b>	21	22	3	0	0	46	18	21	3	0	1	43
<b>Project area</b>	31	64	16	1	1	113	33	58	18	1	1	111
<b>Khan-Uul</b>	24	43	10	1	0	78	26	39	11	1	1	78
<b>Songinokhairkhan</b>	28	43	9	0	1	81	25	40	10	0	1	76
<b>Total</b>	52	86	19	1	1	159	51	79	21	1	2	154
<b>Shares, %</b>												
<b>Resettlement area</b>	45.7	47.8	6.5	0	0	100	41.9	48.8	7	0	2.3	100
<b>Project area</b>	27.4	56.6	14.2	0.9	0.9	100	29.7	52.3	16.2	0.9	0.9	100
<b>Khan-Uul</b>	30.8	55.1	12.8	1.3	0	100	33.3	50	14.1	1.3	1.3	100
<b>Songinokhairkhan</b>	34.6	53.1	11.1	0	1.2	100	32.9	52.6	13.2	0	1.3	100
<b>Total</b>	32.7	54.1	11.9	0.6	0.6	100	33.1	51.3	13.6	0.6	1.3	100

Information on the incidence of HIV/AIDS from 2009-2018 inclusive (NSO, 2019) has only 219 registered cases, varying from 13 to 31 cases per year. Incidence is overwhelmingly male—87 percent of cases recorded were from men. There is no evidence to prove that in Mongolia, as in other locations, HIV/AIDS incidence rises with migrant and mobile male labor and women are likely to be infected by these men.

#### 6.2.9.2 COVID-19 impact on the community's existing conditions

COVID-19 has severely impacted the existing conditions in the project area. The National Statistics Office of Mongolia (NSO) and the World Bank have implemented a joint COVID-19 Household Response Phone Survey to monitor the effect of the pandemic on the national community. The UNDP has as well conducted a rapid assessment of the impacts of COVID-19. To date, Mongolia has experienced no deaths related to COVID-19 (ref <https://coronavirus.jhu.edu/map.html> John Hopkins).

The ongoing pandemic has altered the socioeconomic and gender conditions to the extent that there is no guarantee that the re-opening of the economy and the country will encourage reversion to the previous conditions. According to the World Bank, the UNDP, and the GoM, businesses experienced a decrease in sales and income due to the disruption of the supply chain. Household income has decreased as a consequence of the loss of wage income, decline in family-own business (agriculture, herding), or job loss. Communities across the country experience a certain level of food insecurity, while food may be beyond affordability due to the increase in price meaning a rise in poverty. COVID-19 has affected communities in the project area as it has for other people around the country.

#### 6.2.9.3 Schools

Public education in Mongolia is free with primary and lower secondary levels of education compulsory (Article 16 of the 1992 Constitution of Mongolia). This has resulted in almost universal literacy in Mongolia with 99.3 percent of over 15 years of age in urban areas literate and 97.6 percent in rural areas in 2019, according to the National Statistical Office 2020 Population and Housing Census. The national census records higher levels of educational achievement for women in urban areas.

There are 65 schools in both Khan-Uul and Songinokhairkhan districts. All children in the project area have access to school and the education system. However, because of sustained internal migration, some schools have demographic pressure and are not able to admit all school-age

children. New migrants who settle in the fringe of the community may experience limited access to the school system. Of 189 Children surveyed in the project area, only 144 attend school.

In the khoroo 11 of the Khan-Uul district (Morin Davaa), the school capacity has been long exceeded, and the school is running three shifts to accommodate all the school-age children.

#### **6.2.9.4 Community Security and Safety**

Both qualitative and quantitative research for the ESIA mention incidents of home burglary and petty theft. However, 78.6 percent of households report getting along with each other while describing their community as peaceful. Residents compare the serenity of their community to the turmoil of the city.

There are police stations across the project area, Songinokhairkhan district has three Police Departments and Khan-Uul two, residents mentioned having access to police protection. Nevertheless, residents in the fringe of the community do not always have immediate police protection. The police report 3,470 crimes in Songinokhairkhan district in 2019 and 2055 crimes in Khan Uul district. Of these there were 58 incidences of rape and 19 reports of domestic violence in Songinokhairkhan district and 17 cases of rape and 6 incidences of domestic violence in Khan Uul. There are no immediately identifiable statistics for crimes committed by foreign workers.

Since the construction of paved roads in both the Khan-Uul and Songinokhairkhan districts, there have been more than a few traffic accidents due to unregulated traffic and dysfunctional road signs. Residents also mention the case of an accident at the Tuul river during the summer, where children spend time playing in the river water.

#### **6.2.10 Cultural Heritage**

The landscape across the project area is not neutral as people of Mongolia believe spiritual entities inhabited the land and the waters. Therefore, the land is sacred, which the people request from Mother Earth before they use any portion of it to build an abode or a burial. The sacredness of the landscape is expressed in the names of the places across the project area such as Khan-Uul and Songinokhairkhan.

The Songinokhairkhan mountain is one of the four sacred mountains around UB city. The mountain is a tangible cultural heritage and an object of worship by the local community and beyond. Worship activities are scheduled every four years. Religious practices connected to the worship of the mountain spirits are an intangible cultural heritage of the Mongol people. The project must ensure that due respect is accorded to the mountain by not encroaching in any way on the mountain itself, by preventing contractors from abusing the environment around the mountain and facilitating local ritual by contacting religious and spiritual leaders and maintaining such dialogue throughout the project. This will be enforced through conditions of contract and inspection and supervision by MCA-Mongolia or its representative's team.

There are other places of spiritual significance (e.g., collective memory) across the project area where the local the population believes spirits of the land and water reside (e.g., the ovoo). These are valuable cultural resources and heritage. The MCA-Mongolia or its representative's Social Manager will be responsible for monitoring project activity and for liaison with religious and spiritual leaders to ensure no encroachment or irreligious acts. There are 18 temples in the Khan-Uul district.

#### **6.2.11 Archaeological and Paleontological Survey**

There are four archaeological objects documented by the archaeological field survey in the Songinokhairkhan district, including two khirgisuur monument of the Bronze Age and two



Medieval Period burials (see Appendix E). These objects are located in 100 meters south from the planned area of the water supply system. The archaeological survey discovered 12 new archaeological sites in the Songinokhairkhan district, including five khirgisuur monuments from the Bronze Age and seven ancient burials. The survey did not reveal any underground archaeological site (see Appendix E). Nevertheless, the researchers do not exclude the eventuality of finding objects of archaeological significance during construction.

The archaeological sites are protected from interference or disturbance by the project through requirements incorporated into the contracts for construction and by Mongolian law. The Chance Finds Protocol dictates how archaeological finds will be dealt with and protected from damage immediately on discovery. The requirement to protect and respect the existing monuments near to the project area and any newly discovered sites and the use of the Chance Finds Protocol will be required in all conditions of contract.

The archaeological objects constitute a significant cultural heritage of the Mongol historical memory (see Figure 6-101 and Figure 6-102).

### **6.2.12 IFC PS 8 Cultural Heritage**

Performance Standard 8 recognizes the importance of cultural heritage for current and future generations and aims to protect irreplaceable cultural heritage. Cultural heritage refers to tangible forms of cultural heritage, such as sites having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values, as well as unique natural environmental features that embody cultural values, such as a sacred tree or mountain as found in the project area. In accordance with the performance standard, critical cultural heritage comprises the internationally recognized heritage of communities who use, or have used within living memory, the cultural heritage for long-standing cultural purposes; and legally protected cultural heritage areas, including those proposed by host governments for such designation. Although spiritually and culturally important, the known spiritual landscapes and cultural heritage in the project area are not considered critical cultural heritage, as they have neither the international recognition nor the legal protection specified in IFC PS 8.

The performance standard requires the project to investigate and research any cultural heritage sites so as to identify their importance and design the project to avoid the sites. Archaeological and cultural heritage research has been undertaken to identify all sites in the project area and the design modified to avoid all impacts on any particular site. No site needs to be relocated or destroyed. Full consultation with the district and khoroo authorities was undertaken to ensure complete understanding and respect.

The project has a Chance Finds Procedure compliant with IFC PS 8, see Section 11. Each contractor or partner organization is required to include the procedure in the Contractors Environmental and Social Management Plan and to include education about the use and importance of the procedure in employee training.

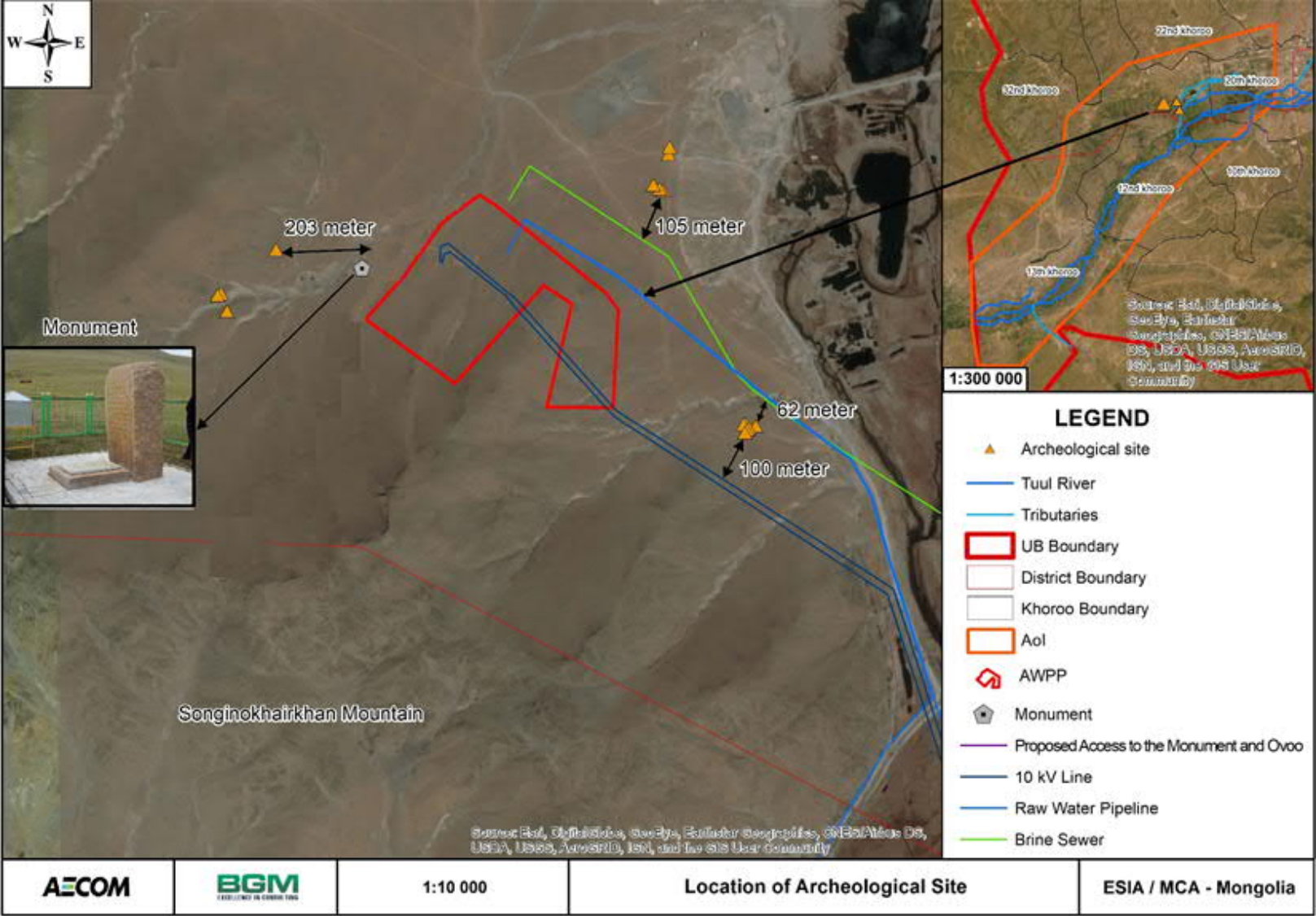


Figure 6-101 Location of Archeological Sites



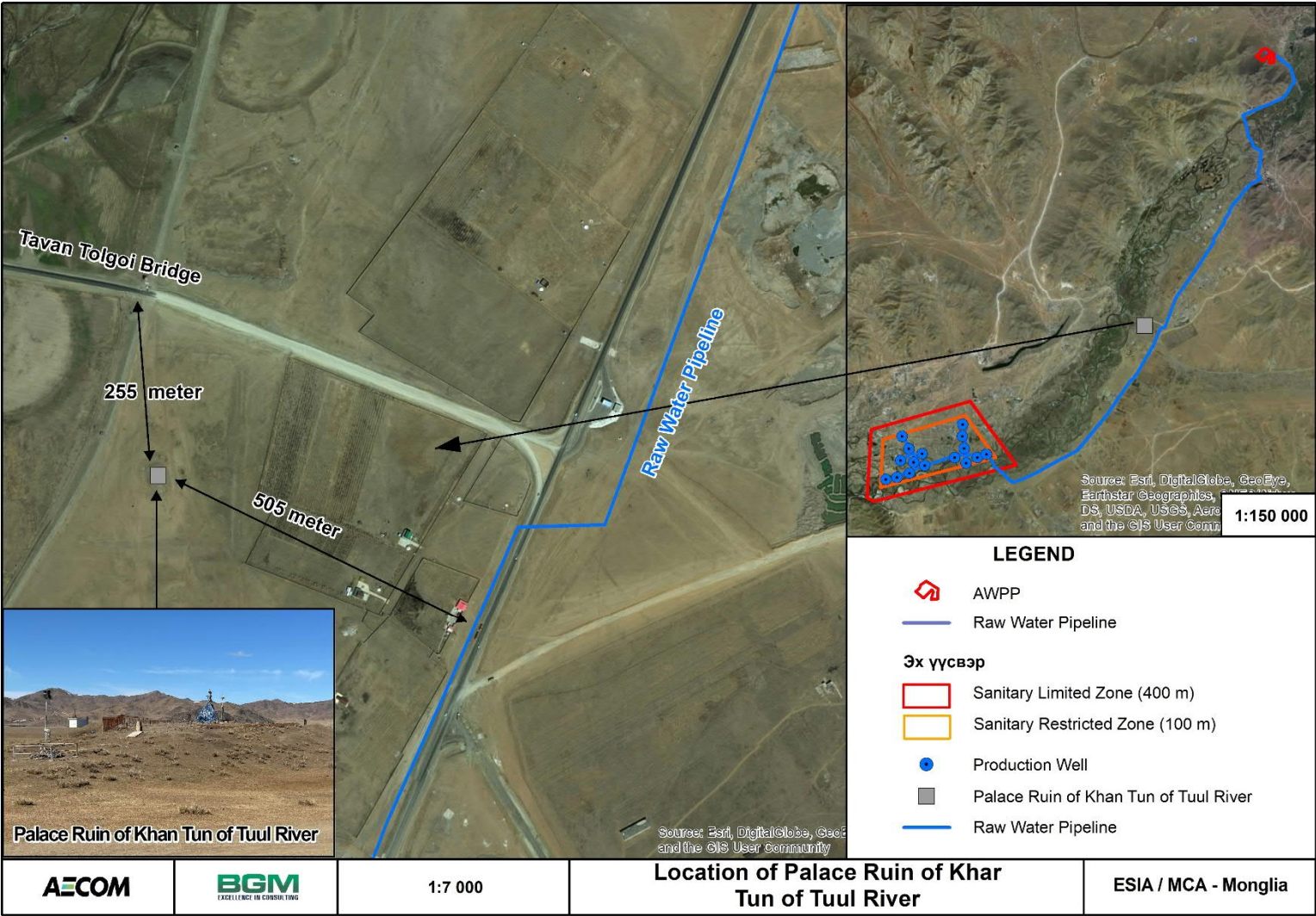


Figure 6-102 Location of the Palace Ruin of Khar Tun

## 6.2.13 Human rights

The UN considers the rights inherent to all human beings regardless of their race, gender, ethnicity, nationality, and language as Human Rights. Human Rights broadly include economic, social, and cultural rights, along with civil and political rights (UDHR 1948). Mongolia has ratified a number of international human rights treaties: International Covenant on Economic, Social and Cultural Rights 1974, Convention on the elimination of all forms of discrimination against women 1981F.

Since the country's democratization in 1990, the Government of Mongolia has striven to strengthen the country's human rights records through legislation and policies as guaranteed in chapter two of the 1992 Constitution. In 2000, Mongolia adopted the law on the National Human Rights Commission with a mandate to promote and protect human rights and freedoms provided in the Constitution, the laws, the policies, and international treaties ratified by Mongolia.

Mongolian leaders have worked hard to mitigate social risks and promote gender equality. In 2005, the Parliament of Mongolia adopted the Millennium Development Goals to reduce social risks and improve gender equality to foster human development. The Millennium Development Goals became the base for a Comprehensive National Development Strategy (CNDS 2008-21). Further, Mongolia has witnessed significant economic growth in recent years because of the mineral boom. However, such economic growth has not necessarily aligned with social progress. All sections of the population did not enjoy the benefits of economic development. Such is the case for most residents of the "ger district."

Qualitative data and socioeconomic survey conducted by AECOM and BGM (2020) did not indicate significant incidences of human rights abuse (e.g., restriction of freedom, torture, trafficking in persons, gender-based violence, sexual harassment...etc.). However, due to the overall human rights record of the country (US Department of State: Mongolia 2019 Human Rights Report, AI Mongolia 2019) and the particular context of the "ger district" (Terbish and Rawsthorne 2016, Plueckhahn & Terbish 2018), it is not possible to dismiss the potential incidents of human right abuses in the communities impacted by the project.

As evidenced in the socioeconomic survey (AECOM & BGM, 2020), there are limited resources and social and economic opportunities in these communities, which create a challenging social environment. The challenges are low wages, job insecurity, alcohol abuse, domestic violence, limited access to safe drinking water, and lack of access to the education system for newly arrived migrant children, sexual harassment, limited opportunities for women as well as gender-based discrimination in employment. These factors create difficulties for affected persons.

It is the worldwide context of these difficulties that the MCC has issued Policies for its projects on Gender and Social Inclusion and on Countering Trafficking in Persons and requires these policies to be incorporated into project design and implementation. The following sections will look at each policy and then look at the situation in Mongolia. Ways of improving these issues through the project are presented in Section 11.

### 6.2.13.1 Gender Issues in the Project Area

With the economic crisis of the 1990s, many men had a hard time finding work, and women have since taken upon themselves the responsibility of locating the necessary resources to sustain their households. Women work in both the formal and informal economy to take care of their traditional responsibility in the home. In the project area, women work in the informal sector, organize coping mechanisms and survival activities.

Mongolia has an increasing number of women heads of the households and women were integrated into the workforce during the socialist era. However, women and men face different

obstacles on the job market based on their gender and there is a gap in income between a man and a woman (Mongolia Gender assessment ADB 2005, World Bank Perceptions of Precariousness 2018)

Nevertheless, the general situation is that despite a high level of educational attainment. Nationally, women in Mongolia earn an average of 85 percent of men's wages – in the project area this is as low as 69 percent. Mongolian women are often engaged in less well-paid professions irrespective of their competencies, they tend to occupy lower ranks than men in the job hierarchy, both in the public and private sectors. Women in the communities impacted by the project are aware they get less paid than their male counterparts for the same job. The wage gap is a recurrent issue in Mongolia.

Mongolian women spend double the time of men on household and care duties. The lack of social support systems for unpaid family responsibilities exacerbates the problem forcing women to choose between employment and care or to carry a double burden. Such a situation impacts women's participation in productive jobs and high-growth sectors in the economy and has implications for their career progression, pensions, and overall well-being. (UN Mongolia: End Disparity - Promote Equality, 2016).

Qualitative data was not collected on gender-based violence, domestic violence, and sexual harassment for this survey as data collection process in groups precluded confidentiality. Nevertheless, the survey found that women in the communities are engaged in the promotion of gender equality at the local institutional level.

The survey data on the situation of women in the project area has been discussed throughout section 6.2 and the gender implications in the data highlighted. Women in the project area earn less, have lower incomes and opportunities to work, have a higher proportion of female headed households and have higher numbers of dependents than male headed households.

The gendered division of labor and limited opportunities for women display a society wherein women compete with their male partner over resources, with the women having the traditional responsibility to take care of the home and the children. Instances of domestic violence are regularly reported to the police and is often related to alcohol abuse. Alcoholism and unemployment remain the major social issues in the project area.

#### **6.2.13.2 Gender-Based Violence and Sexual Harassment**

In some districts (e.g., 10<sup>th</sup> khoroo), the local administration has set up a committee to follow up on cases of domestic violence and gender-based violence. Domestic Violence is caused by both partners, gender-based violence is violence directed against a person because of their gender. Both women and men experience gender-based violence but the majority of victims are women and girls. There are a few cases of abuse to children that were reported (2 to 3 in a year, 10<sup>th</sup> district, police statistics) but more cases related to domestic violence and sexual harassment and alcohol abuse. There is an indication of unreported cases of domestic violence.

The Songinokhairkhan district reported 58 cases of rape in 2019, and the Khan-Uul district reported 17. There is a lack of reliable and adequate information and data related to gender-based violence and sexual harassment at khoroo level in both districts. The key informants' interviews with social workers, police officers, and teachers of the affected khoroo in Khan-Uul and Songinokhairkhan districts found that there have been reported cases of violence against women, triggered mainly by alcoholism followed by poverty and unemployment. No data was found on recorded victims of sexual harassment in both districts, which may indicate lack of recording rather than lack of the crime.



### 6.2.13.3 Social Conflict and Social Inclusion

The Aol community configuration includes a variety of ethnic groups that can be broadly described as follows:

- Households who used to own assets and were integrated into the national economy, and yet failed to make the transition during the economic crisis of the 90'. They moved to the outskirts of the city where land and housing were accessible.
- Households who were part of the social housing for major enterprises (e.g., Biokombinat) and who have lost their jobs and assets following the enterprise bankruptcy.
- Households who were part of the agriculture cooperatives and presently own the chicken farms or work for the new private owners.
- Poor households who lost their assets in the herding economy and moved from the countryside to settle in the fringe of the city with limited economic opportunities and skills.
- Newcomer households of herders who recently arrived from the countryside and still own limited assets in livestock either in the community or which they left behind in the countryside.

These different groups have no open conflicts between themselves and have integrated into their new community through social networks and social relations of solidarity necessary for survival. Nevertheless, access to resources in the community divides the households into those who have and those who have not.

Where there are scarce resources, there is competition and conflicts of resources. Regular conflicts emerge around water and land resources (see Table 6-59). 74 percent of households report no conflicts but of the remaining 26 percent, most record conflict arising very often, mostly in the wider project area of influence not the resettlement area. On closer analysis of the data, conflicts are more likely to arise over land than for water but that there is no difference in experience of conflict between male and female headed households.

**Table 6-59 Households by Conflict**

	Conflict related to water					Conflict related to land				
	None	Very often	Regularly	No answer	Total	None	Very often	Regularly	No answer	Total
<b>Number of households</b>										
<b>Resettlement area</b>	42	3	0	1	46	26	16	0	4	46
<b>Project area</b>	75	24	14	0	113	73	36	1	3	113
<b>Khan-Uul</b>	46	20	12	0	78	50	26	1	1	78
<b>Songinokhairkhan</b>	71	7	2	1	81	49	26	0	6	81
<b>Total</b>	117	27	14	1	159	99	52	1	7	159
<b>Shares, %</b>										
<b>Resettlement area</b>	91.3	6.5	0	2.2	100	56.5	34.8	0	8.7	100
<b>Project area</b>	66.4	21.2	12.4	0	100	64.6	31.9	0.9	2.7	100
<b>Khan-Uul</b>	59	25.6	15.4	0	100	64.1	33.3	1.3	1.3	100
<b>Songinokhairkhan</b>	87.7	8.6	2.5	1.2	100	60.5	32.1	0	7.4	100
<b>Total</b>	73.6	17	8.8	0.6	100	62.3	32.7	0.6	4.4	100

### 6.2.13.4 Trafficking persons in Mongolia

The research did not find cases of gender-based forced labor. There was repeated mention of gender-based violence and domestic violence yet not of gender-based forced labor. The local police monitor incidences of forced labor, women trafficking, and prostitution as they are prohibited by the Mongolian Labor Law (1999).

However, incidents of women and even female children forced into prostitution exist, especially in the tourism industry and mining (Asia Foundation 2018).

In 2019, the Songinokhairkhan district reported 3 cases of human trafficking and 2 cases of sexual exploitation, whereas the Khan-Uul district reported none. The incidence of women trafficking and prostitution both on the domestic and international levels are frequent in Mongolia (Asia Foundation 2018). According to the 2017 US Department of State's Trafficking in Persons (TIP) Report, Mongolia is a Tier 2 country, which means that "the country does not fully meet the minimum standards articulated in the Trafficking Victims Protection Act (TVPA) but is making significant efforts to come into compliance with those standards." In 2019, the Songinokhairkhan district reported 3 cases of human trafficking and 2 cases of sexual exploitation, whereas the Khan-Uul district reported none. (2020 National Statistics Office, Crime Records).

Although residents interviewed in the project area did not refer to any direct incident of women trafficking and prostitution, yet they were aware of both domestic and international practices that are sometimes presented to young women as opportunities (AECOM & BGM survey 2020). Mongolia is both a source and a destination of trafficking in persons. Frequent incidents of trafficking and prostitution occur at the China-Mongolian border (Zamiin-Uud), mining sites, construction sites, Beijing, Macau, Hong Kong, and South Korea. Trafficked women are used in sexual exploitation as well as prostitution in bars, saunas, massage parlors, and night clubs. Statistics from the Mongolian Gender Equality Center show an increasing number of victims of sexual exploitation as follows: 11 in 2006, 42 in 2007, 27 in 2008, 51 in 2009, and 81 in 2010. Sexual exploitation and prostitution increase women's vulnerability to sexually transmissible diseases. Related to women trafficking is the sexual exploitation of children, which is prohibited by provision 115 of the Mongolian criminal law. Incidents of child sex tourism exist, and the project area may be vulnerable to such events.

#### **6.2.13.5 Child Labor and Forced Labor**

According to the ILO (June 2016), 10 percent of Mongolian children aged 5 to 17 (over 56,000 children) perform child labor, particularly in the agriculture sector, but also in the forms of horse racing, construction, and mining. The labor law of Mongolia prohibits children under 16 years old to work. Research data collected in the project area does not mention instances of forced child labor. Informants in the project area indicate that household members may request their children to work to supplement the family income. 78.6 percent of surveyed households allow their children to work. Out of 49 vulnerable households, 41 (or 83.7 percent) report sending their children to work. The IFC PS 2 insists on the respect of local labor law and the protection of vulnerable categories of workers, including children, through offering them safe working conditions. It is important to mention a tradition of child jockey in the country, and some of the children from the project area participate in horse racing. There have been accidents, and the government of Mongolia has set an age limit for jockey children to seven-years of age. The national crime statistics (2020 National Statistics Office, Crime Records) show no incidence of forced labor reported in either 2018 and 2019 in both districts.

#### **6.2.13.6 Remuneration and Fair Salary**

Workers in the workforce receive a salary according to the labor law of Mongolia. However, a significant number of people work in the informal sector where there is no contractual job guarantee and no fair salary. People accept these jobs as survival mechanisms. Most residents in the project areas work in the informal sector. According to the annual sample survey on wages conducted by the NSO in 2010, the national average salary for men was 14.3 percent higher than that of women (GCSD 2012). According to the World Bank (Khan and Aslam 2013, 17-19), "large and increasing raw gender-earnings gaps exist across almost all industry sectors that women are concentrated in, the main exceptions being wholesale and retail trade and public administration."

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## 7. Potential Environmental and Social Impacts

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### 7.1 Environmental Impacts Assessment

The ESIA process is a systematic approach to identifying the environmental and social impacts of a project, and describing the mitigation, management and monitoring measures that will be implemented to address these impacts.

An overview of the process followed in compiling the ESIA report and the methodology used for assessing potential environmental impacts from project activities were presented in Section 3. The impact assessment methodology is based on the principles of potential sources for impacts, their pathways, and receptors. The potential source of impacts in this context has been identified in relation to the BWSE project activities and its phases.

The receptors under consideration relate to landscape or soil, air quality, Tuul River water quality, and ecosystem services. In addition to this, regional and transboundary issues of the Tuul River were generally discussed.

The two principal criteria to determine the significance of effects are the magnitude of impact and the environmental sensitivity of the location or receptor. The combination of the magnitude of impact and receptor sensitivity criteria is assessed using the significance matrix presented in Section 3 to generate impact significance categories such as high, moderate, low and negligible. In other words, a higher level of significance is generally determined to large-scale impacts and impacts on high sensitivity receptors. Thus, it is important that well-reasoned judgement of these two criteria is achieved. This methodology is based on approaches commonly used in impact assessment, and takes into consideration the IFC PSs (e.g., predict impacts, evaluate impacts, mitigate/enhance, and evaluate residual impacts).

A summary of the receptor sensitivity and impact magnitude criteria used for each receptor in the assessment is presented in relevant sections. Pathways that could link the potential source impacts and receptors have been identified. The potential impacts and pathways are determined based on the BWSE project activities and its phases.

The BWSE project, activities and phases are described in Section 5. As part of the BWSE project design, measures to avoid or minimize impacts were identified and incorporated into the design. These are referred to as “best engineering practices” and include physical design features and technical specifications and are set forth in Section V, Works Requirements of the respective Construction Contract Documents, as described in Section 5.3. These best engineering practices considered the mitigation hierarchy as described in IFC PS 1. The ESIA team assessed the anticipated impacts documented in Section 7 assuming that the best engineering practices—i.e., technical specifications and other requirements in the construction contract documents—would be executed by the BWSE project construction contractors.

### 7.2 Project Activities and Key Issues

Potential impacts for various environmental receptors due to BWSE project activities anticipated during pre-construction<sup>49</sup>, construction, operation and maintenance phase are addressed. As mentioned in Section 3.2, the decommissioning phase was eliminated from detailed impact assessment. The BWSE project key activities and phases that are expected to interact with

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<sup>49</sup> Pre-construction phase is referring the during BWSE design.

environmental component receptors are summarized in Table 7-1. The potential impacts on environmental components are derived based on these project key activities.

**Table 7-1 Interaction between Project Components and Key Activities**

Project phase	Project components	Project key activities
<b>Pre-construction</b>	Wellfield Raw and Finished water pipeline AWPP site	Exploratory and test well drilling Geophysical survey Geotechnical field survey Topography and Geodesy field survey
<b>Construction</b>	Wellfield	Vehicles and transporting materials Production well drilling Well construction Land clearance and Earthworks Temporary work camp Storage of waste
	Raw and Finished water pipeline	Excavation of tunnel for pipeline installment Vehicles and transporting materials Jacking of pipes at crossings with Tuul river and railway lines Temporary work camps Storage of waste
	AWPP	Vehicles and transporting materials AWPP facilities development Land clearance and Earthworks Temporary works camp Storage of waste
<b>Operation and Maintenance</b>	Wellfield	Ground water abstraction Access road
	Raw and Finished water pipeline	Access road Maintenance of Pipeline
	AWPP	Storage of waste Solid and liquid disposal Access road

The engineering and design of the BWSE project has incorporated a number of the best engineering practices to ensure potential impact avoidance and minimization; these measures are detailed in Section 5.3. However, the following measures based on best engineering practices were considered in the impact assessment, but not limited to list the below:

#### **Raw and finished water pipeline:**

- Fiber optic cable will be relocated according to drawings<sup>50</sup>.
- Where the raw water pipeline would cross the Tuul River, jacking techniques would be used for perennial streams, whereas open-cut techniques would be used for intermittent streams. Therefore, the rehabilitation of streams crossings would be undertaken immediately as soon as attainable following installation of raw water pipeline.
- During construction, vegetation cover would be cleared due to increased traffic at construction sites. Thus, traffic control would be required at least.

<sup>50</sup> Ulaanbaatar City, Khan-Uul Distric, Songinokhairkhan District: DETALIED DESIGN of TELECOMMUNICATION FIBER OPTIC CABLE RELOCATION AND PROTECTION (Detailed Design Drawings). 2020.

- The trench for a raw water pipeline from two wellfields to AWPP and finished water pipeline from AWPP to USUG water distribution network would be backfilled with the same materials which it was excavated. The additional bedding materials would use to support the pipelines.
- After completion of backfill, the removed topsoil would be placed back on the construction corridor and soil cover would be restored as closely as possible to the baseline conditions.

#### **Wellfield:**

- The Tuul River surface water resource would be impacted due to groundwater abstraction from Shuvuun and Biokombinat wellfield. Thus, the Tuul River surface water level would be monitored during operation phase.
- After construction activities, impacted soil cover would be restored as closely as the baseline conditions.
- It is expected that wellfield access roads would be improved at locations where required for safe access by construction and operations workers.
- The existing groundwater wellfields (i.e., Nisekh, CHP3 and CHP4) could be impacted due to groundwater abstraction from Shuvuun and Biokombinat wellfield. Thus, groundwater level at current wellfields would be monitored during the operation phase.

#### **AWPP activities:**

- After the construction activities of AWPP facilities, impacted land cover would be restored as closely as possible to the baseline conditions.
- Mongolian marmot (*Marmota sibirica*) and its habitat at the AWPP site would be impacted during construction under AWPP. Thus, marmots currently inhabiting the AWPP site would be monitored during the construction mobilization at the AWPP site.
- The archaeological sites at the west-side to AWPP site and ovoo at the south-side to AWPP site would be impacted during construction of AWPP facilities. They would be protected and monitored (for example, by experts from Institute of Archaeology of Mongolian Academy of Sciences) during the construction activities of AWPP facilities.
- Tuul River surface water quality would impact due to brine disposal discharge from AWPP operation. Thus, brine disposal quality would be monitored and compared with relevant MNS 4943:2015 standard during AWPP operation.
- Access roads at AWPP site would be restored to their former state.

## **7.3 Pathways**

Pathways are means by which an activity can impact a receptor. The pathways considered in the ESIA process are summarized below:

- Removal of topsoil and other soil layers during earthworks
- Erosion and losses of soils by wind and surface runoff
- Change in physical and chemical properties of soils
- Change in groundwater levels due to abstraction of groundwater
- Change in interaction of Tuul River surface water and groundwater
- Direct release of contaminants to soil due to project activities
- Direct release of contaminants to surface water due to jacking processes for crossing Tuul river
- Leaching of contaminants from already polluted soils and contaminated sediment in Tuul river bed into groundwater aquifer



## 7.4 Landscape and Land Use

Landscape and land use across the AoI are mainly determined by a combination of relief, local climate, geology, topography, soils and the Tuul River hydrological regime. An understanding of the nature of any project is vital to the landscape and visual impact assessment process, including all project activities that could affect landscape and visual amenity during project implementation, from pre-construction to decommissioning.

The construction phase includes a number of temporary structures which would have temporary impacts on surrounding landscape and visual amenity in the AoI. Given the temporary nature of impacts, no landscape and visual amenity measures are considered necessary. Landscape and visual amenity impacts during the BWSE project are likely to be negligible due to BWSE project components activities. In other words, the embankments would be in the proposed wellfields area, where no local communities are regularly living or present. In addition to this, access roads would be along existing access roads to the proposed wellfields and AWPP site. Thus, no visual amenity impacts for local communities, and as a consequence, visual amenity impacts due to the BWSE project activities would be very limited. The only direct impact receptor is soil (e.g., excavation); therefore, this section focuses on describing characteristics of soil types and impacts on them.

The sensitivity of soils is primarily related to the geochemical nature of the soils, nutrients and to the hydrological cycling process of which they are a part of (e.g., whether the soils are prone to erosion and the fertility of soils). In addition to this, given the limited extent of disturbed soil due to pipeline installation, experience on other similar projects shows that re-establishment of baseline for soil with flora is re-established between 1 and 2 years. This is considered in our impact assessments. At the AWPP site, landscaping is included in the design.

Assessment of the soil impact significance is a qualitative process, which can be subjective and relies on reasonable judgment that is supported by evidence as far as possible. Significance is not an absolute value; it can only be defined in relation to each soil development process and location. Therefore, the criteria and the significance thresholds used are reviewed for each assessment in order to ensure their relevance. The criteria tables below provide only a guide to the approximate level of significance of impacts, and the actual conclusions of the assessment may vary. The full assessment provides an explanation, using well informed and reasoned professional judgement, as to how the conclusions about significance for each effect assessed have been derived.

### 7.4.1 Soil Receptor Sensitivity

Receptor sensitivity of soil is primarily related to geochemical characteristics of the soils and to hydrological and nutrient cycling processes such as erosion and contamination of soils. In addition to this, sensitivity of soil depends on land use types and present ecosystem condition in AoI. The classification of receptor sensitivity for soil is shown in Table 7-2.

Table 7-2 Soil receptor sensitivity

Receptor Sensitivity	Description
<b>Negligible</b>	Unused land or non-applicable to soil. Soil will always have sensitivity to any biotic factors (e.g. local climatic parameters)
<b>Low</b>	Robust to physical disturbance and resistant to contamination. The soil plays little or no role in the hydrological cycle or regulation of water of the Tuul River.
<b>Medium</b>	Vulnerable to physical disturbance, structurally prone to compaction or erosion and moderate leaching. The soil has some capacity for water retention and regulation and plays some role in the hydrological cycle of the Tuul River.
<b>High</b>	Highly vulnerable to physical disturbance, structurally prone to compaction or erosion.

	Highly leachable and prone to contamination. The soil plays key role in hydrological cycle and watercourse regulation of Tuul Rivers.
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The mountain and alluvial soils are typical soil types in the Aol. Alluvial soils in the Aol consist of three different soil types such as alluvial gravelly soil in the Shuvuun wellfield area, alluvial derno soil in the Biokombinat wellfield area and alluvial meadow soil in the Tuul River Riparian zone. Alluvial soils have high receptor sensitivity since they play an important role in the hydrological cycle and regulation of the watercourse in the Tuul River Valley. In addition to this, alluvial soils are structurally prone to compaction or erosion, as well as contamination through surface spills. Thus, alluvial soils have a low resilience to impact and do not easily return to their natural condition.

Mountain soils consist of kashtanozem and chestnut soils. They are moderately sensitive receptors due to their importance to the local hydrological cycle. They are relatively resilient to physical disturbance compared to alluvial soils. Mountain soils are distributed in foot-slope of Songinokhairkhan Mountain and are easily transported by surface runoff and sediment movement.

## 7.4.2 Soil Impact Magnitude

For soils, the magnitude of potential impact is determined predominantly in terms of the extent of soil loss. The main activities and pathways include the following:

- A direct change in soil geomorphological structure (excavation, topsoil remove, earthwork)
- Changes of soil chemical and physical properties (reclamation, resilience, contamination)
- Direct and indirect changes in contaminants affecting the soil
- Direct change in soil erosion and deposition

In particular, changes to the chemistry of soils may lead to the applicable soil quality standards being exceeded. The definitions for ranking of magnitude were informed by the Mongolia Law on Soil Conservation and Prevention of Desertification.

Table 7-3 presents a description of the magnitude of impacts for soils using the classifications negligible, low, medium and high.

**Table 7-3 Ranking of Magnitude of Soil Impacts**

Ranking of magnitude	Description
<b>Negligible</b>	No changes distinguishable from natural variability
<b>Low</b>	Impact on soil quality and condition is predicted to recover rapidly through natural processes and duration of impact is short (e.g., during the construction phase). The area affected by project activity is predicted to be of minor extent (e.g., less than 1 ha)
<b>Medium</b>	The impact on soil quality and condition may recover through natural processes and impact will be medium term. The affected area by project activity is predicted to be medium extend (e.g. affected area between 1-10 ha)
<b>High</b>	The potential for soil cover to be permanently impacted. Soil properties are to recover through natural processes on long term and rehabilitation is required. The affected area by project activity is predicted to be large (e.g., more than 10 ha)

## 7.4.3 Assessment of Potential Impacts

The impact magnitudes have been assessed against the impact magnitude criteria described in Table 7-3. This has been combined with the receptor sensitivity assessment using the matrix approach described in Section 3.

As mentioned in Section 6.1.7.7, the soil cover has been damaged due to many gravel mining activities along the Tuul River's northern floodplain in the Shuvuun area, where the proposed Shuvuun wellfield would be constructed. All of the areas excavated by gravel mining are located on alluvial gravelly soil in the Shuvuun area. The quarries have been banned with recent legislation and no further impact is occurring. However, these disturbed soils in the sanitary restricted zone of the Shuvuun wellfield need to be restored prior to the construction phase of the BWSE project since these disturbed areas would be potential contamination sources for groundwater resources in this area. Thus, it would impact to AWPP treatment processes.

Potential impact to soils in the Aol are likely to arise primarily during the construction phase of the raw and finished water pipelines, wellfields and AWPP facilities, through direct soil removal associated with land clearance and earthworks during the construction phase (see Table 7-4).

**Table 7-4 Direct Top soil disturbance due to Project activities**

Project components	Mountain kashtanozem soil (hectare)	Mountain chestnut soil (hectare)	Chestnut soil (hectare)	Meadowish soil (hectare)	Alluvial Derno soil (hectare)	Alluvial gravelly soil (hectare)
Raw water pipeline from Biokombinat wellfield to AWPP site	0.393	-	0.360	0.381	0.367	0.250
Raw water pipeline from Shuvuun wellfield to AWPP site	1.015	8.102	0.792	0.788	2.253	1.251
Branch raw water pipeline in Biokombinat wellfield	-	-	-	0.961	3.108	-
Branch raw water pipeline in Shuvuun wellfield	-	-	-	-	-	4.985
Finished water pipeline from AWPP site to USUG network	1.137	-	6.344	-	-	0.033
Access road to AWPP	-	-	2.026	-	-	-
Access road to Biokombinat wellfield	-	-	0.075	-	0.568	-
Access road to Shuvuun wellfield	-	-	-	-	-	3.415
Access road in Biokombinat wellfield	-	-	-	0.519	2.587	-
Access road in Shuvuun wellfield	-	-	-	-	-	3.622
Access road to Ovoo	-	-	-	-	-	-
AWPP facilities	1.07	-	4.26	-	-	-
Brine disposal channel	-	-	0.353	-	-	-
10 kV power transmission line in Shuvuun wellfield	-	-	-	-	-	4.698
10 kV power transmission line from AWPP to Biokombinat wellfield and in Biokombinat wellfield	1.159	-	0.396	1.337	2.131	0.484
<b>Total</b>	<b>4.82</b>	<b>8.1</b>	<b>14.7</b>	<b>4.0</b>	<b>11.0</b>	<b>18.7</b>

## 7.4.4 Pre-construction Impacts

### Wellfield, Raw and Finished Water Pipeline and AWPP Site

- **Exploratory and test well drilling:** Exploratory and test well drilling activities occurred in alluvial derno, meadowish and alluvial gravelly soils at the proposed wellfields. Soil

compaction occurred due to the movement of drilling vehicles and drillers on the ground. Compaction has the undesired effect of hindering air and water penetration beneath the soil surface and thus limiting aerobic activities of soil-dwelling organisms. This may have negative consequences on soil productivity on at site scale. Therefore, the magnitude of impact would be low for alluvial derno, meadowish and alluvial gravelly soil present on proposed wellfields, although the receptor sensitivity is high due to highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and importance for hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these soil types, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, task hazard assessments, and best engineering practices were implemented by the field investigation teams to avoid or minimize potential adverse environmental impacts, thus reducing the anticipated residual impact significance to low.

- **Geophysical survey:** The geophysical survey was temporary and occurred in alluvial derno, meadowish and alluvial gravelly soils at the proposed wellfield areas. The vehicle's movements during the geophysical survey resulted in new temporary dirty roads to access the wellfields as there is no existing designated access road. Vehicle movement could affect vegetation cover during the geophysical survey which in turn could impact soil compaction. However, this activity occurred temporarily. The spatial extent of the impact would be determined as at site scale. Therefore, the magnitude of impact would be low for alluvial gravelly, meadowish and alluvial derno soil present on wellfields, while the receptor sensitivity is high due to highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and importance for hydrological cycle regulation of Tuul Rivers Valley. This would result in moderate impact significance for these soil types, were best engineering practices not applied. However, health and safety management plan, site safety plan, emergency preparedness plan, and best engineering practices were implemented by the field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Geotechnical, Topography and Geodesy survey:** Geotechnical surveys gather information about soil consistency and structure, groundwater level and recommendations for the technical condition for the Aol. Following the borehole drilling, the samples collected from the ground are taken to the laboratory for analysis. These field surveys occurred as temporary in proposed wellfield areas (e.g., alluvial soil types), along raw and finished water pipelines (alluvial and mountain soil types) and at the AWPP site (e.g., mountain soil types). The spatial extent of the impact has determined as at site scale. Therefore, the magnitude of impact would be low for all alluvial soil types, while the receptor sensitivity is high because of highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and importance for hydrological cycle regulation of Tuul Rivers Valley. This would result in moderate impact significance for alluvial soil types, were best engineering practices not implemented. Addition to this, the magnitude of impact would be low for all mountain soil types, although the receptor sensitivity is moderate because of their importance to local hydrological cycling and relatively resilient to physical disturbance. This would result in low impact significance for all mountain soil types, were best engineering practices not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, and regulations on operational safety during engineering-geological and geotechnical works of construction, including General Requirements: CR 12-102-04, and best engineering practices were implemented by the field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.

The assessment of potential impacts on soil for the pre-construction phase is summarized in Table 7-5.

**Table 7-5 Assessment of Soil Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
Exploratory and Test well drilling	Soil cover disturbance and compaction Create the access road where required.  Spillage of engine fuel or other chemicals during operations.	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Health and safety management plan; Site safety plan; Emergency preparedness plan; Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;	Low
Geophysical survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Moderate		Negligible
Geotechnical field survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Moderate		Negligible
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Low		Negligible
Topography and geodesy field survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Moderate		Negligible
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Low		Negligible



## 7.4.5 Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site:

- **Production well drilling:** The production well drilling activities would occur in alluvial derno, meadowish and alluvial gravelly soil at the proposed wellfields. The soil compaction would occur due to the drilling vehicles and workers movement on the ground. This may have negative and direct impacts on soil cover. However, the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be low for alluvial derno, meadowish and alluvial gravelly soil present on proposed wellfields, although the receptor sensitivity would be high due to highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and importance for hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these soil types without the best engineering practices employed. However, Contractor implementation of the erosion control, detours and road accessibility, traffic control (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01030 and 01063) and clean up, protection of existing conditions, drilling preparation and performance pump testing best engineering practices (technical specifications, Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
    - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
    - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
    - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
  - Section 01030, Special Requirements
    - Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
    - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one

- (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
- Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
  - Section 01063, Miscellaneous Requirements
    - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
    - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
    - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
  - Section 02672, Water-Supply Well Construction, Development and Pumping Test
    - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer
    - Paragraph 3.03.A - Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.
    - Paragraph 3.04.A - *Decontamination Before Mobilization*: The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
    - Paragraph 3.04.B - *Staging of Well Installation and Construction Materials*: During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable substitute, so the materials will not come in contact with the ground. Materials, tools and casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.
    - Paragraph 3.04.C - *Disinfection During Construction*: The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the

sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.

- Paragraph 3.04.D - *Temporary Access Tracks and Drilling Platform*: 1) The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer. 2) Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.
- Paragraph 3.04.E – Water Resource: Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.
- Paragraph 3.08.A – *Pumping test*:
  - 1. Pumping test procedure:
    - a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.
    - b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)
    - c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease, soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.
    - d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping

equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.

e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria are detected, the Contractor shall re-chlorinate and analyze samples as many times as is necessary to obtain negative bacteria results, at no additional cost to Owner.

f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:

- Prior to startup of test (static water level)
- After 30 seconds
- One minute to 10 minutes: once every minute
- Ten minutes to 100 minutes: once every 10 minutes
- One hundred minutes to 4 hours: once every 30 minutes
- Four hours to 12 hours: once every hour
- Twelve hours to shut down: once every 2 hours
- Prior to shutdown of test.

g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.

h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.

i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.

j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.

k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.

- 2. Pumping equipment:

- a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.
  - b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.
- o 3. Discharge pipeline and flow measurement:
  - a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.
  - b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back into the well being pumped and influence the drawdown readings of the well being tested.
  - c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.
  - d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.
  - e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.
  - f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.



- 4. Pumping test records:
  - a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s) (in liters per second); the orifice head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.
  - b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.
- **Production well construction:** Based on the approved wellfield capacities, 14 and 16 production wells would be established at the proposed Biokombinat (e.g., alluvial derno and meadowish soil) and Shuvuun (e.g., alluvial gravelly soil) wellfields, respectively. Topsoil would be disturbed during the construction activities of the production well due to land clearance and vehicle movement in the surrounding area. This may have negative and direct impacts on soil cover. However, the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be low for all soil types present on proposed wellfields area, while the receptor sensitivity would be high due to highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and importance for hydrological cycle regulation of Tuul Rivers Valley. This would result in moderate impact significance for these soil types in case of no best engineering practices employed. However, Contractor implementation of the erosion control, traffic control, cleaning up project site and clearing and grubbing best engineering practices (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01063 and 01710; Division 2 Section 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
    - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls

to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.

- Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
- Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
    3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
    4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.

5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02230, Site Cleaning
    - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
    - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
    - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
    - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
    - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
    - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
    - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
    - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
  - **Pipeline installation:** Approximately 55,000 meters of transmission pipelines would be installed during the BWSE project implementation. Branch pipelines in each proposed wellfield would be installed to connect the production wells to the raw water transmission main pipelines to the AWPP. Additionally, two raw water transmission main pipelines would deliver water from the Biokombinat and Shuvuun wellfields to the proposed AWPP facilities. Branch pipelines in proposed wellfields would be constructed in alluvial derno, meadowish and alluvial gravelly soil at the proposed wellfields. The raw water pipeline from the proposed Shuvuun wellfield to the proposed AWPP would be installed in alluvial derno, meadowish, alluvial gravelly, mountain kashtanozem, mountain chestnut and chestnut soil at the Aol. The raw water pipeline from the proposed Biokombinat wellfield to the proposed AWPP would be installed in alluvial derno, meadowish, alluvial gravelly, mountain kashtanozem, and chestnut soil at the Aol. The pipeline trench would be excavated during the construction phase. The trenching activities would involve topsoil removal and storage of excavated materials in the construction corridor. This may have negative and direct impacts on soil cover along the construction corridor. Additionally, the depth of the trench would depend on the groundwater level in the Aol. In other words, if excavation of trench occurs below the groundwater table, then dewatering would be required. Given the design control of dewatering system in Section 5.1.5.1.1, discharged flow from the trenching activities would not impact on soil erosion processes. However, the spatial extent of the above-mentioned impact would be at site scale. The duration of these impacts would be short-term (e.g., limited to the construction phase). Therefore, the magnitude of impact would depend on soil types and the size of affected areas during the construction activities of the branch and main pipeline as discussed below.

- **Branch raw water pipeline in proposed Shuvuun wellfield area:** The magnitude of impact would be moderate for alluvial gravelly soil at the proposed Shuvuun wellfield, while the receptor sensitivity would be high due to the soil being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and its importance for hydrological cycle regulation of the Tuul River Valley. This would result in high impact significance for this soil type in the case that best engineering practices are not employed.
- **Branch raw water pipeline in proposed Biokombinat wellfield area:** The magnitude of impact would be moderate for alluvial derno, meadowish and alluvial gravelly soil at the proposed Biokombinat wellfield area, although the receptor sensitivity would be high due to the soil being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and its importance for hydrological cycle regulation of the Tuul River Valley. This would result in high impact significance for these soil types without the implementation of best engineering practices.
- **The raw water pipeline from proposed Shuvuun wellfield area to AWPP site:** The magnitude of impact would be moderate for alluvial derno, meadowish, and alluvial gravelly soil, while the receptor sensitivity would be high due the soils being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and their importance for hydrological cycle regulation of the Tuul River Valley. This would result in high impact significance for these soil types without the implementation of the best engineering practices. The magnitude of impact would be moderate for mountain kashtanozem, mountain chestnut and chestnut soil, while the receptor sensitivity would be moderate due to moderately sensitive receptor because of their importance to local hydrological cycling and relative resilience to physical disturbance. This would result in moderate impact significance for these soil types without best engineering practices employed.
- **The raw water pipeline from proposed Biokombinat wellfield area to AWPP site:** The magnitude of impact would be low for alluvial derno, meadowish, and alluvial gravelly soil, while the receptor sensitivity would be high due to the soils being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and their importance for hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these soil types without best engineering practices employed. The magnitude of impact would be low for mountain chestnut and chestnut soil, while the receptor sensitivity would be moderate due to their importance to local hydrological cycle and relative resilience to physical disturbance. This would result in low impact significance for these soil types in case of best engineering practices not being employed.
- However, Contractor implementation of best engineering practices for erosion control, backfilling operations following pipe laying, hours of operation, hours of construction, and safeguarding of open excavations, and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01030, 01046, and 01700) and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling best engineering practices (technical specifications, Division 2 Section 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented.

Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01030, Special Requirements
  - Paragraph 1.11.B - For the protection of life and property all backfilling operations shall follow closely behind pipe laying. Ensure that no excavation is left open, unguarded, or water filled during any period of time when Work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other Work areas.
  - Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
    - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
    - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
    - Section 01046, Control of Work
  - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
  - Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means



to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.

- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.

- Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a

degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.

- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
  - Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
  - Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
  - Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
  - Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
  - Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- **Tuul River crossing:** Raw water pipelines from the proposed Shuvuun and Biokombinat wellfields to AWPP site would cross the Tuul River using jacking techniques. The jacking activities for crossing the Tuul River would occur in alluvial soils. This would require temporary displacement of soil from the excavation process, including temporary stockpiling and storing of soil and re-profiling of the Tuul River bank. The impact would be short-term, whereas spatial extent of impact would be at site scale. The magnitude of impact would be low for alluvial soils, while the receptor sensitivity would be high due to their being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and their importance for hydrological cycle regulation of the Tuul Rivers Valley. This would result in moderate impact significance for these soil types in case of no best engineering practices applied. However, Contractor implementation of best engineering practices for erosion control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568 and 01700) and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials and backfilling best engineering practices (technical specifications, Division 2 Section 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
    - Section 01110, Environmental Protection Procedures
      - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
    - Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
      - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of

perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.

- Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
- Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
  - Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.

- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.



- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
  - Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
  - Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
  - Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- **Construction of AWPP facilities:** The AWPP facilities would be constructed above ground (e.g., RO building, main AWPP building) and underground (e.g. finished water tank and washwater recycle tank) and would be built on mountain kashanozem and mountain chestnut soil at the proposed AWPP area, whereas the brine sewer would be installed in chestnut soil. During the construction of the AWPP facilities, there is a potential impact to affect ground stability at the proposed AWPP site since this site located on the foot-slope of Songinokhairkhan Mountain. The structural design of the buildings of the AWPP has accounted for seismic risk in the area as defined by the Geotechnical Report. During the construction of AWPP facilities and brine sewers, soil loss could occur due to landscaping activities at the AWPP site. However, the impact would be short-term (limited to construction phase). The spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for mountain kashanozem and mountain chestnut soils, although the receptor sensitivity would be moderate due to their importance to the local hydrological cycle and their relative resilience to physical disturbance. This would result in moderate impact significance for these soil types without the best engineering practices being implemented. However, Contractor implementation of best engineering practices for the safeguarding of open excavations and erosion control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01046, 01110, 01568 and 01700) and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, erosion control barrier, plants, planting best engineering practices (as respectively defined in technical specifications, Division 2 Section 02210, 02268, and 02480) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
    - Section 01046, Control of Work
      - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
      - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment,

or other obstacles which could be dangerous to the public shall be well lighted at night.

- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.

- Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
  - Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
  - Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
  - Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
  - Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
  - Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
  - Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
  - Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
  - Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
  - Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
  - Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Section 02268, Erosion Control Barrier

- Paragraph 3.02.A - Barrier systems shall be installed in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated.
  - Paragraph 3.02.B – Attach the woven wire fencing to the posts that are spaced a maximum of 2 meters apart and embedded a minimum of 300 millimeters. Install posts at a slight angle toward the source of the anticipated runoff.
  - Paragraph 3.02.C - Trench in the toe of the filter fabric barrier with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow. Lay fabric along the edges of the trench. Backfill and compact.
  - Paragraph 3.02.D – Securely fasten the fabric materials to the woven wire fencing with tie wires.
  - Paragraph 3.02.E - Reinforced fabric barrier shall have a height of 450 millimeters.
  - Paragraph 3.02.F – Provide the filter fabric in continuous rolls and cut to the length of the fence to minimize the use of joints. When joints are necessary, splice the fabric together only at a support post with a minimum 150 millimeters overlap and seal securely.
- Section 02480, Landscaping
  - Paragraph 2.01.A - Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.
  - Paragraph 2.01.B - Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.
    - Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.
  - Paragraph 3.03.A - Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 75mm (3 inches) of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.
- **Temporary works camp:** Temporary works camp for each Contractor would be required during the construction phase. For example, these would include on-site accommodation and related facilities to serve the needs of the construction workforce, such as cafeterias, medical rooms, showers and toilets, and entertainment. These facilities would be provided with required services, such as power, heat, water supply, and waste disposal. Liquid and solid waste would be disposed of according to local legal requirements (e.g., package wastewater treatment plants, regular removal of trash). Site security would be provided to protect and safeguard facilities and equipment from outsiders, and to promote legally acceptable social behavior of the workers. The temporary works camp would build in all soil types (e.g., alluvial derno, meadowish, alluvial gravelly soil, mountain kashtanozem, mountain chestnut and chestnut soil) in the Aol due to each Contractor and BWSE project component location. Depending on the size of temporary facilities and number of workers of a camp could cause soil erosion and compaction around the camp location. However, the impacts from temporary works camp would be short-term (limited to construction phase). Also, the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be low for alluvial derno, meadowish, and alluvial gravelly soil, while the receptor sensitivity would be high due to the soils being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and their importance for

hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these soil types in case of that the best engineering practices are not employed. Additionally, the magnitude of impact would be moderate for mountain kashtanozem, mountain chestnut and chestnut soil, while the receptor sensitivity would be moderate due to their importance to the local hydrological cycle and relative resilience to physical disturbance. This would result in moderate impact significance for these soil types without the implementation of the best engineering practices. However, Contractor implementation of best engineering practices for erosion control, traffic control, field office, visitor center, temporary perimeter fence, temporary electrical, temporary heat, temporary sanitary conveniences, site security, and shelter and protection of materials and final cleaning best engineering practices (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01063, 01500 and 01700,) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.



○ Section 01500, Temporary Facilities

- Paragraph 2.01.A – Furnish temporary offices, storage and fabrication facilities as required and obtain all necessary applicable permits and/or approvals required for their use. Such facilities shall be located as required and as to not interfere with the Work of the project and shall be completely removed at the completion of the Work.
- Paragraph 2.01.B – Field Offices, equipped as indicated herein, shall be provided and ready for use within 30 days after the NTP and shall be maintained in full operation for a period of 30 days after commissioning, startup and acceptance of the CP-3 Conveyance facilities.
- Paragraph 2.01.C – Furnish field offices with heating, air conditioning, lighting, sanitary facilities, water for drinking, windows for natural lighting. Offices shall be well ventilated, and locks with keys turned over to Engineer.
- Paragraph 2.01.D – Field offices shall be provided with parking spaces reserved exclusively for Engineer and Owner vehicles.
- Paragraph 2.01.E – Provide weather-surfaced road, at least 3 meters wide, to each Field Office.
- Paragraph 2.01.F – Provide three Field Offices for the use of the Engineer. The offices shall be of approximately 19 m<sup>2</sup> (200ft<sup>2</sup>). Legally dispose of sanitary wastes. The office and rooms shall be constructed in a manner, and of materials, satisfactory to the Engineer. Office shall be weathertight with a minimum of six windows and two exterior doors. The office shall be adequately lighted for detailed working conditions, heated and air conditioned during the appropriate seasons. Thoroughly clean and mop the trailer on a weekly basis and restock all paper products such as but not limited to cups, towels, toilet paper, office copy paper, printer paper and plastic liners for waste baskets.
- Paragraph 2.01.G – Provide labor and material to locate and level Field Offices with access stairs, ramps and platforms as necessary to facilitate access.
- Paragraph 2.01.H – Operate and maintain facilities and associated equipment at own expense.
- Paragraph 2.01.I – Furnish janitorial services for the field office at least once a week. Service to include replenishing paper cups, paper towels, liquid soap, and toilet paper.
- Paragraph 2.01.J – Provide required utilities to facilities.
  1. Metered electric service.
  2. Thermostatically controlled heating unit or system of adequate capacity to maintain a minimum temperature of not less than 20 degrees C under all cold weather conditions. The Contractor shall provide all fuel used and service necessary.
  3. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  4. Thermostatically controlled, refrigerant type, air conditioner of adequate capacity to maintain a maximum temperature of not more than 22 degrees C. under all hot weather conditions. Contractor shall provide all service necessary and provide all power used.
  5. Adequate lighting and at least ten (10) duplex electrical receptacles.
  6. High speed internet service with wireless access. The Contractor shall be responsible for connection and paying all fees associated with providing this service for the duration of the Contract.
- Paragraph 2.05.A – Temporary Perimeter Fencing.

1. Temporary perimeter fencing is to be supplied and installed by the General Contractor, to enclose and secure the field offices, while providing screening of construction activities.
  2. Temporary fence shall be 2.4 meters (8 feet) above grade. All fence panels shall align with adjacent panels along top.
  3. Fencing metals to be low sheen black finish, 60 mm (2 3/8") galvanized posts with 11 gauge chain link fencing, 41 mm (1 5/8") top and bottom rail. All fencing is to have screening fabric, attached with galvanized metal heavy gauge wire clips, black color.
  4. Screening fabric shall be knitted polyethylene cloth, with reinforced band and grommets along top and sides for secure anchoring to chain link panels.
  5. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.
- Paragraph 3.02.A – Arrange for, furnish and maintain all expenses for all electricity required for proper lighting, heating, cooling and powering of the field offices to the time of final acceptance of the Work. Contractor shall be responsible for payment of electric power utility use charges over the period between start-up of utility service and final acceptance of the Work.
  - Paragraph 3.02.B – Furnish all wiring, fixtures, lamps and other accessories required for his or his subcontractors' work, and for proper lighting, the use of power tools and for temporary heat for construction operations up to the time of final acceptance. Power shall be obtained directly from power company lines or from portable, gasoline or diesel driven generator sets.
  - Paragraph 3.02.C – Temporary connections for electricity shall be subject to approval of the power company representative and shall be removed in like manner at the Contractor's expense prior to final acceptance of the Work.
  - Paragraph 3.02.D – Wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. Electrical facilities shall conform to the requirements of local electric utility providers.
  - Paragraph 3.03.A – Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
  - Paragraph 3.03.B – Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.
  - Paragraph 3.06.A – During the months of October through April, provide heat, fuel and services necessary to protect the field offices against damaged from dampness and cold and to maintain temperature above 13 °C (55 °F). Only approved equipment specifically designed for the purpose shall be used. Open salamanders will not be allowed.
  - Paragraph 3.06.B – The permanent heating system may be used for temporary heat prior to the occupancy of the Well Pump Houses by the Owner, or as otherwise approved by the Engineer, however, the use of permanent

equipment for temporary heat purposes shall not affect the guarantee period stated elsewhere in these specifications. Operate and maintain the temporary heating system (including fuel) and the equipment used for temporary heat until final completion of the project, and repair and replace all items damaged during temporary use. Clean all of the permanent heating equipment if it is used for temporary heat before turning the system over to the Owner. Contractor shall be responsible for payment of the district hot water utility use charges over the period between startup of utility service and final acceptance of the project.

- Paragraph 3.08.A – Provide adequate storage facilities for all materials required for the Work. The facilities shall be enclosed, heated and provided with moisture control, as required to provide adequate protection and shall be satisfactory to the Engineer.
- Paragraph 3.09.A – Contractor shall be responsible for protection of the Site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons.
- Paragraph 3.09.B – No Claim shall be made against Owner by reason of any act of an employee or trespasser, and Contractor shall make good all damage to Owner's property resulting from Contractor's failure to provide security measures as specified.
- Paragraph 3.09.C – Security measures shall include security fencing, barricades, lighting, and other measures as required to protect the Site. Additionally, the Contractor shall engage a guard service to furnish uniformed watchmen at each Site during all non-working hours twenty-four hours a day, seven days a week
- Paragraph 3.09.D – The Contractor shall do the following for Site entry control: restrict entry of unauthorized persons and vehicles into Site and existing facilities; allow entry only to authorized persons with proper identification; maintain log of workmen and visitors and make log available to Owner on request; coordinate access of Owner's personnel to Site
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- **Land clearance and earthworks for development of facilities:** Temporary alteration to soil cover would occur under BWSE project implementation as a result of land clearance and earthwork for construction of facilities, and vehicle movement for transporting material to site. The facilities would be included buildings for the AWPP, water pipelines, a brine sewer, production well houses, 10 kilovolt power transmission lines and temporary work camps. Vegetation cover would be damaged due to movement of heavy trucks, excavators and vehicles, exposing bare soils to erosion and compaction. Furthermore, bulk earthworks, such as topsoil stripping, grading and trenching excavation could cause ground instability due to overloading of slopes. Also, soil layers could be mixed during the

earthwork and stockpiling activities. Such mixed soils can change natural soil fertility. These impacts could lead to soil erosion and soil compaction, resulting in damage to the integrity of the soil. However, impacts to soil from land clearance and earthwork would occur as site scale. The duration of impacts would be temporary. In other words, these impacts would occur prior to construction activities for each facility. The land clearance and earthwork would occur in all soil types (e.g., alluvial derno, meadowish, alluvial gravelly soil, mountain kashtanozem, mountain chestnut and chestnut soil) in the Aol, given project component locations. Therefore, the magnitude of impact would be low for alluvial derno, meadowish, and alluvial gravelly soil, while the receptor sensitivity would be high due to their being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and their importance in hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these soil types in if best engineering practices were not employed. Additionally, the magnitude of impact would be moderate for mountain kashtanozem, mountain chestnut and chestnut soil, and the receptor sensitivity would also be moderate due to their importance to local hydrological cycle and their relative resilience to physical disturbance. This would result in moderate impact significance for these soil types without the application of best engineering practices. Considering the moderate susceptibility of all soil types to erosion, compaction and the required implementation of best engineering practices in sedimentation and erosion control by the construction contractor prior to and during any clearing of vegetation or excavation of materials, in accordance with technical specifications (as respectively defined in technical specifications, Division 1 Sections 01110 and 01568) and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, backfilling and maintenance of seeded areas and planting best engineering practices (as respectively defined in technical specifications, Division 2 Section 02210 and 02480), the anticipated residual impact significance would be low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.

○ Section 02210, Earth Excavation, Backfill, Fill and Grading

- Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
- Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
- Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally



- dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
  - Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
  - Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
  - Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
  - Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02480, Landscaping
    - Paragraph 3.10.A – Maintain lawn areas and other seed areas at maximum height of 6.5 cm by mowing at least three times. Weed thoroughly once and maintain until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.
    - Paragraph 3.10.B – Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
    - Paragraph 3.10.C - Reset settled plants to proper grade and position and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period
  - **Contamination of soil via use and storage of potential pollutants:** Specifically, there is some risk of soil pollution from leaks and spills during the handling and storage of fuels and waste products including hazardous materials. For example, refueling of heavy trucks and excavators at the site, drilling of production wells, and transporting of hazardous waste all have the potential to lead to soil contamination through accidental spillages. This, in turn, could lead to contaminant migration and potential impacts at some distance from the site where accidental spillages could occur. This would be medium in spatial extent for alluvial soils and minor in extent for mountain soils. Therefore, the magnitude of impact would be moderate for alluvial derno, meadowish, and alluvial gravelly soil, while the receptor sensitivity would be high due to these soils being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and important for hydrological cycle regulation of the Tuul River Valley. This would result in a high impact significance for these soil types without best engineering practices to be implemented. Additionally, the magnitude of impact would be low for mountain kashtanozem, mountain chestnut and chestnut soil, while the receptor sensitivity would be moderate due to their moderate importance to the local hydrological cycle and relative resilience to physical disturbance. This would result in low impact significance for these soil types in if best engineering practices were not employed. However, Contractor implementation of best engineering practices for the site-specific emergency plan, site-specific hazardous waste management plan, disposal of debris, safeguarding of open excavations, cleanup, temporary sanitary conveniences, and storage and handling of hazardous materials (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01710, 01500 and 01610) and well installation plan (technical specifications, Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to

low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.D – 1) Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
  - 2) The Emergency Action Plan shall include, but not be limited to the following:
    - a. Identification of hazards and risks associated with the Project.
    - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Levels of protection and selection of equipment procedures.
    - e. Field monitoring of petroleum products and potential pollutants.
    - f. Contingency and emergency procedures.
    - g. Listing of emergency contacts
  - Paragraph 1.04.E – 1) The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.
  - 2) Certain chemical and physical agents (i.e., asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulatory agencies, the Contractor shall notify the Owner immediately of the nature of the incident.
  - 3) The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
    - a. The location of potential hazards.
    - b. The potential adverse health effects posted by such hazards.
    - c. Proper safe work practices to prevent or reduce potential exposure.
    - d. Proper protective measures and equipment required.
    - e. Proper use of protective equipment.
    - f. Proper response to exposure incidents.
    - g. Proper disposal of hazardous materials.
  - 4) The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:
    - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
    - b. Hearing protection (plugs, muffs, etc.).

- c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).
- Paragraph 1.21.A – During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- Paragraph 1.21.B – Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- Paragraph 1.21.C – At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.
- Section 01046, Control of Work
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
  - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
  - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A – The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches,

channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.

3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
  6. Ensure that all hazardous material and waste has been removed from the project site.
- Section 01500, Temporary Facilities
    - Paragraph 3.03.A – Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
    - Paragraph 3.03.B – Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.
  - Section 01610, Delivery, Storage and Handling
    - Paragraph 1.05.C – 1) The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.
      - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:  
Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
      - b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.

- c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.
  - d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
- 2) Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.08.A - The Contractor shall submit a Well Installation Plan within 14 days after the Notice to Proceed. The Plan shall contain a description of Contractor's overall approach for the proposed pilot and finished boreholes, and constructing water-supply wells. The Plan shall also include a detailed description of Contractor's proposed means and methods for completing the Work specified herein, including photographs and/or drawings of the proposed equipment, tools, and supplies required to drill, sample, construct, develop, test, pump and inspect the Work.
  - Paragraph 1.08.B - The Well Installation Plan shall be approved and signed by an experienced Professional Hydrogeologist with expertise in water-well design and construction, and by the Engineer.
  - Paragraph 1.08.C The following shall be incorporated into the Contractor's Well Installation Plan and followed in the field. The plan shall include, but shall not be limited to, a discussion of the following:
    1. Proposed pilot borehole drilling, including methods of borehole installation, borehole diameter, soil-sampling, grain-size analysis, borehole geophysical surveying and borehole abandonment. It shall also include samples of the proposed report forms (geologic logs, grain-size analysis, borehole geophysical surveys, etc.)
    2. Description of proposed well-drilling methods for water-supply well boreholes, including methods to overcome well drilling challenges, well-installation procedures, including temporary casings proposed, well casing and screen installation, placement of artificial filter pack, transition pack and seal materials. It is recommended that the Contractor include a detailed description, including photographs, of the drilling rig and equipment proposed to perform the Work.
    3. The Contractor shall prepare a written Drilling Fluids Plan, subject to the review of the Engineer. The Drilling Fluids Plan shall describe the proposed additives to be used in the drilling fluid (for example, soda ash, bentonite, polymer); the proportions of these additives and method of mixing; and the proposed drilling fluid properties (pH, drilling-fluid weight, fluid-loss, viscosity and calcium content). The Drilling Fluids Plan shall also explain how the drilling fluids will work in harmony with the Contractor's drilling equipment with the overall goal of stabilizing the boreholes. The Drilling Fluids Plan shall describe the additives to be used to break down the filter cake once the well screen is installed and well development commences. Finally, the Drilling Fluids Plan shall include the name and experience record of the Drilling Fluids Engineer(s) who will monitor the drilling fluids for optimal performance throughout the drilling and well-construction process. It is recommended that the Contractor include a detailed description, including photographs, of the drilling mud mixing and circulation equipment proposed to perform the Work.
    4. In the Drilling Fluids Plan, the Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives.



5. The Contractor shall submit for approval product data (see PART 2 – PRODUCTS) for: stainless steel well-casing and well-screens, centralizers and the products proposed for joining sections of well casing and screen (e.g., couplings or welding rods); water-supply source; artificial filter pack, transition pack; well sealant to be placed between the well casing and the borehole wall.
6. Description of methods to be used to test for plumbness and alignment., in conformance with Paragraphs 3.06 H and J of this specification.
7. Description of methods and quality control procedures to be used for placement of the artificial filter pack, transition pack and seals in the borehole, including depth measurements.
8. Description of well development methods to be used, in conformance with Paragraphs 3.07 and 3.12G of this specification.
9. Description of performance pumping-test methods, in conformance with Paragraph 3.08 of this specification.
10. Blank Forms/Report Templates, including: Borehole Log form (for water-supply wells); Geologic Log form, Grain-size Distribution Curves, Borehole Geophysical Report form (for pilot boreholes); Final Well Design Report/Proposed Well Construction Diagram Template; Well-installation Diagram Template (As-Built Drawings), Plumbness and Alignment Test Record form; Well-development record form; Water-quality Sampling form; Pumping-test record form, Sand and Turbidity Testing form; Daily Activities Logs, Well Abandonment record form, and blank forms (paper and electronic spreadsheets) of tally sheets for drill strings, casings, tremie tubing cement, additives, filter pack materials, etc.
11. Description of contamination prevention, and well materials and equipment decontamination procedures.
12. Description of protective cover, surface completion procedures, including any special design criteria/features relating to frost heave prevention. The maximum frost penetration for the site shall be included in this description.
13. Description of water management methods, including any special design criteria/features relating to managing water from well drilling activities as well as pumping tests.
14. List of applicable publications, including GoM and local regulations and standards.
15. List of personnel assignments for this project, and personnel qualifications.
16. Description of well abandonment procedures.
17. Contractor's Health and Safety procedures.
18. Proposed source of water-supply for drilling.
19. Descriptions, materials of construction, drawings and layouts of proposed temporary drilling platforms and temporary access tracks, in conformance with Paragraph 3.04 D of this specification.
20. Floor plans, layouts, and other details related to temporary Field Offices, specified in SECTION 01500, TEMPORARY FACILITIES.
21. Details, descriptions, plans and layouts to be used for erosion and sedimentation control, as specified in SECTION 01568.

Assessment of potential impacts on soil during the construction phase are summarized in Table 7-6.

**Table 7-6 Assessment of Soil Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact	Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance	
					Measures	Overall			
Production well drilling	Topsoil disturbance	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Detours and road accessibility, and Traffic control as specified in Technical specifications at Division 1 Section 01110, 01568, 01030 and 01063;  Clean up, Protection of existing conditions, Drilling preparation and performance pump testing as specified Technical specifications at Division 2 Section 02672;	Low
Well construction		Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Traffic control, and Cleaning up project site as specified in Technical specifications at Division 1 Section 01110, 01568, 01063 and 01710;  Clearing and grubbing as specified in Technical specifications at Division 2 Section 02230;	Low
Pipeline installation	Compaction, mixing, and loss of soil structure as a result of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Erosion control, Backfilling operations following pipe laying, Hours of construction, Safeguarding open excavations and final cleaning as specified in Technical specifications at Division 1 Section 01110, 01568, 01030, 01046 and 01700;	Low
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Moderate	Moderate		Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact	Impact (Pre-Best Engineering Practices)	Significance	Best Engineering Practices	Residual Impact Significance
								Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, care and Restoration of property and Backfilling as specified in Technical specifications at Division 2 Section 02210;	
<b>Tuul river crossing</b>	Re-profiling of river bed and stream, and topsoil erosion	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control and final cleaning best as specified in Technical specifications at Division 1 Section 01110, 01568 and 01700;  Excavation, Separation of excavated material for reuse, Reuse and disposal of surplus excavated materials and Backfilling as specified in Technical specifications at Division 2 Section 02210;	Low
<b>Construction of AWPP facilities</b>	Mass soil movement and the formation of slope erosion features	Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Safeguarding of open excavations and Erosion control, final cleaning as specified in Technical specifications at Division 1 Section 01046, 01110, 01568 and 01700;  Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Erosion control barrier, Plants, Planting, and Planting and Maintenance of trees, shrubs and ground cover as specified in Technical	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact	Impact (Pre-Best Engineering Practices)	Significance	Best Engineering Practices	Residual Impact Significance
								specifications at Division 2 Section 02210, 02268, 02480 and 02483;	
<b>Temporary works camp</b>	Compaction and loss of topsoil	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Field office, Visitor center, Temporary perimeter fence, Temporary electrical, Temporary heat, Temporary sanitary conveniences, Site security, and Shelter and protection of materials, and Cleaning up project site as specified in Technical specifications at Division 1 Section, 01110, 01568 and 01500 and 01700;	Low
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Low		Low
<b>Land clearance and earthworks</b>	Increased soil exposure to erosion and loss of soil structure as a results of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Safeguarding of open excavations and Erosion control as specified in Technical specifications at Division 1 Section 01046, 01110, and 01568;	Low
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Moderate	Moderate	Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Backfilling and Maintenance of seeded areas and planting as specified in Technical specifications at Division 2 Section 02210 and 02480;	Low
<b>Contamination of soil</b>	Leaks and spills leading contamination and may affecting future use of soils	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration:	Moderate	High	Site-specific emergency plan, Site-specific hazardous waste management plan, Disposal of debris, safeguarding of open excavations, Cleanup, temporary sanitary	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact	Impact (Pre-Best Engineering Practices)	Significance	Best Engineering Practices	Residual Impact Significance
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate		Temporary Frequency: Occasionally	Moderate	Moderate	conveniences and Storage and handling of hazardous materials as specified in Technical specifications at Division 1 Section 01030, 01046, 01710, 01500 and 01610;  Well installation plan as specified in Technical specifications at Division 2 Section 02672;	Low



## 7.4.6 Operation and Maintenance Impacts

- **Groundwater abstraction from wellfields:** Groundwater abstraction from production wells in the Biokombinat and Shuvuun wellfields would not lead to further direct potential impacts on alluvial derno, meadowish and alluvial gravelly soil. Therefore, the magnitude of impact would be negligible for alluvial derno, meadowish and alluvial gravelly soil present at the proposed wellfields, although the receptor sensitivity would be high due to it being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and important for hydrological cycle regulation of the Tuul River Valley. This would result in low impact significance for all of these soil types if best engineering practices were not employed. However, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with *Special and Ordinary Protection and Sanitary Zones of Water Sources*, approved by joint decree A-230/127 of 2015, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Maintenance of pipeline:** Land clearance and earthwork for maintaining of the pipeline activities are not anticipated to require removal of all soils along pipeline compared with construction phase. Thus, soil disturbance would be limited and occur temporarily at site scale. Therefore, the magnitude of impact would be low for alluvial derno, and alluvial gravelly soils, although the receptor sensitivity would be high due to it being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and important for hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for these all soil types without the best engineering practices being employed. Moreover, the magnitude of impact would be low for mountain kashtanozem, and chestnut soil, while the receptor sensitive would be moderate because of their importance to the local hydrological cycle and relative resilience to physical disturbance. This would result in low impact significance for these all soil types in case of no best engineering practices employed. However, Operator implementation best engineering practices consistent with those implemented during construction, as well as compliance with MNS 5918:2008, MNS 5914 : 2008 and MNS 5916 : 2008, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.
- **Access roads:** Access roads would not generate direct potential impact to soils during operations since access roads on mountain kashtanozem, chestnut, alluvial derno, and alluvial gravelly soil to the two wellfields, to the AWPP and to the ovoo would have been constructed or enhanced during the construction phase. However, there is the potential impact for soils around operational site and access roads to be contaminated via vehicle movements, potential spills, leakages and accidents. However, this would be temporary and site scale. Therefore, the magnitude of impact would be low for alluvial derno, and alluvial gravelly soil, although the receptor sensitivity would be high due to it being highly vulnerable to physical disturbance, structurally prone to compaction or erosion, and important for hydrological cycle regulation of the Tuul River Valley. This would result in moderate impact significance for all of these soil types without best engineering practices being implemented. Also, the magnitude of impact would be low for mountain kashtanozem, and chestnut soil, while the receptor sensitive would be moderate because of their importance to the local hydrological cycle and relative resilience to physical disturbance. This would result in low impact significance for these all soil types in case of no best engineering practices being applied. However, Operator implementation of best engineering practices and management measures consistent with those implemented during construction when using access roads would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low/negligible.
- **Solid and liquid disposal:** The residuals handling facilities would be constructed under the design control of AWPP during the construction phase. Thus, residual handling

activities would not generate potential impacts to soils present on AWPP site and along brine disposal channel. Therefore, the magnitude of impact would be low for mountain kashtanozem, mountain chestnut and chestnut soil, while the receptor sensitive would be moderate because of their importance to the local hydrological cycle and relative resilience to physical disturbance. This would result in low/moderate impact significance for all of these soil types without the best engineering practices employed. However, Operator implementation of best engineering practices and management measures consistent with those implemented during construction in the handling and disposal of liquid and solid waste, as well as compliance with MNS 4943:2015, MNS 6458:2014, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low/negligible.

Assessment of potential impacts on soil for operation and maintenance phase is summarized in Table 7-7.

**Table 7-7 Assessment of Soil Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Best Practices Engineering	Residual Impact Significance
<b>Groundwater abstraction from Wellfield</b>	No impacts	Alluvial gravelly, alluvial derno and meadowish soil	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development;	Negligible
<b>Maintenance of pipeline</b>	Compaction, mixing, and loss of soil structure as a result of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent best engineering practices used during construction; ;	Low
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Low	MNS 5918:2008-The General Technical Requirements for Vegetation of Eroded Land; MNS 5914 : 2008-Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions; MNS 5916 : 2008- Topsoil stripping and storage during earthworks;	Low
<b>Access road</b>	Leaks and spills leading contamination	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices used during construction.	Low
		Mountain kashtanozem,	Moderate			Low	Low		Negligible

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Best Practices Engineering	Residual Impact Significance
		Mountain chestnuts and chestnuts			Frequency: Occasionally				
<b>Solid and liquid disposal:</b>	Compaction and loss of topsoil	Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Low/Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction. MNS 4943:2015- Effluent Wastewater Quality Standard MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals	Negligible/low

The potential impacts from the BWSE project activities to soils have been identified and summarized in Table 7-5, Table 7-6 and Table 7-7.

As shown in Table 7-5, Table 7-6 and Table 7-7, the potential impacts to soils in the Aol are likely to arise primarily during construction activities of the raw and finished water pipeline, wellfields, AWPP facilities and temporary facilities such as workers camps, through direct soil disturbance and removal associated with land clearance and earthworks during the construction phase.

In addition to this, operations and maintenance activities related to the BWSE project would be limited. Where required, these activities would involve routine inspections, maintenance and monitoring of the production well, pipelines and AWPP activities.

As a result of the impact assessment of soils due to BWSE project activities, the significance of the residual impacts on soils would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

## 7.5 Air Quality and Greenhouse Gas Emissions

The potential impacts on air quality are derived through looking at the activities of the BWSE Project. These are described in detail in Section 5. The main sources of emissions to air quality in the Aol during the construction phase of the raw and finished water pipeline, wellfields and AWPP are likely to be dust, vehicle emissions and emissions from sources such as temporary generators at construction sites and work camps. With regard to emissions other than fugitive dust, the key concern is the potential impact to human health due to carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), and sulphur oxides (SO<sub>x</sub>). However, given the scale and limited longevity of these emissions, they are not considered to have more than a highly localized and minor air quality effect.

Table 7-8 presents the relevant ambient air quality standards for the BWSE project based on the Mongolian national limits set down in MNS 4585:2016 and IFC EHS General Guidelines, which are in turn based on WHO Air Quality guidelines (IFC. 2007b). This assessment of air quality impacts is focused on the Mongolian national limits and these are supplemented with IFC EHS General Guidelines where applicable.

**Table 7-8 Relevant Air Quality Standards**

Pollutant	Averaging Period	Mongolian Standards (µg/m³)	WHO ambient air quality guidelines (GL) and interim targets (IT), (µg/m³)
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	20 minute	200	
	1 hour	-	200
	24 hour	50	-
	Annual	40	40
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	10 minute	500	500 (GL)
	15 minute	-	-
	20 minute	450	-
	1 hour	-	-
	24 hour	50	125 (IT-1) 50 (IT-2) 20 (GL)
	Annual	20	-
<b>Total particulate matter (PM)</b>	20 minute	500	-
	24 hour	150	-
	Annual	100	-
<b>Particulate Matter (PM<sub>10</sub>)</b>	24 hour	100	150 (IT-1) 100 (IT-2) 75 (IT-3) 50 (GL)
	Annual	50	70 (IT-1)



Pollutant	Averaging Period	Mongolian Standards ( $\mu\text{g}/\text{m}^3$ )	WHO ambient air quality guidelines (GL) and interim targets (IT), ( $\mu\text{g}/\text{m}^3$ )
			50 (IT-2) 30 (IT-3) 20 (GL)
<b>Particulate Matter (<math>\text{PM}_{2.5}</math>)</b>	24 hour	50	75 (IT-1) 50 (IT-2) 37.5 (IT-3) 25 (GL)
	Annual	25	35 (IT-1) 25 (IT-2) 15 (IT-3) 10 (GL)
<b>Carbon Monoxide (CO)</b>	20 minute	60,000	-
	1 hour	30,000	-
	8 hour	10,000	-
<b>Ozone (<math>\text{O}_3</math>)</b>	8 hour	100	160 (IT) 100 (GL)
<b>Lead (Pb)</b>	24 hour	1	-
	Annual	0.5	-
<b>Note: <math>\mu\text{g}/\text{m}^3</math> = micrograms per cubic meter of air.</b>			

## 7.5.1 Air Quality Receptor Sensitivity

In general, air quality limits for the protection of human health are set at a level that research indicates is 'safe' for the general public. In theory, air quality concentrations sustained above the prescribed limits have the potential to lead to adverse health effects. It is also acknowledged that the characteristics of receptors may affect their sensitivity to changes in air quality concentrations. For example, in general, the elderly and children are more likely to be adversely affected by changes in air quality than middle aged adults. Therefore, locations of local communities (including elderly, children and middle-aged adults) are considered to represent locations of higher sensitivity (see Figure 7-2, Figure 7-3 and Figure 7-4). Description of receptor sensitivity for air quality is described in Table 7-32.

**Table 7-9 Air quality receptor sensitivity**

Receptor Sensitivity	Description
<b>Negligible</b>	Local communities or habitats and ecosystems which are not affected by air pollutant concentrations.
<b>Low</b>	An area where local communities are not expected to be present over regular time or modified habitats of ecosystems which are not likely to be affected by air pollutant concentrations
<b>Moderate</b>	An area where local communities are temporary present or natural habitat of ecosystems that could be affected by air pollutants concentrations exceeding the relevant air quality standards
<b>High</b>	Permanent local communities or critical habitats of ecosystems that could be affected by air pollutants concentrations exceeding the relevant air quality standards

## 7.5.2 Air Quality Impact Magnitude

Descriptions of the criteria used to classify the magnitude of potential impacts for air quality are presented in

Table 7-33. Some guidance on this issue is provided by the IFC, which recommends that any new project should contribute at most 25 percent of any applicable ambient air quality limit to allow for future developments<sup>51</sup>.

The magnitudes of impacts have been assessed against the impact magnitude criteria presented in

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<sup>51</sup> IFC Performance Standard and Guidance Notes, 2012.

Table 7-33 and Table 7-10. This has been combined with the receptor sensitivity assessment using the matrix approach discussed in Section 3.

**Table 7-10 Ranking of Magnitude of Air Quality**

Ranking of magnitude	Description
<b>Negligible</b>	Project activities contributions plus existing background concentrations are <5% of the baseline value No visible increase in dust levels. Temporary combustion emissions during construction
<b>Low</b>	Project activities contributions plus existing background concentration is 5–20% of the baseline value. Visible increase in dust levels not predicted to cause a nuisance, lead to complaints or adverse health impacts
<b>Medium</b>	Project activities contributions plus existing background concentration is 20–50% of the baseline value. Dust is a nuisance to local communities or will cause minor effects on natural habitat of ecosystems
<b>High</b>	Project activities contributions plus existing background concentration is >50% of the baseline value. Dust is a significant nuisance to local communities or will cause moderate effects on critical habitat of ecosystems.

### 7.5.3 Assessment of Potential Impacts on Air Quality and Greenhouse Gas Emissions

In this section we aim to provide an estimate of total project emissions of GHG, including embodied carbon, emissions during construction, and during operations and maintenance.

#### 7.5.3.1 Greenhouse Gas Emissions

In this section we aim to provide an estimate of total project emissions of GHG, including embodied carbon, emissions during construction, and during operations and maintenance.

##### **Embodied Carbon:**

The embodied carbon of construction materials, as used here (e.g., Hammond and Jones, 2011), is the carbon footprint of the materials before they are used directly in a construction project (i.e., cradle to gate). It is a component of the carbon cycle that has been often overlooked in the past but, with cement production accounting for an estimated 7 percent of global GHG emissions (Anderson and Moncaster, 2020), it is becoming ever more salient as a problem to be solved.

Theoretically, the embodied carbon of every element proposed by designers could be counted – there are an increasing number of very detailed databases that can provide the embodied carbon from anything from a door handle to a flush toilet. With the development of new design tools, such as Building Information Models, it is becoming easier to associate design elements and the carbon footprint listed in these databases during the design phase. This is still not common practice in the water sector, though, as most designs are done with traditional CAD software, where elements are measured in lengths and volumes, rather than weights.

Specifically, for this project, a detailed analysis of embodied carbon was not carried out. However, on a project like this, a large treatment plant and many kilometers of pipelines, it is clear that concrete, steel and ductile iron would represent the largest carriers of embodied carbon; by sheer weight alone, they outweigh all other components by orders of magnitude. Also, their specific carbon footprint is high, particularly for cement. For example, data reported by Zawartka, Burchart-Korol, and Blaut (2020) would suggest that the GHG contribution of concrete in a central

wastewater treatment plant represents over 90 percent of all emissions of the plant due to construction materials (i.e., embodied carbon). While not quite a like-for-like comparison, it is expected that similar percentages could be expected from the AWPP and other structures of the BWSE (i.e., wellhouses, guardhouses, valve vaults). The pipelines, made mostly of ductile iron with some sections in steel, can be considered as made only of that respective material.

A summary review of material quantities estimated for this project confirms that concrete, ductile iron and steel as particularly relevant in terms of amount of material. The concrete estimates are based on listed volumes. The ductile iron estimates are based on listed pipe lengths and diameters, with a 10 percent increase to allow for fittings. The reinforcing steel (rebar) is estimated as a percentage of concrete volume, varying between 0 percent and 5 percent, depending on structural use. The pipe steel is estimated on pipe lengths and diameters listed, with a 10 percent increase to allow for fittings. The estimated weights of these are presented in Table 7-11.

**Table 7-11 Embodied Carbon – The Big Players**

Material	Amount
Concrete	40,535 m <sup>3</sup>
Ductile iron (pipes and fittings)	12,489 tonnes
Steel (rebar)	6,693 tonnes
Steel (pipes and fittings)	2,622 tonnes

To estimate embodied carbon per cubic meter of concrete, we used the Embodied Carbon in Construction Calculator tool (Carbon Leadership Forum, 2020)<sup>52</sup>. This required a concrete recipe. We assumed a basic concrete recipe using 350 kilograms of Portland cement, 1,900 kilograms of aggregates, and 150 kilograms of water. We also assumed cement production in Dornogobi aimag, 520 kilometers from UB, where a major Mongolian cement plant is located, while water and aggregates will be sourced locally. The results of the calculation are summarized in Table 7-12.

**Table 7-12 Embodied Carbon in Concrete - Breakdown**

Contributing Component	Kg CO <sub>2</sub> per m <sup>3</sup> of concrete
Cement	319.2
Aggregates	14.2
Transport of constituents	29.7
Concrete batching	1.7
Waste	1.7
Transport of concrete	2.3
<b>TOTAL</b>	<b>368.8</b>

<sup>52</sup> <https://circularecology.com/concrete-embodied-carbon-footprint-calculator.html>

For ductile iron and steel, the carbon coefficients for construction materials are taken from Embodied Carbon: The Inventory of Carbon and Energy (ICE) by Hammond and Jones (2011), as summarized in the supplementary material of Chai et al. (2015). The values are shown in Table 7-13

**Table 7-13 Carbon Coefficients of Construction Materials by ICE**

Material	Embodied Carbon [kg CO <sub>2</sub> /kg]
Ductile iron pipe and fittings	2.700
Steel pipe and fittings	2.700
Steel	1.770

The embodied carbon values from Table 7-12 and Table 7-13 can be associated with the estimated materials quantities of Table 7-11 to give an estimate of embodied carbon for the project. As an indication for the materials not considered in this limited analysis, such as glass, wood, and aluminum, 10 percent of the reinforced concrete value is added again. The overall estimate of embodied carbon is summarized in Table 7-14.

**Table 7-14 Embodied Carbon Estimate for the BWSE Project**

Material	Embodied carbon [tonnes]
Concrete	14,950
Ductile iron pipes and fittings	33,721
Steel pipes and fittings	7,080
Steel rebar	11,847
Other materials (assumed 10% of reinforced concrete contribution)	2,680
<b>TOTAL</b>	<b>70,278</b>

## Greenhouse Gas Emissions During Construction

Greenhouse gas (GHG) emissions from construction equipment are a major component of total emissions on any large project due to fuel consumption. In general, equipment productivity rate affects the fuel consumption. Thus, an estimating tool based on the construction equipment productivity rates could quite accurately assess the GHG emissions resulting from the equipment activities. In other words, the combination of the productivity rate of equipment models (e.g., excavators and bulldozers) and the fuel consumption rates for diesel fuel is used to formulate an overall estimate of total GHG emissions based on the equation below (Hajji and Lewis, 2017, Hajji et al., 2017).

$$GHG \text{ emissions} = 10.15 * (\text{soil quantity} / \text{productivity rate}) * \text{fuel consumption rate} * \text{engine horsepower}$$

In this equation, the productivity rate was calculated using multiple regression method based on relevant specifications of excavators and bulldozers such as capacity of the bucket, the size of engine, the efficiency rate or load factor, soil type, cycle time, dozing distance, soil grade, etc.



Furthermore, the CO<sub>2</sub> emissions have a significant correlation with fuel consumption (Lewis and Hajji, 2012). About 10.15 kilograms of CO<sub>2</sub> is released for 3.79 liters consumption of diesel fuel (David and Gary, 1993, EPA, 2007). The fuel use rate for diesel engines is fixed at 0.04 gal/hp-hr (Peurifoy and Oberlender, 2005). Thus, this approach would be used in this assessment.

There are several types of GHGs that would be emitted from BWSE Project activities. A high proportion of the emissions of GHG would be CO<sub>2</sub>. At the time of writing, AECOM is not able to confirm details about the heavy vehicles (e.g., excavators, bulldozers and heavy trucks) and their technical specifications that Contractors and Operators would use during the construction and operation phase.

However, AECOM has made efforts to estimate GHG emissions from the BWSE project activities based on above mentioned approach and equipment types and numbers (e.g., excavators and bulldozers) and technical specifications provided by heavy vehicle dealers in Mongolia<sup>53,54</sup>.

As shown in Table 7-15, CO<sub>2</sub> emission is estimated based on the bucket capacity and engine size of different excavators to excavate 933,078<sup>55</sup> cubic meters of sandy clay and sand gravel types of soil. The operation efficiency of all excavators is assumed at 0.75 and 25 seconds for cycle time.

Table 7-16 and Table 7-17 shows the calculated CO<sub>2</sub> emissions during the backfilling. A case is presented of bulldozers with different engine sizes that have to haul 196.897<sup>56</sup> cubic meters and stockpile at 5 meters for trench and 150 meters for AWPP site. The operation efficiency is set at 0.75 on flat soil surfaces, using a side by side dozing technique, and operated with average skill by the operator. In addition to this, Table 7-18 presents the calculated CO<sub>2</sub> emissions during the backfilling for trench from different excavator's activities.

The results shown in Table 7-15, Table 7-16, Table 7-17, and Table 7-18 indicate that productivity rates of the excavators and bulldozers are inversely proportional to the total time needed to excavate and stockpile soil. In other words, the longer the total time needed, the lower the productivity rate of the excavators and bulldozers. Moreover, longer total time needed to complete excavation and stockpiling activities causes more fuel consumption and CO<sub>2</sub> emission.

As AECOM is unaware of the specific machines that the contractor will use, the median and average values for GHG emissions estimated were calculated, and the greater of the two has been taken as indicative of emission for different types of work on the project. A summary table of these values, representing GHG emission estimates during the construction period, is presented in Table 7-19.

As shown in Table 7-20, GHG emissions from the vehicles in UB has been calculated based on vehicle types (JICA, 2017).

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<sup>53</sup> <http://www.wagnerasia.com>

<sup>54</sup> <http://www.hera.mn/miningproducts#>

<sup>55</sup> 933.078 cubic meters soil would be excavated for the BWSE project

<sup>56</sup> 196.897 cubic meters soil would be backfilled by bulldozer

**Table 7-15 CO<sub>2</sub> Emissions due to Excavation of Trenches and AWPP Site Using Different Excavators**

Excavator model	Bucket capacity (m <sup>3</sup> )	Size of Engine (hp)	Sandy clay soil type				Sand-gravel soil type			
			Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)	Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)
<b>M315D2</b>	0.76	137	75.63	16,023.56	255,849.71	685.19	64.18	18,880.13	301,460.98	807.34
<b>M320D2</b>	1.18	161	125.38	9,664.91	181,553.67	486.22	113.94	10,635.51	199,786.14	535.05
<b>308E2</b>	0.31	65	40.72	29,756.64	225,918.33	605.03	29.28	41,384.64	314,200.47	841.46
<b>313D2GC</b>	0.53	101	57.60	21,037.53	246,991.45	661.47	46.16	26,252.44	308,217.15	825.44
<b>313D2L</b>	0.65	101	74.58	16,247.38	190,752.55	510.85	63.14	19,191.65	225,319.79	603.43
<b>320D2L</b>	1.14	151	123.75	9,791.90	172,442.86	461.82	112.31	10,789.48	190,011.08	508.87
<b>320D2GC</b>	1	125	114.43	10,589.60	154,165.84	412.87	102.99	11,766.10	171,293.70	458.74
<b>323D2L</b>	1.33	158	147.68	8,205.27	151,565.70	405.91	136.24	8,894.39	164,294.84	440.00
<b>326D2L</b>	2.14	197	246.71	4,911.72	113,025.52	302.69	235.27	5,150.59	118,522.40	317.41
<b>330D2L</b>	1.87	213	202.05	5,997.54	149,277.99	399.78	190.61	6,357.57	158,239.26	423.78
<b>336D2GC</b>	2.69	280	291.20	4,161.43	136,149.12	364.62	279.75	4,331.64	141,717.76	379.53
<b>336D2</b>	2.69	280	291.20	4,161.43	136,149.12	364.62	279.75	4,331.64	141,717.76	379.53
<b>340D2L</b>	1.88	280	176.56	6,863.17	224,541.49	601.34	165.12	7,338.75	240,101.17	643.02
<b>R480LC-9S</b>	3.2	263	370.30	3,272.45	100,465.95	269.06	358.86	3,376.79	103,669.31	277.64
<b>R300LC-9S</b>	1.5	263	129.72	9,341.84	286,799.42	768.08	118.27	10,245.60	314,545.26	842.38
<b>R320LC-9</b>	1.73	278	156.60	7,738.01	251,110.10	672.50	145.16	8,347.96	270,903.79	725.51
<b>R850LC-9</b>	5.3	510	568.06	2,133.19	126,996.11	340.11	556.62	2,177.04	129,606.70	347.10
<b>Median for CO<sub>2</sub></b>										<b>508.87</b>
<b>Average for CO<sub>2</sub></b>										<b>550.37</b>
<b>* for 933.078 cubic meters soil excavation</b>										

**Table 7-16 CO<sub>2</sub> Emission due to Backfilling at AWPP site Using Different Bulldozers**

Bulldozer model	Size of Engine (hp)	Loose-stockpile (Backfilling for Trenching)			
		Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)
D6K	161	102.10	1345.62	25,289.29	256.69
D5R2	176	119.43	1150.41	23,634.98	239.90
D6R2	191	221.07	621.49	22,399.83	227.36
D7R	264	297.30	462.13	19,152.48	194.40
D8R	330	115.96	1184.78	17,801.99	180.69
HL757-9S	173	239.55	573.54	23,926.30	242.85
HL770-9S	280	89.40	1536.85	18,746.16	190.27
HL740-9S	150	164.47	835.34	26,909.98	273.14
HL760-9S	215	318.09	431.93	20,964.84	212.79
HL780-9S	348	115.96	1184.78	17,546.01	178.09
Median for CO <sub>2</sub>					220.08
Average for CO <sub>2</sub>					219.62
<i>* for 105.791 cubic meters soil stockpile in 150 meters</i>					

**Table 7-17 CO<sub>2</sub> Emission due to Backfilling of Trenches Using Different Bulldozers**

Bulldozer model	Size of Engine (hp)	Loose-stockpile (Backfilling for Trenching)			
		Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)
D6K	161	653.50	181.05	3,402.71	34.54
D5R2	176	670.82	176.38	3,623.67	36.78
D6R2	191	688.15	171.94	3,833.50	38.91
D7R	264	772.46	153.17	4,720.31	47.91
D8R	330	848.69	139.41	5,370.41	54.51
HL757-9S	173	667.36	177.29	3,580.40	36.34
HL770-9S	280	790.94	149.59	4,889.41	49.63
HL740-9S	150	640.79	184.64	3,233.09	32.82
HL760-9S	215	715.87	165.28	4,148.10	42.10
HL780-9S	348	869.48	136.08	5,527.92	56.11
Median for CO <sub>2</sub>					40.51
Average for CO <sub>2</sub>					42.97
<i>* for 91.106 cubic meters soil stockpile in 5 meters</i>					

**Table 7-18 CO<sub>2</sub> Emissions due to Backfilling of Trenches Using Different Excavators**

Excavator model	Bucket capacity (m <sup>3</sup> )	Size of Engine (hp)	Sandy clay soil type				Sand-gravel soil type			
			Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)	Productivity rate (m <sup>3</sup> /hr)	Duration* (hr)	Fuel consumption (L)	CO <sub>2</sub> (tonnes)
<b>M315D2</b>	0.76	137	75.63	16,023.56	255,849.71	685.19	64.18	18,880.13	301,460.98	807.34
<b>M320D2</b>	1.18	161	125.38	9,664.91	181,553.67	486.22	113.94	10,635.51	199,786.14	535.05
<b>308E2</b>	0.31	65	40.72	29,756.64	225,918.33	605.03	29.28	41,384.64	314,200.47	841.46
<b>313D2GC</b>	0.53	101	57.60	21,037.53	246,991.45	661.47	46.16	26,252.44	308,217.15	825.44
<b>313D2L</b>	0.65	101	74.58	16,247.38	190,752.55	510.85	63.14	19,191.65	225,319.79	603.43
<b>320D2L</b>	1.14	151	123.75	9,791.90	172,442.86	461.82	112.31	10,789.48	190,011.08	508.87
<b>320D2GC</b>	1	125	114.43	10,589.60	154,165.84	412.87	102.99	11,766.10	171,293.70	458.74
<b>323D2L</b>	1.33	158	147.68	8,205.27	151,565.70	405.91	136.24	8,894.39	164,294.84	440.00
<b>326D2L</b>	2.14	197	246.71	4,911.72	113,025.52	302.69	235.27	5,150.59	118,522.40	317.41
<b>330D2L</b>	1.87	213	202.05	5,997.54	149,277.99	399.78	190.61	6,357.57	158,239.26	423.78
<b>336D2GC</b>	2.69	280	291.20	4,161.43	136,149.12	364.62	279.75	4,331.64	141,717.76	379.53
<b>336D2</b>	2.69	280	291.20	4,161.43	136,149.12	364.62	279.75	4,331.64	141,717.76	379.53
<b>340D2L</b>	1.88	280	176.56	6,863.17	224,541.49	601.34	165.12	7,338.75	240,101.17	643.02
<b>R480LC-9S</b>	3.2	263	370.30	3,272.45	100,465.95	269.06	358.86	3,376.79	103,669.31	277.64
<b>R300LC-9S</b>	1.5	263	129.72	9,341.84	286,799.42	768.08	118.27	10,245.60	314,545.26	842.38
<b>R320LC-9</b>	1.73	278	156.60	7,738.01	251,110.10	672.50	145.16	8,347.96	270,903.79	725.51
<b>R850LC-9</b>	5.3	510	568.06	2,133.19	126,996.11	340.11	556.62	2,177.04	129,606.70	347.10
<b>Median for CO<sub>2</sub></b>										<b>508.87</b>
<b>Average for CO<sub>2</sub></b>										<b>550.37</b>
<b>* for 933.078 cubic meters soil excavation</b>										

**Table 7-19 Estimated CO<sub>2</sub> Emissions by Work Typology**

Work Description	Estimated Emissions [tonnes]
Excavation of trenches and AWPP site with excavator	550.37
Backfilling at AWPP site with bulldozer	220.08
Backfilling of trenches with bulldozer	42.97
Backfilling of trenches with excavator	550.37
<b>Total</b>	<b>1363.79</b>

**Table 7-20 CO<sub>2</sub> Emission from Different Vehicles Types in UB**

Vehicles type	CO <sub>2</sub> emission (t/year)	Traffic density (million vehicles, km/year)	CO <sub>2</sub> emission (kg/km/vehicle)
<b>Small car</b>	475.85	1709.27	0.28
<b>Large car</b>	179.46	615.56	0.29
<b>Middle and big Bus</b>	107.85	86.01	1.25
<b>Light truck</b>	44.83	146.51	0.31
<b>Heavy truck</b>	81.65	61.00	1.34
<b>Source: JICA, 2017, Baasankhuu, 2020</b>			



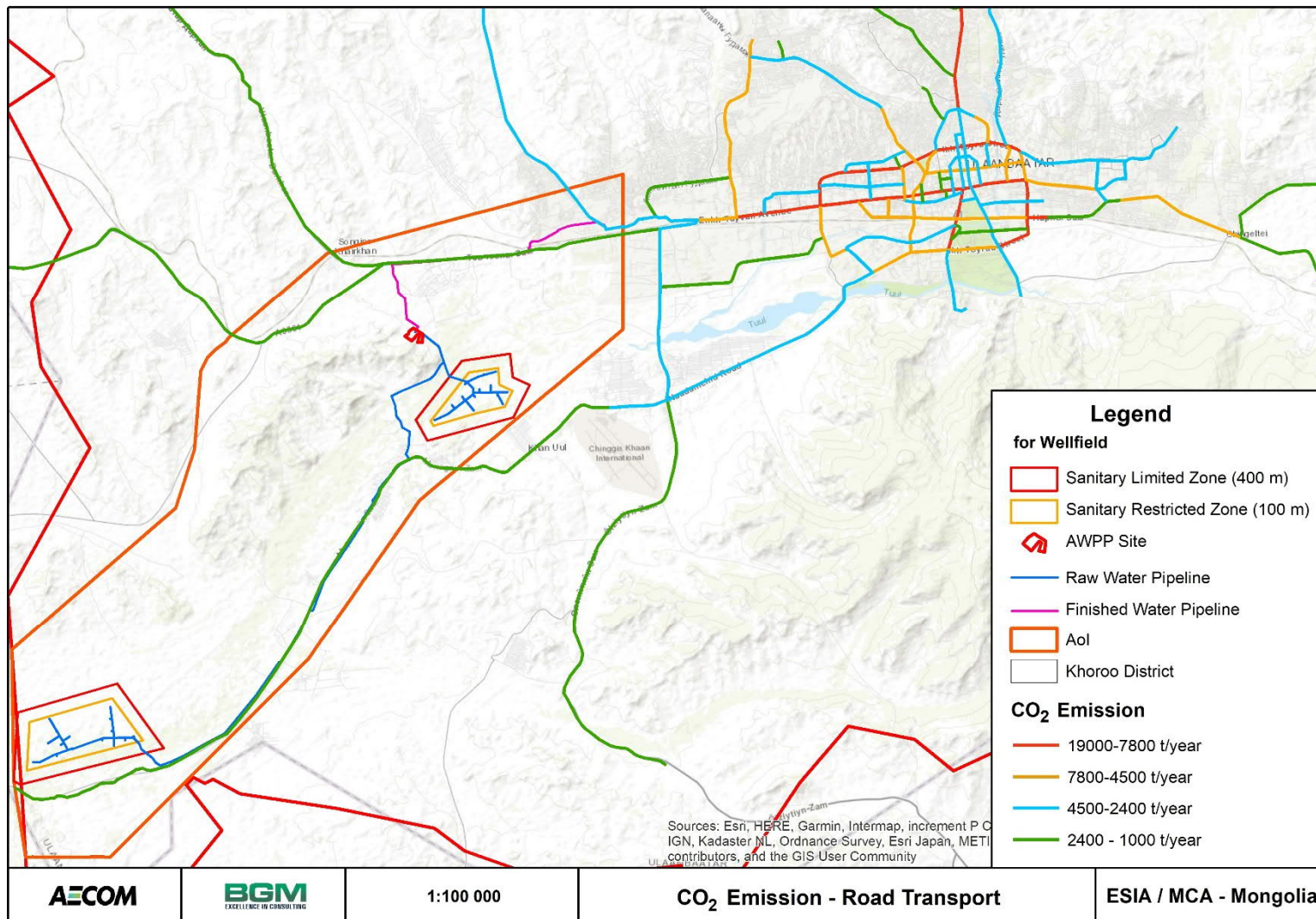


Figure 7-1 CO<sub>2</sub> Emissions from Road Transport in UB (Source: JICA, 2017; Baasankhuu, 2020)

## Greenhouse Gas Emissions During Operations:

During operations, the vast majority of GHG emissions will be due to the high consumption of electrical energy and, from September 15 to May 15, of piped heat. Peak loads for power and heat are provided in the design documents, and are summarized in Table 7-21

**Table 7-21 Power and Heat Load for the BWSE Project**

BWSE Component	Initial (Phase I) [kW]	Final (phase II) [kW]
<b>AWPP power load</b>	5921.0	7441.0
<b>AWPP heat load</b>	2205.1	2612.2
<b>Conveyance power load</b>	3515.6	3515.6
<b>Conveyance heat load</b>	235.0	235.0

The peak loads are consumed during maximum treatment capacity at AWPP and maximum pumping for conveyance. During phase I, AWPP will provide a maximum of 109,000 cubic meters of treated water per day, this will increase to a maximum 135,000 cubic meters per day if and when phase II is implemented. The maximum conveyance rate will be 140,000 cubic meters of raw water per day. Based on these maximum volumes and maximum power loads, specific electrical power consumption per meter cubed of treated water has been estimated as shown in Table 7-22.

**Table 7-22 Specific Energy Consumption**

Specific energy consumption per cubic meter [kW/m <sup>3</sup> ]:	
<b>Conveyance</b>	0.603
<b>Treatment:</b>	
- phase I	1.304
- phase II	1.323

The real consumption of power and heat will fluctuate greatly depending on volumes treated; which is a function of water demand. Not being able to adequately forecast this, we have assumed that the AWPP will be operating on average at “firm capacity,” that is to say with one treatment train not operating. For phase I firm capacity is 75,000 cubic meters of treated water per day and for phase II it is 125,000 cubic meters per day. Given the extreme climate of Mongolia, heat is required from September 15<sup>th</sup> to May 15<sup>th</sup> every year. At the AWPP, this will be provided by piped hot water from the District Heat System. This has the advantage of being more efficient in terms of cost and GHG emissions than electrical heat. For the conveyance system, given its extensive territorial distribution and distance from the heating supply, heat will be electrical, with a maximum electrical power load of 235 kW. Therefore, at firm capacity, annual electrical energy consumption of BWSE, including treatment and conveyance is shown in Table 7-23.

**Table 7-23 Annual Electrical Energy**

Annual Electrical Energy – Treatment and Conveyance	
<b>Phase I</b>	52,187,172 kW.h
<b>Phase II</b>	87,851,792 kW.h
<b>Conveyance heat (235 kW all day for 240 days)</b>	1,353,600 kW.h

Heat consumption, from September 15 to May 15, has been conservatively assumed at full load all winter (see Table 7-24).

**Table 7-24 Annual Piped Heat Consumption**

Annual Piped Heat Consumption – Treatment		
<b>Treatment – phase I</b>	2,205.1 kW all day for 240 days	12,701,376 kW.h
<b>Treatment – phase II</b>	2,612.2 kW all day for 240 days	15,046,272 kW.h

GHGs for combined heat and power plants in UB are shown in Table 7-25 (Namkhainyam and Tsolmon, 2014):

**Table 7-25 Conversion factor for Electricity and Heat**

Components	Conversion factor
<b>Electricity</b>	1.1 kg CO <sub>2</sub> /kW.h
<b>Heat</b>	418 kgCO <sub>2</sub> /gigacalorie = 0.36 kg CO <sub>2</sub> /kW.h

GHG emissions are estimated separately for electrical energy and heat, and total emissions are estimated as the sum of the two components as shown in Table 7-26 .

**Table 7-26 CO<sub>2</sub> Emissions from Electricity and Heat Load**

CO <sub>2</sub> Emissions [tonnes CO <sub>2</sub> /year]	
<b>Conveyance electric heat</b>	1,489
<b>Treatment – phase I</b>	57,406
<b>Heat – phase I</b>	4,568
<b>Treatment – phase II</b>	96,637
<b>Heat – phase II</b>	5,411
<b>Total – phase I</b>	<b>63,463</b>
<b>Total – phase II</b>	<b>103,537</b>

A note should be added for standby power generation. The AWPP will be equipped with a standby power generator to provide life-saving power in case of complete power loss. The diesel-fueled generator will provide maximum 2 MW of power for up to 18 hours, time within power should be restored. The calculated CO<sub>2</sub> emissions is shown in Table 7-27.

**Table 7-27 CO<sub>2</sub> Emissions from Standby Generator**

Standby Generator		
<b>Power</b>	2.000	MW
<b>Energy consumption</b>	2.000	MW.h/h
<b>Specific GHG emissions (standby)</b>	0.533	tonnes CO <sub>2</sub> /MW.h for diesel standby generation
<b>Total emissions</b>	19.188	tonnes CO <sub>2</sub> /18-hour day*

### Greenhouse Gas Emissions Project Wide:

A summary of all estimates for GHG emissions from embodied, through construction, to operations are presented in Table 7-28.

**Table 7-28 Project-Wide Estimates of CO<sub>2</sub> Emissions**

GHG Contribution	Value	Unit
Embodied carbon	70,278	tonnes
Emission during construction	1,364	tonnes
Emissions during operation (phase I)	63,463	tonnes/year
Emissions during operation (phase II)	103,537	tonnes/year

With respect to the NDC baseline presented in Section 6.1.5.2, the embodied and construction emissions, taken as a single year lump, represent 0.17 percent of the projected emissions nationwide for 2025, while operations phase annual emissions represent 0.15 percent and 0.12 percent of projected emissions nationwide for 2025 and 2030 respectively.

In terms of GHG reductions, very little can be done about the main contributions – the energy needed to move tonnes of water from the wellfields to the AWPP and then onto the USUG network is defined by physics and motor efficiency. The same is true for the huge volumes of process air needed at the AWPP that need to be changed out frequently and heated. And in UB that energy is available from inefficient coal-powered combined heat and power plants. Some emissions can be curtailed by designing for the most efficient water and air pumps and optimizing the air change rates and its management. This has been the approach taken by the designers.

### 7.5.3.2 Potential Impacts on Air Quality

As discussed in Section 6.1.7.7, there is a current potential source of air pollution due to ongoing gravel mining activities at the proposed Shuvuun wellfield site. Areas where total suspended particles exceeded the limits of MNS 4585:2016 are mainly found near the ongoing gravel mining area in Shuvuun wellfield as discussed in Section 6.1.4.2. However, it should be noted that this impact to air quality is not related to the BWSE project activities.

As shown in Figure 7-2, Figure 7-3, and Figure 7-4, dust and GHG emissions are predicted to be generated during land clearance, earthwork activities and disturbance of soil cover in the Aol, during construction of production wells in Biokombinat and Shuvuun wellfields, during installation of raw and finished water transmission pipelines, and during construction of AWPP facilities. The project activities would cause short-term air pollution during the construction phase which would affect the residential areas near the BWSE project activities.

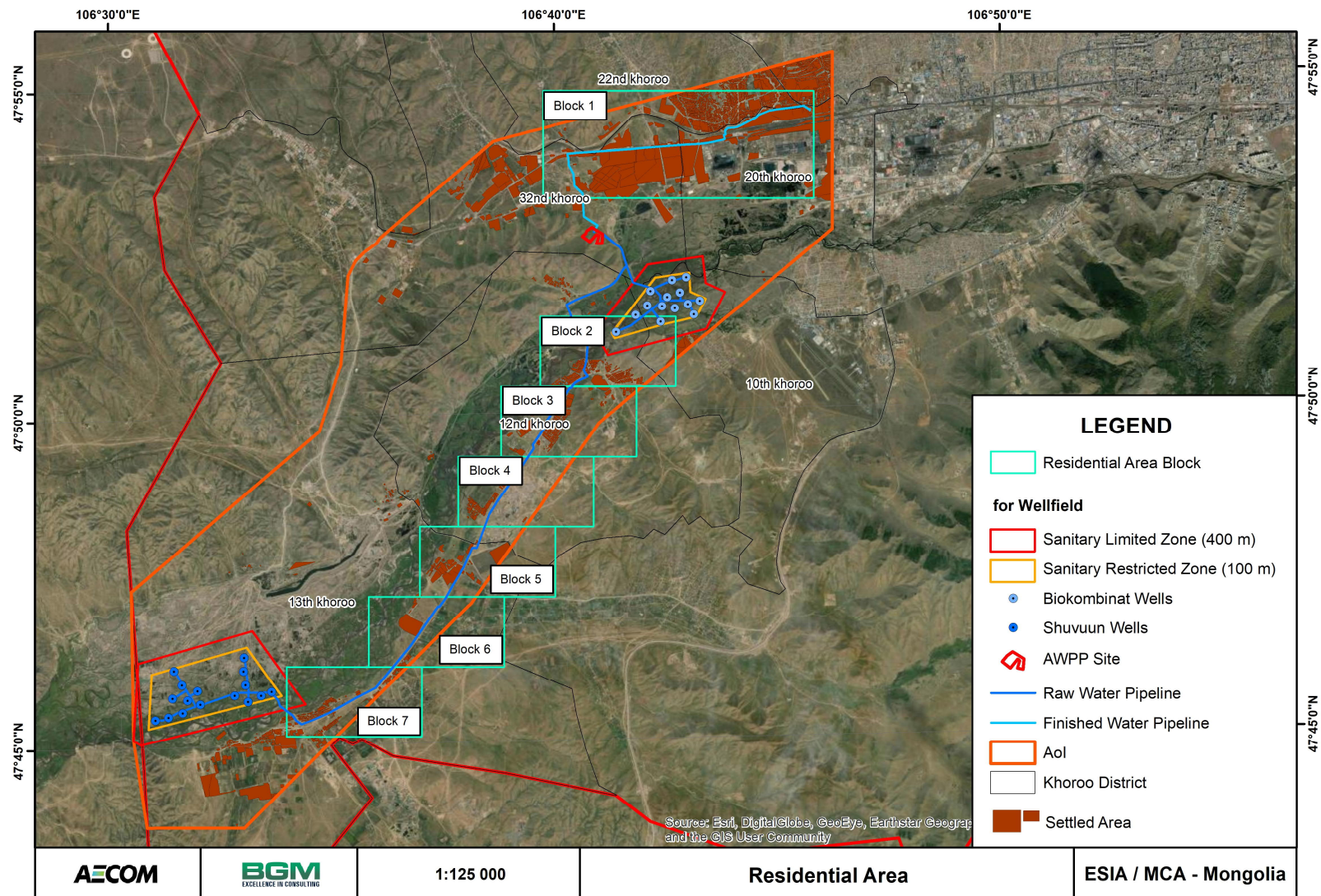
The figures below illustrates the residential areas (see Figure 7-2), which are divided into blocks to identify the potential impacts on air quality in each part of the areas where the BWSE project activities are planned:

- **Block 1:** The earthworks related to construction and installation of the finished water transmission pipelines are planned in this area. There are industrial and service facilities, and residential areas in the area. Also the main AH3 highway going west from Ulaanbaatar passes through this area. Due to the presence of residential areas, receptor sensitivity is high in the area (see Figure 7-3).
- **Block 2:** The Biokombinat settlement center is located in this block. This area would be impacted by dust emissions during the project activities and there are important residential areas with higher density of local population. Receptor sensitivity is high (see Figure 7-3).
- **Block 3:** This block includes the southern part of the Biokombinat settlement, as well as settlements along the north side of the main road to Shuvuun and military facilities in the northwest. The residents living along the main road would be more likely to be exposed to

dust during the construction phase of the project due to their closeness to the works. Receptor sensitivity in the residential area is high (see Figure 7-3).

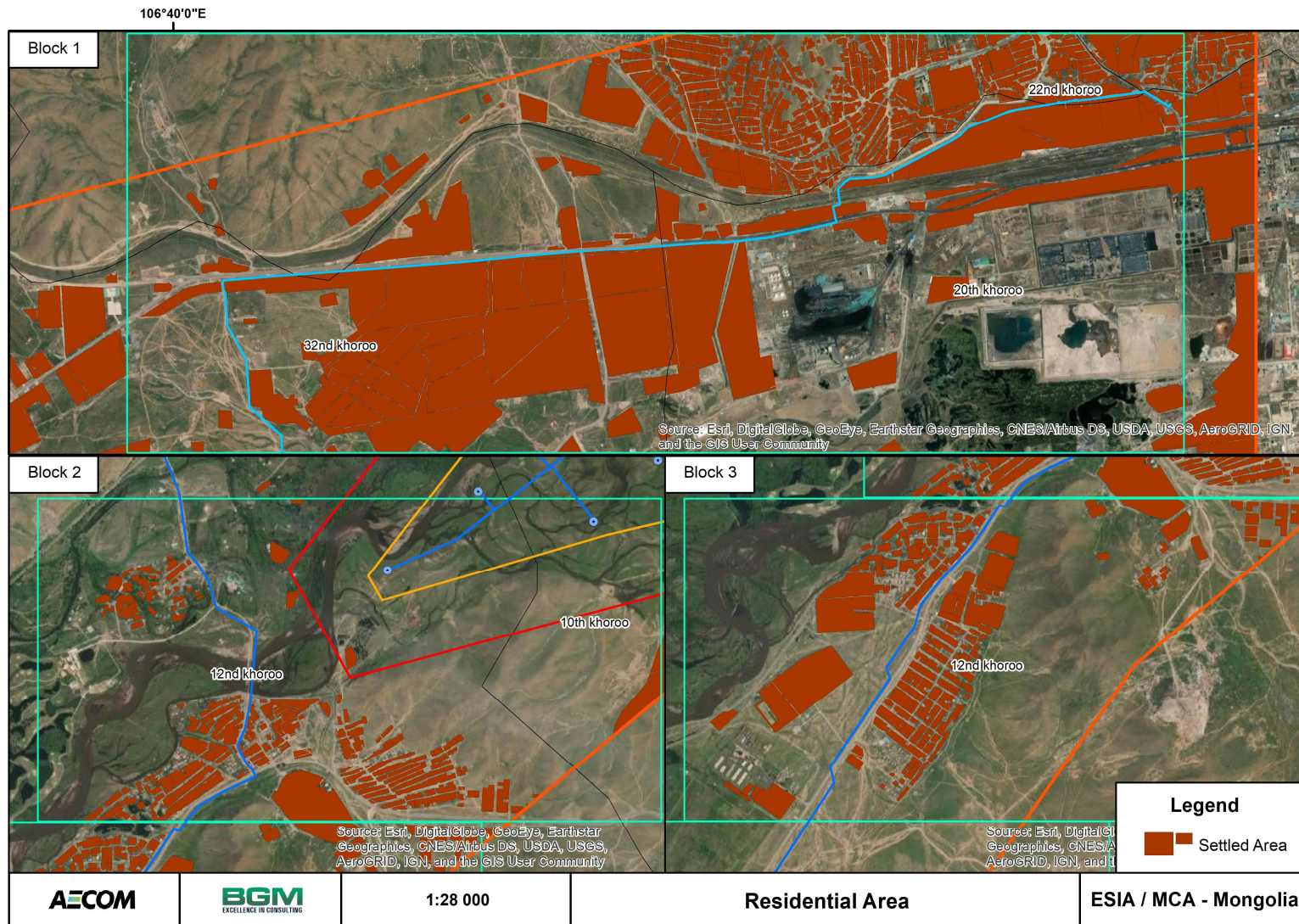
- **Block 4:** The environmental condition in this area has been heavily degraded by a number of gravel mining activities being conducted to the southeast to the main road, as shown in Figure 7-4. Therefore, the existing conditions would become more problematic during the construction of the project facilities, leading to significant deterioration of air quality in this area. However, air quality would improve immediately after the rehabilitation activities of trench as earthwork activities would be occupied in short term. That said, the sensitivity of the receptors in the residential area is considered to be high (see Figure 7-4).
- **Block 5:** This block is very sparsely populated and has a lot of commercial and industrial buildings. Receptor sensitivity is low; however, the commercial and industrial users would be susceptible to project-related air quality deterioration due to their proximity to the construction corridor of raw water pipeline installation (see Figure 7-4).
- **Block 6:** While there is fenced-off industry to the northwest of the road in this block, there are many agricultural plots located to the southeast of the road (see Figure 7-4). If significant air pollution is generated due the project activities in this area, there would be negative impacts on the local community and the health of residents. Receptor sensitivity is high (see Figure 7-4).
- **Block 7:** This block would be affected by the installation of raw water transmission pipelines, which would pass along the household plots northwest of the road. This could adversely affect human health and the daily lives of residents. However, the earthworks and installation of pipelines would take relatively short time. The negative impact on air quality would be mitigated as soon as rehabilitation works are conducted immediately after installation of pipes. However, the current air quality is a concern due to the dust particles blown by the wind from the gravel mining sites (see Figure 7-4).





**Figure 7-2 Residential Area Blocks**





**Figure 7-3 Residential Area**



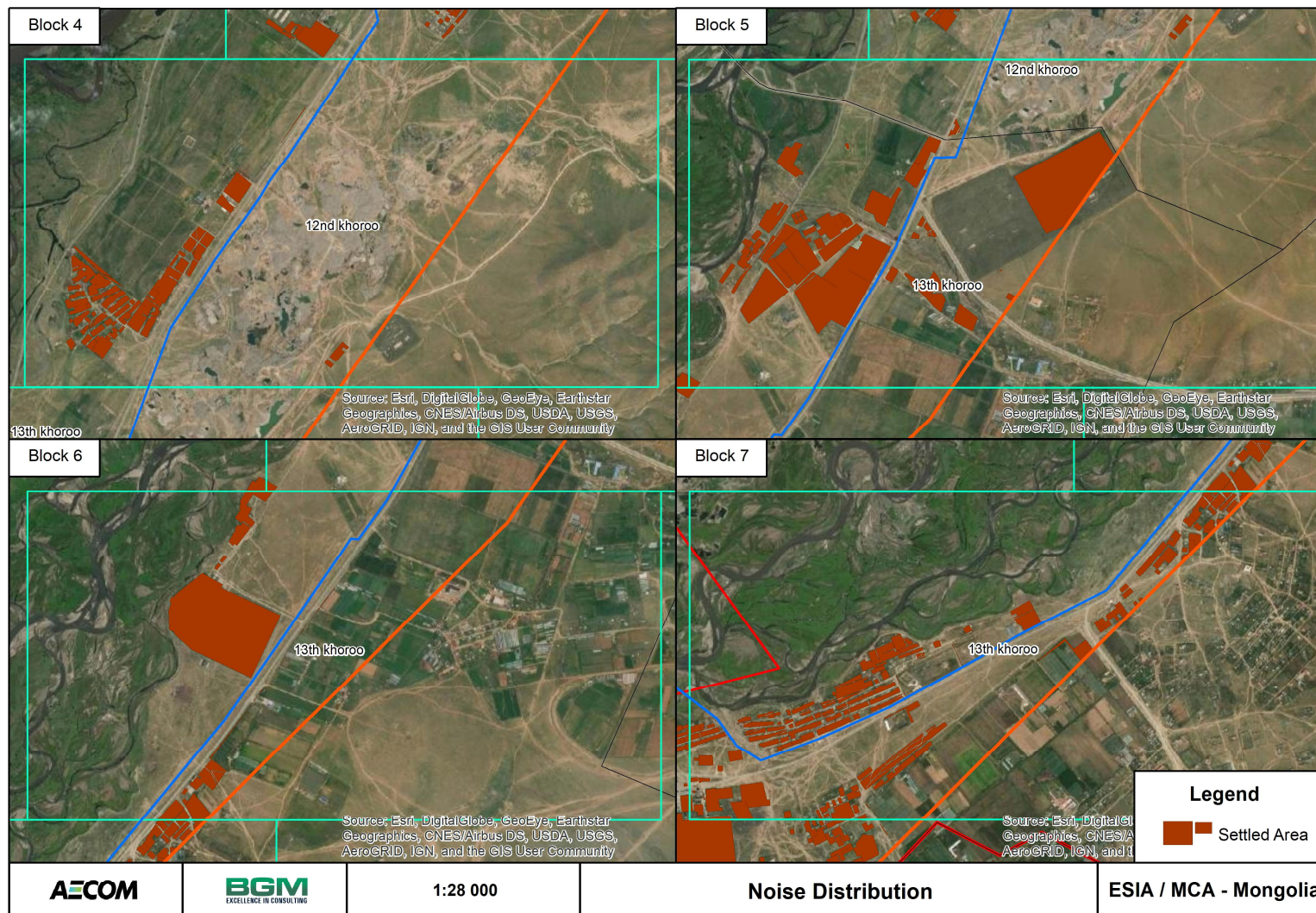


Figure 7-4 Residential Area

## 7.5.4 Pre-Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site

- **Exploratory and Test Well drilling, and Geophysical survey:** These activities occurred at proposed wellfields. The drilling process was expected to cause fugitive dust emissions due to vehicles and trucks driving to and from the site along the unpaved roads leading to the wellfields. Emissions would be generated from the vehicles and drilling equipment. There was no direct impact of dust and emissions to local communities since no local communities are settled at the two proposed wellfields. Therefore, the magnitude of impact would be low for local communities' health, although the receptor sensitivity is high due to exposure to ambient air pollution. This would result in moderate impact significance for local communities' health, if best engineering practices were not employed. However, fugitive dust and emissions from exploratory and test well drilling activities, and geophysical survey would likely be an effect on drillers' and workers' health. Therefore, the magnitude of impact would be moderate for drillers' and workers' health, although the receptor sensitivity is high due to exposure to ambient air pollution. This would result in high impact significance for drillers' or workers' health, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, task hazard assessments and best engineering practices were implemented by the field investigation teams to avoid or minimize potential adverse environmental impacts, thus reducing the anticipated residual impact significance to low.
- **Geotechnical, Topography and Geodesy survey:** These field investigations occurred along the raw and finished water pipelines, at the two proposed wellfields and the AWPP site. Fugitive dust and emissions are generated due to vehicle movement during these surveys. However, these activities occurred temporarily, whereas the spatial extent of the impact is determined as a site scale. This would impact settled local communities along with the raw and finish water pipeline. However, working corridor for these activities are very narrow where density of local communities or households is low. At the proposed wellfields and AWPP site, there was no direct impact to local communities since no local communities are there. Therefore, the magnitude of impact would be low for health of local communities, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in moderate impact significance for health of local communities, if best engineering practices were not implemented. However, fugitive dust and emissions from vehicle movement would likely be an effect on drillers' and workers' health. Therefore, the magnitude of impact would be moderate for drillers' and workers' health, although the receptor sensitivity is high due to exposure to ambient air pollution. This would result in high impact significance for drillers' or workers' health, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan and regulation on operational safety during engineering-geological and geotechnical works of construction, including General Requirements: CR 12-102-04 and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.

Assessment of potential impacts on air quality for the pre-construction phase is summarized in Table 7-29.

**Table 7-29 Assessment of Air quality Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Exploratory and Test well drilling</b>	Dust and emissions from vehicles movement and drilling activities.	Driller and Worker	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Health and safety management plan; Site safety plan; Emergency preparedness plan; Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;	Low
<b>Geophysical survey</b>		Driller and Worker	High			Moderate	High		Low
<b>Geotechnical field survey</b>	Spillage of engine fuel or other chemicals during operations.	Local communities	High			Low	Moderate		Low
<b>Topography and geodesy field survey</b>		Local communities	High			Low	Moderate		Low



## 7.5.5 Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site:

- **Production well drilling:** The production well drilling activities would occur at the proposed Biokombinat and Shuvuun wellfield areas. The key source of air pollution during the drilling activities would be vehicle and drilling equipment emissions. However, there would not be direct impact to local communities in proposed two wellfield areas. Therefore, the emissions source during the drilling activities would be limited, whereas the spatial extent of impact would be at site scale. Only the health of the drillers and workers could be affected by emissions from drilling activities. Therefore, the magnitude of impact would be low for drillers' and workers' health, although the receptor sensitivity is high due to exposure to ambient air pollution. This would result in a moderate impact significance for health of drillers or workers' health, were best engineering practices not employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, application of clean water for dust control, hours of operation, protection of air quality, , , erosion control, traffic control and drilling preparation and performance pump testing (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568 and 01063; Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
    - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
      - a. MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
      - b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
      - c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
      - d. MNS 4931:2000 Protective means. General requirement, classification.
      - e. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
      - f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
      - g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
      - h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
      - i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
      - j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
      - k. Labor code of Mongolia.
      - l. Law of Mongolia on Toxic Hazardous Chemicals
    - 3) The Health and Safety Plan shall include, but not be limited to the following:

- a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
  - b. Identification of hazards and risks associated with the Project.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
- 4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
- 5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
- 6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.
- Paragraph 1.11.H – The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.
  - Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
    - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
    - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers.

Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

- Paragraph 3.05.A – Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.
- Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and

legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer

- Paragraph 3.03.A - Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.
- Paragraph 3.04.A - *Decontamination Before Mobilization*: The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
- Paragraph 3.04.B - *Staging of Well Installation and Construction Materials*: During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable substitute, so the materials will not come in contact with the ground. Materials, tools and casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.
- Paragraph 3.04.C - *Disinfection During Construction*: The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.
- Paragraph 3.04.D - *Temporary Access Tracks and Drilling Platform*: 1) The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer. 2) Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.
- Paragraph 3.04.E – *Water Resource*: Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.

– Paragraph 3.08.A – *Pumping test*:

o 1. Pumping test procedure:

a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.

b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)

c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease, soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.

d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.

e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria are detected, the Contractor shall re-chlorinate and analyze samples as many times as is necessary to obtain negative bacteria results, at no additional cost to Owner.

f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:



- Prior to startup of test (static water level)
- After 30 seconds
- One minute to 10 minutes: once every minute
- Ten minutes to 100 minutes: once every 10 minutes
- One hundred minutes to 4 hours: once every 30 minutes
- Four hours to 12 hours: once every hour
- Twelve hours to shut down: once every 2 hours
- Prior to shutdown of test.

g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.

h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.

i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.

j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.

k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.

○ 2. Pumping equipment:

a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.

b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.

○ 3. Discharge pipeline and flow measurement:

a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.

b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back

into the well being pumped and influence the drawdown readings of the well being tested.

c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.

d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.

e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.

f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.

○ 4. Pumping test records:

a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s) (in liters per second); the orifice head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.

b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.

- **Production well construction:** Dust and vehicle exhaust emissions would be emitted during the construction activities of the production wells at the proposed two wellfields. It should be noted that there would not be direct impact on local communities at the proposed two wellfields since no permanent local communities are settled there. Only the health of the drillers and workers could be affected by emissions due to construction activities. Therefore, the magnitude of impact would be low for health of construction workers, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in a moderate impact significance for health of construction workers in the case of no best

engineering practices employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, application of clean water for dust control, hours of operation, erosion control, protection of air quality, traffic control, cleaning up project site and clearing and grubbing (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568, 01063 and 01710; Division 2 Section 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
  - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
    - m. MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
    - n. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
    - o. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
    - p. MNS 4931:2000 Protective means. General requirement, classification.
    - q. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
    - r. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
    - s. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
    - t. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
    - u. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
    - v. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
    - w. Labor code of Mongolia.
    - x. Law of Mongolia on Toxic Hazardous Chemicals
  - 3) The Health and Safety Plan shall include, but not be limited to the following:
    - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
    - b. Identification of hazards and risks associated with the Project.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Respiratory protection training requirements.
    - e. Levels of protection and selection of equipment procedures.
    - f. Type of medical surveillance program.
    - g. Personal of hygiene requirements and guidelines.
    - h. Zone delineation of the Project site.
    - i. Site security and entry control procedures.
    - j. Field monitoring of site contaminants.
    - k. Contingency and emergency procedures.

I. Listing of emergency contacts.

4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.

6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

- Paragraph 1.11.H – The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.
- Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.05.A – Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
  - Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.

- Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.



3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02230, Site Cleaning
    - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
    - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
    - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
    - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
    - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
    - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
    - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
    - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
  - **Pipeline installation and Tuul River crossing:** During the installation of raw and finished water pipelines, there would be a localized and temporary reduction in air quality as a result of emissions generated from excavator activities for trenching processes. It is considered to be significant, with the potential to affect workers on-site. However, impact on off-site receptors would be minimal given the distance from actual construction working corridor, except for parts of Blocks 1, 2, 3, and 7 due to proximity and local community density. Air quality would also be deteriorated by emissions from heavy vehicles used for transportation

of materials to and from the site and at the site. These emissions would not be expected to be significant.

- However, duration of these activities would be short term (i.e. limited to construction period) and the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for health of workers and local communities, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in high impact significance for health of construction workers and local communities without the application of best engineering practices employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, application of clean water to control of dust, hours of operation, protection of air quality, , erosion control, hours of construction, and safeguarding open excavations, traffic control, cleaning up project site (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568, 01046, 01063 and 01710), and clearing and grubbing and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02210 and 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
    - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
      - a. MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
      - b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
      - c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
      - d. MNS 4931:2000 Protective means. General requirement, classification.
      - e. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
      - f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
      - g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
      - h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
      - i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
      - j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
      - k. Labor code of Mongolia.
      - l. Law of Mongolia on Toxic Hazardous Chemicals
    - 3) The Health and Safety Plan shall include, but not be limited to the following:
      - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
      - b. Identification of hazards and risks associated with the Project.

- c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
- 4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
- 5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
- 6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.
- Paragraph 1.11.H – The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.
- Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

- Paragraph 3.05.A – Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.
- Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
    - Section 01046, Control of Work
  - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
  - Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for

access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.

- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
    3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and



adjacent property affected by its operations in a neat and satisfactory condition.

4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

o Section 02210, Earth Excavation, Backfill, Fill and Grading

- Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
- Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
- Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.

- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.

- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- **Land clearance and earthworks for facilities of the BWSE project:** The facilities of the BWSE project would include buildings for AWPP, brine sewer, production well pumphouses, and 10 kilovolt power distribution lines. Dust emissions due to project activities (e.g. trenching along to pipeline and earthwork at AWPP site) are estimated by using AERMOD air dispersion model, informed by local meteorological factors (e.g., wind direction and speed and so on) and it shown in Figure 7-5, Figure 7-6 and Figure 7-7. Results of modelled PM10 showed that dust emissions during the project activities would not exceed 100 micrograms per cubic meter, as per MNS 4585:2016, and 150 micrograms per cubic meter, as per IFC EHS guidelines. However, it is important to note that large areas around the sites of the abovementioned project components is essentially undeveloped. In addition to this, temporary work camps for Contractors would be required. One of the key sources for air pollution by dust in the Aol would be raised due to land clearance and earthworks activities prior to the construction activities for BWSE project facilities. In other words, any existing vegetation would be removed, the soil also would be excavated, stockpiled, graded, leveled, and compact to produce a flat and even ground surface during the land clearance and earthworks activities. Furthermore, the site would be re-landscaped due to site preparation of the AWPP facilities construction. Thus, emissions would cause air pollution during these activities due to the heavy vehicle and equipment operations at the sites. However, duration of this activities would be short term (i.e. limited to construction period). The spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for the health of workers, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in high impact significance for health of construction workers and local communities without the application of best engineering practices. However, Contractor implementation of best engineering practices for site-specific health and safety plan, application of clean water to control of dust, hours of operation, protection of air quality, erosion control, hours of construction, and safeguarding open excavations, traffic control, cleaning up project site (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568, 01046, 01063 and 01710), and clearing and grubbing and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02210 and 02230) would avoid or

minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
  - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
    - y.MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
    - z.MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
    - aa. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
    - bb. MNS 4931:2000 Protective means. General requirement, classification.
    - cc. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
    - dd. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
    - ee. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
    - ff. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
    - gg. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
    - hh. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
    - ii.Labor code of Mongolia.
    - jj.Law of Mongolia on Toxic Hazardous Chemicals
  - 3) The Health and Safety Plan shall include, but not be limited to the following:
    - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
    - b. Identification of hazards and risks associated with the Project.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Respiratory protection training requirements.
    - e. Levels of protection and selection of equipment procedures.
    - f. Type of medical surveillance program.
    - g. Personal of hygiene requirements and guidelines.
    - h. Zone delineation of the Project site.
    - i. Site security and entry control procedures.
    - j. Field monitoring of site contaminants.
    - k. Contingency and emergency procedures.
    - l. Listing of emergency contacts.
  - 4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

- 5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
- 6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.
- Paragraph 1.11.H – The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.
  - Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
    - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
    - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
    - Paragraph 3.05.A – Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
    - Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.
    - Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
    - Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work



proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01046, Control of Work
  - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
  - Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
  - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
  - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.

- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
    3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
    4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
    5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02210, Earth Excavation, Backfill, Fill and Grading

- Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
- Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
- Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally

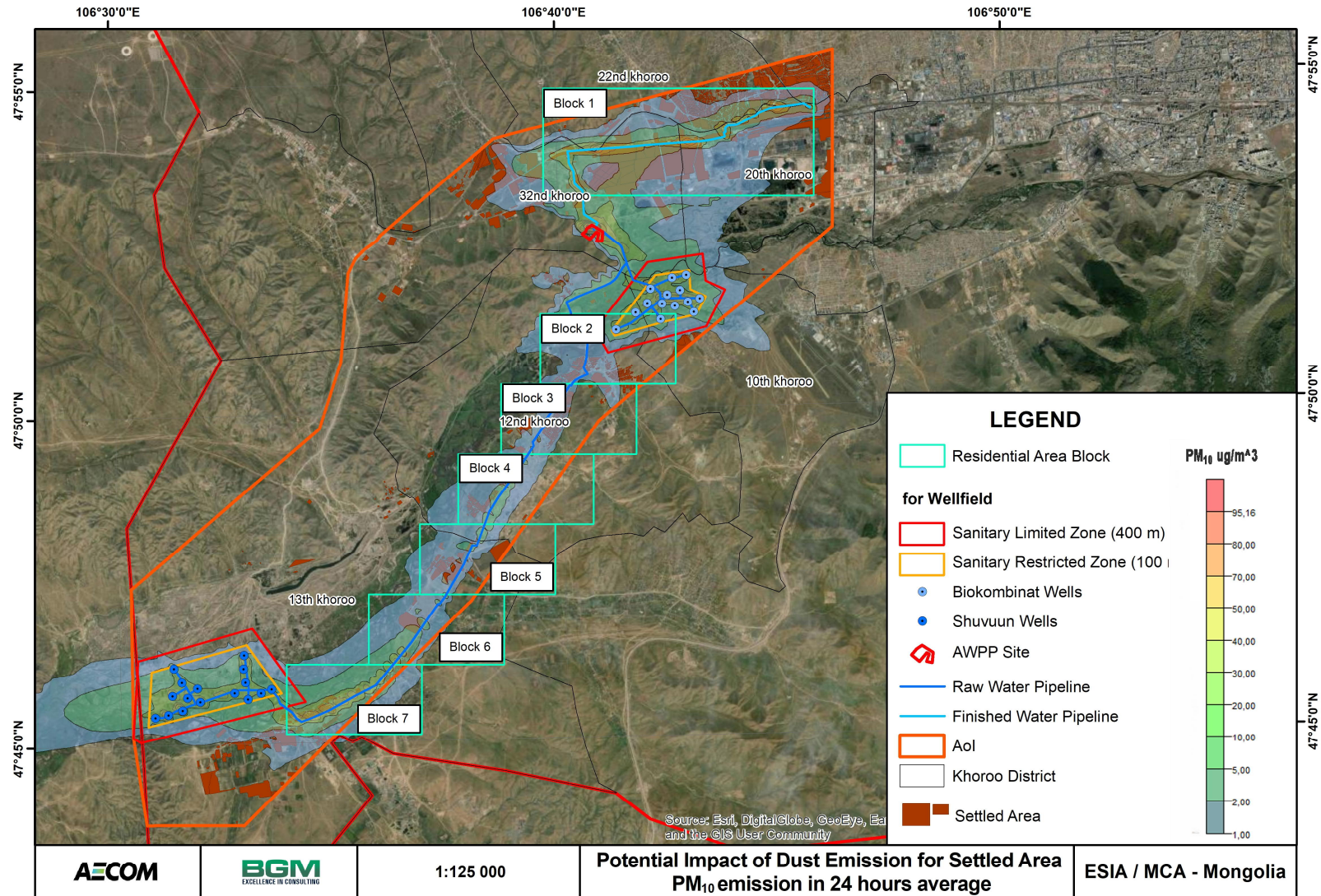
dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed

- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.

- Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
- Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.

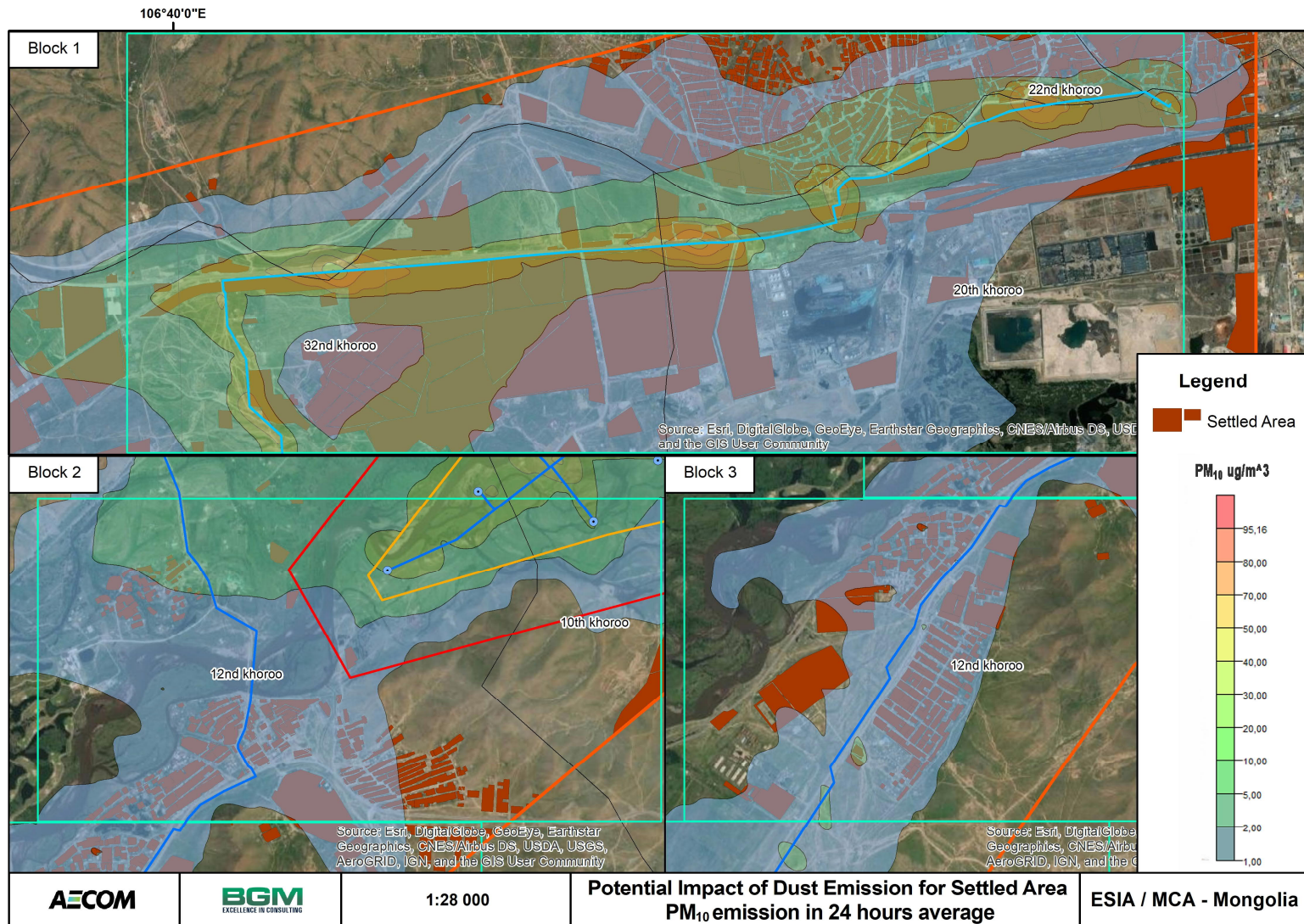
Assessment of potential impacts on air quality during the construction phase is summarized in Table 7-30.





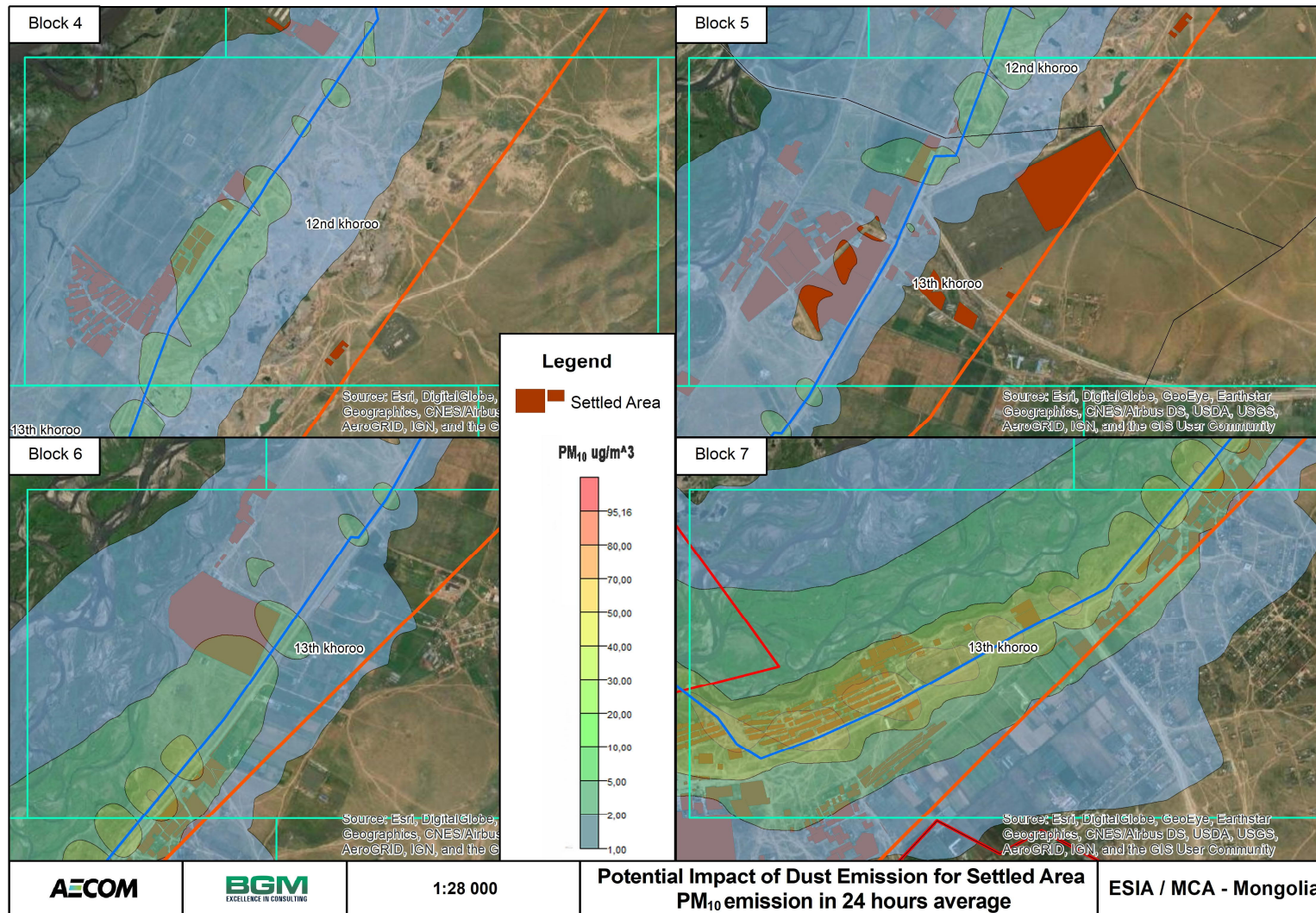
**Figure 7-5 Dust Emission due to Project Activities**





**Figure 7-6 Dust Emission due to Project Activities**





**Figure 7-7 Dust Emission due to Project Activities**

**Table 7-30 Assessment of Air Quality Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
<b>Production well drilling</b>	Release of dust and exhaust emission	Driller and Worker	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Site-specific health and safety plan, Application of clean water to control of dust, Hours of operation, Protection of air quality, Erosion control, Traffic control as specified in technical specifications at Division 1 Section 01030, 01110, 01568 and 01063;  Drilling preparation and performance pump testing as specified Technical specifications at Division 2 Section 02672;	Low
<b>Well construction</b>		Construction Worker	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Site-specific health and safety plan, Application of clean water to control of dust, Hours of operation, Protection of air quality, Erosion control, Traffic control and Cleaning up project site as specified in Technical specifications at Division 1 Section 01030, 01110, 01568, 01063 and 01710;  Clearing and grubbing as specified in Technical specifications at Division 2 Section 02230;	Low
<b>Pipeline installation</b>	Increased air due and dust exhaust emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency:	Moderate	High	Site-specific health and safety plan, Application of clean water to control of dust, Hours of operation, Protection of air quality, Erosion control, hours of construction, and Safeguarding open excavations, Traffic control and Cleaning up project site as specified in technical	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
					Occasionally			specifications at Division 1 Section 01030, 01110, 01568, 01046, 01063 and 01710;	
<b>Tuul River crossing</b>	Deterioration of local air quality conditions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling best engineering practices as specified in technical specifications at Division 2 Section 02210 and 02230)	Low
<b>Construction of AWPP facilities</b>	Exhaust emissions and dust due to Degradation of soil and vegetation	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Site-specific health and safety plan, Application of clean water to control of dust, Protection of air quality, Hours of operation, Erosion control, hours of construction, and Safeguarding open excavations, Traffic control and Cleaning up project site as specified in technical specifications at Division 1 Section 01030, 01110, 01568, 01046, 01063 and 01710;  Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling, Maintenance of seeded areas and planting, and planting operation,	Low



Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								and loaming and seeding best engineering practices as specified in technical specifications at Division 2 Section 02210, 02230, 02480, 02483 and 02485;	
<b>Temporary works camp</b>	Deterioration of local air quality conditions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Field office, Visitor center, Temporary perimeter fence, Temporary electrical, Temporary heat, Temporary sanitary conveniences, Site security, and Shelter and protection of materials, and Cleaning up project site as specified in Technical specifications at Division 1 Section, 01110, 01568 and 01500 and 01700;	Low
<b>Land clearance and earthworks</b>	Release of GHG emissions and dust	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Site-specific health and safety plan, Application of clean water to control of dust, Hours of operation, Protection of air quality, Erosion control, hours of construction, and Safeguarding open excavations, Traffic control and Cleaning up project site as specified in technical specifications at Division 1 Section 01030, 01110, 01568, 01046, 01063 and 01710;  Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling best engineering practices as specified	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								in technical specifications at Division 2 Section 02210, 02230, 02480, 02483 and 02485;	
<b>Air pollution</b>	Not direct release of emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	low	Moderate	Disposal of debris, safeguarding of open excavations, cleanup and disposal of excess material and temporary sanitary conveniences, and protection of air quality as specified in Technical specifications at Division 1 Section 01030, 01046, 01110 and 01500;  Well installation plan as specified in Technical specifications at Division 2 Section 02672;	Low

## 7.5.6 Operation and Maintenance Impacts

- **Groundwater abstraction from wellfields:** Groundwater abstraction from production wells at the two proposed wellfields would not impact air pollution. Therefore, the magnitude of impact would be negligible for air quality. This would result in low impact significance for air quality. Furthermore, Operator implementation of the best engineering practices and management measures consistent with those implemented during construction, as well as compliance with Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, would avoid or minimize any potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Maintenance of pipeline:** The earthwork activities for maintenance of the raw and finished water pipelines would not be anticipated to require removal of all soils along pipelines, as compared with the construction phase. Thus, air pollution would be temporary and limited at site scale. Therefore, the magnitude of impact would be low for workers and local communities, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in moderate impact significance for health of workers and local communities without the application of best engineering practices employed. However, Operator implementation of best engineering practices, consistent with those required during pipeline installation, as well as compliance with MNS 5918:2008, MNS 5914 : 2008 and MNS 5916 : 2008, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.
- **Access road:** Access road to proposed two wellfields, AWPP and ovoo would be constructed or enhanced during the construction phase. It is important to note that paved road would be used to access to AWPP site during the operation and maintenance phase. Emissions would be generated from the vehicles used for transporting operators and workers to and from the site. Despite the potential impacts on air quality, the frequency of the occurrences would be minimal and therefore would be generally considered to have a low impact. Additionally, access roads could be contaminated via vehicle movements, potential spills, leakages and accidents. However, this would be temporary and site scale. Therefore, the magnitude of impact would be low for the health of workers and local communities, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in moderate impact significance for health of workers and local communities without the best engineering practices employed. However, Operator implementation of the best engineering practices and management measures consistent with those implemented during construction would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Solid and liquid disposal:** The residual handling facilities at AWPP would be constructed under the design control during the construction phase. Final brine flow from the AWPP operation would be disposed using brine disposal sewer to the new planned CWWTP effluent channel, which discharges to the Tuul River. AECOM has estimated that the brine discharged would comply with MNS 4943:2015 for discharge to surface water bodies. Solid waste generated during the construction phase may negatively impact the site if handled inappropriately, but Operator will be required to ensure that any solid wastes generated by the operation activities are handled appropriately. Therefore, no direct impact on air pollution would be expected. Thus, the magnitude of impact would be low for the health of workers and local communities, while the receptor sensitivity is high due to exposure to ambient air pollution. This would result in moderate impact significance for the health of workers and local communities without the best engineering practices employed. However, Operator implementation of the best engineering practices and management measures consistent with those implemented during construction, as well as compliance with MNS 4943:2015 and MNS 6458:2014, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.

Assessment of potential impacts on air quality during the operation and maintenance phase is summarized in Table 7-31.

**Table 7-31 Assessment of Air Quality Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Groundwater abstraction from Wellfield</b>	Not direct release of emissions	Local communities	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development;	Negligible
<b>Maintenance of pipeline</b>	Exhaust emissions and dust due to Degradation of soil and vegetation	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practice implemented during pipeline installation; MNS 5918:2008-The General Technical Requirements for Vegetation of Eroded Land; MNS 5914 : 2008-Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions; MNS 5916 : 2008- Topsoil stripping and storage during earthworks;	Low
<b>Access road</b>	Deterioration of local air quality conditions due to release of exhaust emissions and dust	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures	Negligible



Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
					Frequency: Occasionally			implemented during construction.	
<b>Air pollution</b>	Not direct release of emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Low/Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.; MNS 4943:2015- Effluent Wastewater Quality Standard; MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals;	Negligible

The potential impacts from the BWSE project activities to air quality have been identified and summarized in Table 7-29, Table 7-30 and Table 7-31.

As shown in Table 7-29, Table 7-30 and Table 7-31, the potential impact to air quality in the Aol are likely to arise primarily during construction activities of the raw and finished water pipelines, wellfields, AWPP facilities, and temporary facilities such as workers camps.

In addition to this, operations and maintenance activities related to the BWSE project would be limited. Where required, these activities would involve routine inspections, maintenance and monitoring of the production wells, pipelines and AWPP activities. As a result of the impact assessment of air quality due to BWSE project activities, the significance of the residual impacts on air quality would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

## 7.6 Tuul River Hydrology and Water Quality

The UB territory belongs to the Arctic Basin in the world hydrological system and, of the 29 river basins in Mongolia, to the Tuul and Kharaa River basins. The BWSE project components would be located downstream of UB in the upper Tuul river basin. Thus, the Kharaa river basin is not designated as surface water bodies affected by the BWSE project activities.

A healthy river in terms of the good quality and abundance of surface water resources provides good ecosystem services for the aquatic ecosystem, environmental components (e.g. flora and fauna) and local communities. Thus, the impact significance of any potential impact on the Tuul River surface water resource and quality would depend on the current use of the resource or its importance to ecology, and on the nature and magnitude of change caused by the BWSE project activities.

### 7.6.1 Surface Water Receptor Sensitivity

The potential impacts on the Tuul River surface water body baseline conditions are focused on in this section. In other words, potential impacts, where changes to the baseline conditions due to the BWSE project activities, were considered in assessing the sensitivity of the primary Tuul River surface water receptors. The classification of receptor sensitivity for Tuul River surface water is described in Table 7-32.

**Table 7-32 Surface Water Receptor Sensitivity**

Receptor Sensitivity	Description
<b>Negligible</b>	This category is considered non-applicable to surface water.
<b>Low</b>	The surface water resource, because highly polluted, is of low interest with regard to environmental components such as flora and fauna. In other words, the surface water resource and sediment in riverbed have no role in providing services for the aquatic life, wildlife, local community use or only used for low-grade industrial use.
<b>Moderate</b>	The surface water resource has local importance in terms of providing services for environmental components and local communities, but there is an adequate opportunity for alternative resources. In other words, the surface water resource and sediment in the riverbed with some pre-existing pollution that limits their use or value for aquatic life, wildlife and local communities.
<b>High</b>	The surface water resource represents a vital component for an area or a species valued or designated for its ecological importance at the local, national and international levels. In other words, the surface water resource and sediment in the riverbed are of high quality, i.e. close to its natural quality without pollution.

Figure 7-8 shows the BWSE project components and the local hydrogeological conditions. The Quaternary-Holocene alluvial aquifer is the main and most reliable water source in the Aol for the proposed Shuvuun and Biokombinat wellfields. Groundwater from the Pleistocene-Holocene alluvial aquifer contributes to the Quaternary-Holocene alluvial aquifer. Groundwater in the Pleistocene-Holocene alluvial aquifer is fed by infiltration of precipitation falling in the watershed, and unevenly distributed groundwater flow originating from the metamorphic-sedimentary rocks distributed at higher elevations (e.g., Songinokhairkhan Mountain).

This implies that the riparian zone of the Tuul River is more critical than the neighboring uplands in terms of hydrogeological settings and hydrological connectivity for the local hydrological cycle of the Aol. Therefore, the Aol, in terms of hydrological processes, can be distinguished into a riparian zone of the Tuul River and an upland zone in consideration of the hydrogeological features and local hydraulic or topographic gradients.

Riparian zones are widely recognized for their role in stream protection, conservation of biodiversity, and critical hydrological processes (Gregory et al., 1991, Hongyong et al., 2016, Christopher and Carolyn, 2017). In addition, the riparian zone has high water content in the soil due to high hydrological connectivity and the presence of a water source compared to the uplands in the Aol.

The riparian zone of the Tuul River in the Aol comprises all streams that flow over the Quaternary-Holocene alluvial and Pleistocene-Holocene alluvial aquifer within the Aol. The upland zone comprises the metamorphic-sedimentary rocks distributed at higher elevations (see Figure 7-8).

The riparian zone of Tuul River would be of high receptor sensitivity due to its good hydrological connectivity role in the interaction between Tuul River surface water and groundwater in the Aol. In addition to this, the riparian zone is structurally prone to relatively low resilience to impact and contamination through surface spills as well.

On the other hand, the upland zone would be of moderate to high receptor sensitivity due to its importance to the interaction between Tuul River surface water and groundwater in the Aol. The upland zone is relatively resilient to contamination through surface spills compared to the riparian zone.

## 7.6.2 Surface Water Impact Magnitude

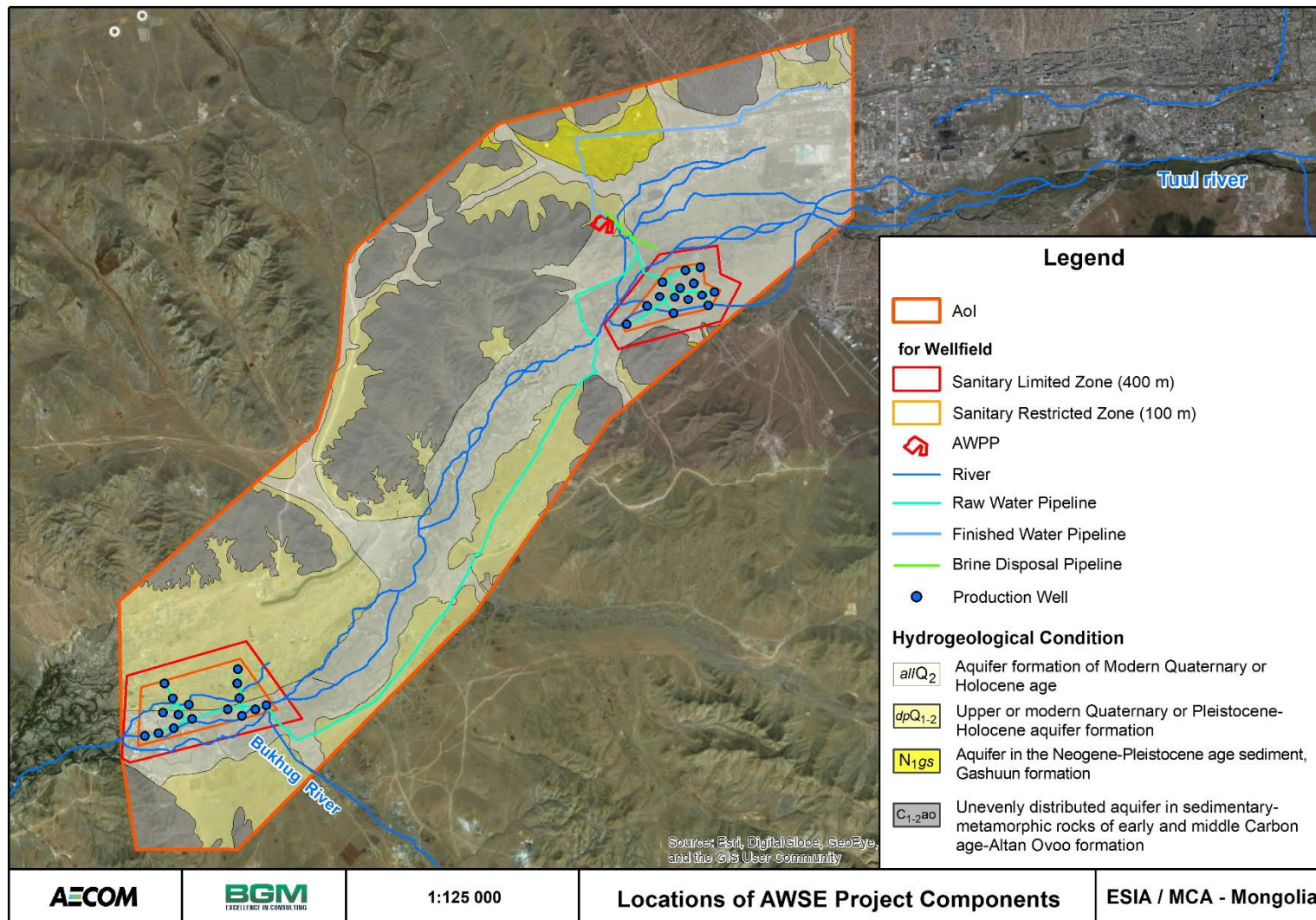
The magnitude of impact of the potential impacts on Tuul River surface water is determined generally in terms of the extent of changes to the Tuul River flow regime and water quality. Changes to Tuul River surface water and sediment quality may lead to an adverse impact on groundwater quality along the Tuul River valley. Main activities of the BWSE project and associated pathways include the following:

- Direct changes in the flow regime of Tuul River surface water (e.g. groundwater abstraction)
- Direct and indirect changes in contaminants in the groundwater (e.g. direct water abstraction)
- Direct and indirect changes in the interaction of Tuul River surface water and groundwater (e.g. direct water abstraction)

Descriptions of the criteria used to classify magnitude of potential impacts for surface water are presented in Table 7-33.

**Table 7-33 Ranking of Magnitude of Surface Water**

Ranking of magnitude	Description
<b>Negligible</b>	No changes distinguishable from natural variability.
<b>Low</b>	Water quality, quantity and condition of the watercourse is predicted to recover rapidly through natural processes and the duration of impact is short (limited to the Construction and Pre-Construction Phases).
<b>Medium</b>	Water quality, quantity and the condition of the watercourse is likely to recover through natural processes and the impact is predicted to be medium term (up to 5 few years).
<b>High</b>	The potential for natural recovery of water quality, quantity and/or physical disturbance through natural processes is limited and the impact is predicted to be long term (up to 10 years).



**Figure 7-8 The Location of BWSE Project Components**



### 7.6.3 Assessment of Potential Impacts on Water

The magnitude of impacts has been assessed against the impact magnitude criteria presented in

Table 7-33. This has been combined with the receptor sensitivity assessment using the matrix approach discussed in Section 3.

As mentioned in Section 6.1.8, drinking water supplies in UB city are completely dependent on groundwater sourced from production wells located in the alluvial plain of the Tuul River, which flows through UB city. The main source of the Tuul River flow is rainfall during the warm seasons and the flow varies depending on season and location. The average flow of the Tuul River near UB city is 23.8 cubic meters per second and the river flow is about 6 percent from snowmelt, 69 percent from rainfall, and 25 percent from groundwater (Byambakhuu et al., 2016).

The BWSE project would develop Biokombinat and Shuvuun wellfields to ultimately supply 50 million cubic meters per year of raw untreated water. By providing this additional supply, the BWSE would partially address the anticipated shortfall in water supply capacity by increasing groundwater withdrawals from the proposed two wellfields. Thus, the potential impacts on Tuul River surface water are considered changes in terms of water quantity and quality.

Therefore, Tuul River surface water quantity was assessed based on the assessment of Tuul River surface water and groundwater interaction during the groundwater abstraction from production wells at the two proposed wellfields. In other words, to determine whether full wellfield production would impact the number of near-zero flow days (defined as days with river flows less than 100,000 m<sup>3</sup>/day) in the Tuul River. The assessment of Tuul River surface water and groundwater interaction was conducted using a groundwater modeling system as part of the hydrogeological investigations performed in 2019 (AECOM, 2019a). The objective of the groundwater modeling was to have a clear understanding of the dynamic relationship between the Tuul River surface water and groundwater. The MODFLOW groundwater model was updated and applied by AECOM to simulate the effect of increased pumping on flows in the Tuul River.

The MODFLOW groundwater model validation was performed by comparing model results to synoptic water levels collected on October 4, 2019. Once the model was updated and validated, the groundwater model was used to assess the impacts of groundwater abstraction from Biokombinat and Shuvuun wellfield on Tuul River surface water and these simulations include:

- **Evaluation of Near-Zero Flow Days:** Relative to the Tuul River, a model simulation was performed to determine whether full wellfield production would impact the number of near-zero flow days in the river (defined as days with river flows less than 100,000 m<sup>3</sup>/day, as for previous assessments). The model showed that wellfield withdrawals would not cause additional near-zero flow days in the Tuul River downstream of both wellfields. One reason is that much of the pumped flows are returned to the river through the wastewater treatment plant outfall.
- **Well Drawdown:** Relative to well drawdowns, Decree No. A-173 approved by MET specifies the following:
  - *In order to preserve the ecological balance and ensure the normal recharge conditions, natural ground water resource volumes between 0.3 and 0.5 can be used (meaning 30 to 50% of the total ground water volume).*
  - *In order to preserve the ecological balance and ensure normal recharge conditions, under the unconfined aquifer conditions, the maximum acceptable amount of the drawdown cannot exceed 40 to 60% of the total aquifer thickness. In case of the confined aquifer, the drawdown is to be equal to the underground water head.*

Based on input from Mongolian professionals, it was determined that the lower percentages apply to the end of the dry season, when the groundwater levels are the lowest and, therefore, drawdowns should be minimized.

Conversely, the higher percentages apply to the end of the wet season. For both dry and wet season assessments, the reference groundwater levels (from which drawdowns and aquifer

thicknesses are calculated) would be the levels at the corresponding times for the no-pumping scenario.

The MODFLOW groundwater model is not geared to the calculation of aquifer volumes and, therefore, the assessment was made on drawdowns but using a 30 percent limit to address the volume criterion. The drawdown ratios vary from well to well in each wellfield.

It would take numerous model runs (several hours per run), adjusting well flows to meet the 30 percent drawdown ratio. Therefore, within each wellfield, the dry season (<30 percent) and wet season (<50 percent) criteria were applied to the 90<sup>th</sup> percentile drawdown ratio, i.e., the drawdown ratio not exceeded at more than 10 percent of the wells in the wellfield.

The groundwater model simulations confirm that groundwater abstraction from Biokombinat and Shuvuun wellfield would not result in additional days of near-zero flows in the Tuul River as shown in Table 7-34. Near-zero flow of Tuul River is defined as flows less than 100,000 m<sup>3</sup>/day.

**Table 7-34 Additional Near-Zero Flow Days for Each Option**

Option	Additional Near-Zero (<100,000 m <sup>3</sup> /day) Flow Days		
	Downstream of Biokombinat	Downstream of Biokombinat	Downstream of Biokombinat
<b>Future Design Flows</b>	0 / 0	0 / 0	0 / 0
<b>Flows Developed by Prestige</b>	0 / 0	0 / 0	0 / 0

The groundwater model simulations showed drawdown to be within/below criteria for all wells during both the high and low recharge seasons as shown in Table 7-35. The simulations were also reviewed to provide information regarding changes in Tuul River surface water flows across each wellfield due to groundwater abstraction.

Upstream and downstream Tuul River flows were compared during both the dry and wet seasons and under conditions of both no pumping and pumping at design flows (68,493 m<sup>3</sup>/day per wellfield).

As shown on Table 7-36, in Biokombinat, all scenarios show that groundwater continues to discharge to the Tuul River. In Shuvuun, there is one scenario (pumping during the dry season) where the Tuul River is recharging the groundwater.

**Table 7-35 Drawdown Ratios for Future Withdrawals**

Criterion	Dry Season		Wet Season	
	<30%		<50%	
Well Field	Well Field Average	90 <sup>th</sup> percentile	Well Field Average	90 <sup>th</sup> percentile
<b>Future Design Flows</b>				
<b>Biokombinat</b>	10%	12%	3%	4%
<b>Shuvuun</b>	4%	5%	4%	5%
<b>Calculated Flows</b>				
<b>Biokombinat</b>	9%	12%	3%	4%
<b>Shuvuun</b>	4%	6%	4%	6%

**Table 7-36 River Flow Rates at Each Wellfield**

Location	River Flow Rate (m <sup>3</sup> /day)			
	Dry Season		Wet Season	
	No Pumping	Pumping (Design Flows)	No Pumping	Pumping (Design Flows)

<b>Tuul River Upstream of Biokombinat</b>	0	0	5,157,237	5,148,651
<b>Tuul River Downstream of Biokombinat</b>	81,397	76,659	5,301,232	5,254,951
<b>Downstream minus Upstream</b>	81,397	76,659	143,995	106,301
<b>Discussion</b>	Groundwater is discharging to river	Groundwater is discharging to river, but at lower amount than when not pumping	Groundwater is discharging to river	Groundwater is discharging to river, but at lower amount than when not pumping
<b>Tuul River Upstream of Shuvuun</b>	125,143	197,786	9,593,122	9,638,430
<b>Tuul River Downstream of Shuvuun</b>	133,671	148,793	9,704,660	9,690,274
<b>Downstream minus Upstream</b>	8,528	-48,993	111,538	51,844
<b>Discussion</b>	Groundwater is discharging to river	River is recharging groundwater	Groundwater is discharging to river	Groundwater is discharging to river, but at lower amount than when not pumping

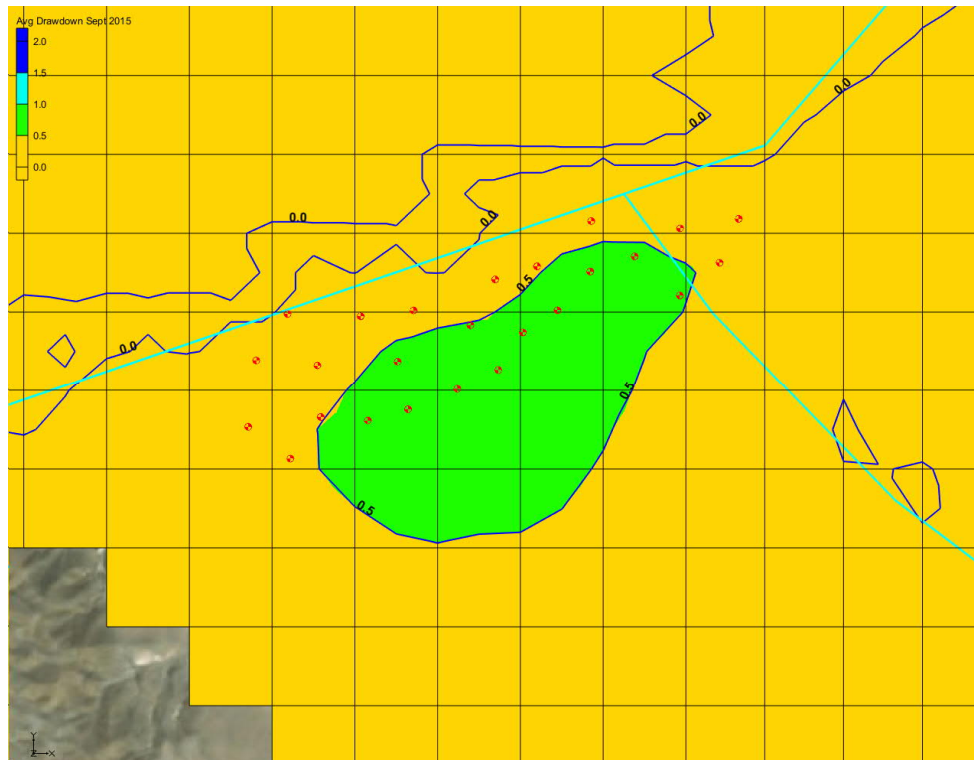
To evaluate drawdown in the area of the Nisekh<sup>57</sup> and Combined Heat & Power Plant<sup>58</sup> wellfields, groundwater model simulations were performed with no pumping at all in the model, and a second scenario simulated pumping with the existing wellfields pumping as well as the proposed Biokombinat and Shuvuun wellfields. In addition to this, existing wellfields locations are not determined in Figure 7-9, Figure 7-10 and Figure 7-11 due to confidential information according to Mongolian law.

Drawdown under average year-round conditions for the Shuvuun Wellfield are shown in Figure 7-9. In general, drawdown in the Shuvuun Wellfield is less than 1 meter across the wellfield under average conditions. Drawdown impacts due to groundwater abstraction from the Shuvuun wellfield do not appear to impact other wells in the area.

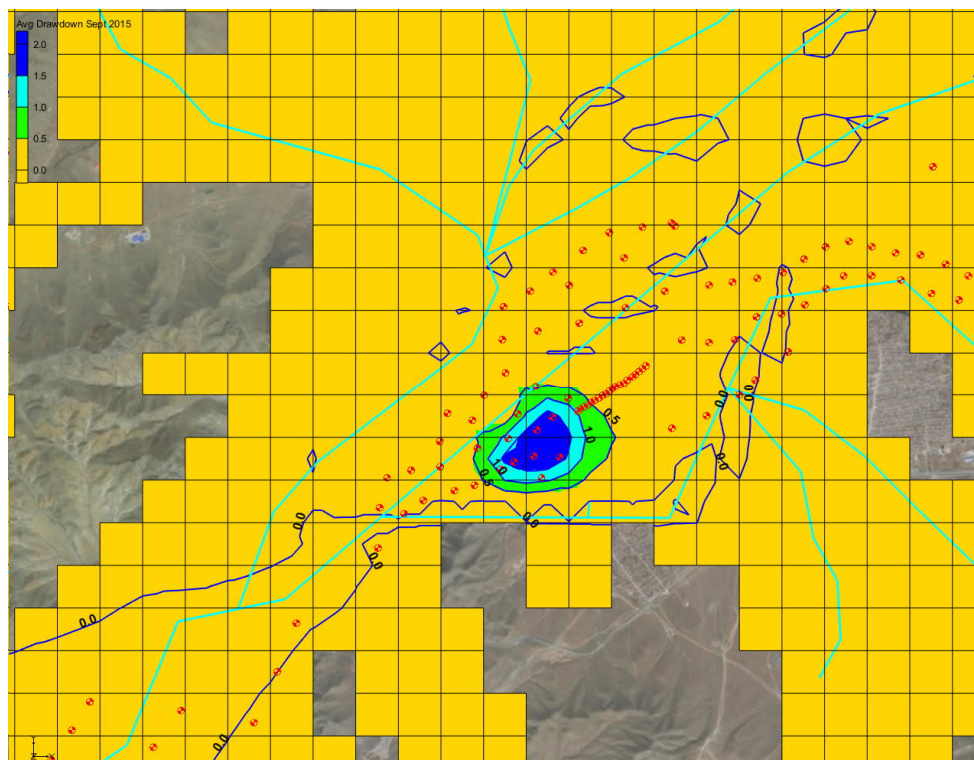
In the Biokombinat Wellfield, the drawdown across the wellfield under average conditions is approximately 0.5 to 1.5 meters as shown in Figure 7-10. During the dry season, drawdown in the vicinity of the Nisekh Wellfield ranges from approximately 0.6 meters at the eastern end of the wellfield, to 1.7 meters in the western end of the wellfield closest to the Biokombinat wellfield.

<sup>57</sup> Nisekh wellfield has been using for drinking purpose of Nisekh area.

<sup>58</sup> Combined Heat and Power plant 3 wellfield and Combined Heat and Power plant 4 wellfield has been using for cooling purpose of CHPs

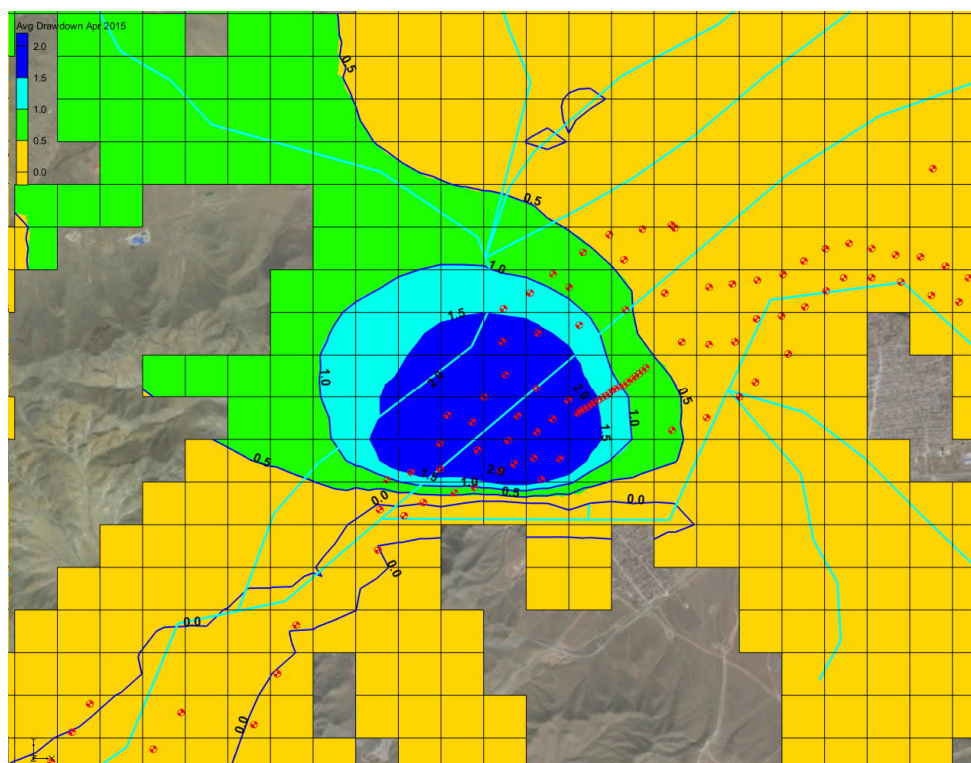


**Figure 7-9 Drawdown Under Average Conditions – Shuvuun Wellfield**



**Figure 7-10 Drawdown Under Average Conditions – Biokombinat Wellfield**





**Figure 7-11 Drawdown Under Low Recharge Conditions – Biokombinat Wellfield**

As discussed in Sections 6.1.9.1 and 6.1.9.2, the findings of the August 2019 surface water sampling confirmed the poor water quality of the Tuul River downstream of the CWWTP effluent outfall and adjacent to the two proposed wellfield sites. In other words, the CWWTP performs poorly, discharging partially treated wastewater to the Tuul River and causing surface and groundwater pollution downstream of the river outfall. In addition to the CWWTP, there are four, comparatively small wastewater treatment plants that also discharge to the Tuul River.

As discussed in Section 6.1.9.3, based on the investigations carried out in 2019, the baseline groundwater quality conditions in the alluvial aquifer are good groundwater quality on the sites, although for some naturally occurring constituents and some bacteriological indicators groundwater quality was not in compliance with MNS 0900:2018. In addition to this, at some wells, the chemical and heavy metal constituents exceeded the recommended water quality standards. Apart from those constituents mentioned above, all other chemicals and heavy metals met the Mongolian MNS 0900:2018 standard.

Therefore, it needs to be noted that the proposed wellfield sites have been subjected to extensive contamination and deliberate technogenic degradation. For example, a potential source of surface and groundwater pollution is ongoing gravel mining activities at the proposed Shuvuun wellfield site, as mentioned in Section 6.1.7.7. Furthermore, as discussed in Section 6.1.9.5, the Tuul River Sediment Sampling Program was carried out to quantify the settled solids and characterize the contaminants in river sediments downstream of the CWWTP effluent discharge (AECOM, 2019b). The findings of this study confirmed that contaminated river sediment would be one of the potential sources of contamination for both surface water and groundwater quality in the Aol.

## 7.6.4 Pre-construction Impacts

### Wellfield, Raw and Finished Water Pipeline and AWPP Site

- **Exploratory and Test well drilling:** Exploratory and test well drilling activities at the proposed wellfields occurred at Quaternary-Holocene alluvial aquifer and the Pleistocene-Holocene alluvial aquifer in Tuul River riparian zone. The drilling activities had direct impacts on topsoil and groundwater aquifer. No direct impact on Tuul River surface water occurred. Therefore, the magnitude of the impact would be negligible for the riparian zone of Tuul River, although the receptor sensitivity is high due to their good hydrological connectivity role for interaction between Tuul River surface water and groundwater in the Aol. This would result in low impact significance for Tuul River riparian zone, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, and task hazard assessments and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.
- **Geophysical survey:** The geophysical investigation at proposed Biokombinat and Shuvuun wellfield have occurred in Quaternary-Holocene alluvial aquifer and the Pleistocene-Holocene alluvial aquifer of Tuul River riparian zone. Topsoil disturbance, removal of vegetation and exposing bare soils is occurred due to the vehicle movement during the geophysical survey. However, these impacts are not direct impact on surface runoff contribution to Tuul River surface water resource. Addition to this, this activity is occurred temporarily. The spatial extent of the impact is determined as a site scale. Therefore, the magnitude of impact would be negligible for the riparian zone of Tuul River, while the receptor sensitivity is high due to their good hydrological connectivity role for interaction between Tuul River surface water and groundwater in the Aol. This would result in low impact significance for the riparian zone, if best engineering practices were not applied. However, health and safety management plan, site safety plan, emergency preparedness plan and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Geotechnical, topography and geodesy survey:** These field surveys has occurred in the riparian zone of Tuul River and the upland zones. No direct impact on Tuul River surface water is occurred during these field investigations. The spatial extent of the impact has determined as a site scale. Therefore, the magnitude of impact would be negligible for the riparian zone of Tuul River, while the receptor sensitivity is high due to their good hydrological connectivity role for interaction between Tuul River surface water and groundwater in the Aol. This would result in low impact significance for the riparian zone, were best engineering practices not applied. Moreover, the magnitude of impact would be negligible for uplands, although the receptor sensitivity is moderate because of their importance to the interaction between Tuul River surface water and groundwater in the Aol. This would result in negligible impact significance for uplands, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan and regulation on operational safety during engineering-geological and geotechnical works of construction, including General Requirements: CR 12-102-04 and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.

Assessment of potential impacts on water for the pre-construction phase is summarized in Table 7-37.

**Table 7-37 Assessment of Water Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Practices	Residual Impact Significance
					Measures	Overall			
Exploratory and test well drilling	Alterations to surface water flow resulting from changes to the vegetation cover and soil compaction.  Spillage of engine fuel or other chemicals during operations.	The riparian zone of Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	negligible	low	Health and safety management plan; Site safety plan; Emergency preparedness plan; Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;	Negligible
Geophysical survey		The riparian zone of Tuul River	High			negligible	low		Negligible
Geotechnical field survey		The riparian zone of Tuul River	High			negligible	low		Negligible
		Upland	Moderate			negligible	negligible		Negligible
Topography and geodesy field survey		The riparian zone of Tuul River	High			negligible	low		Negligible
		Upland	Moderate			negligible	negligible		Negligible

## 7.6.5 Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and the AWPP site:

- **Production well drilling:** The production well drilling activities at the proposed wellfields will occur at the Quaternary-Holocene alluvial aquifer and the Pleistocene-Holocene alluvial aquifer in the Tuul River riparian zone. No direct impact on Tuul River surface water would be expected during the production well drilling activities. Therefore, the magnitude of impact would be low for the riparian zone of the Tuul River, although the receptor sensitivity is high, due to its role in good hydrological connectivity for interaction between Tuul River surface water and groundwater in the Aol. This would result in a moderate impact significance for the Tuul River riparian zone without best engineering practices employed. However, Contractor implementation best engineering practices for detours and road accessibility, erosion control, protection of streams, wetland, and surface water, traffic control, and dewatering, well installation plan, drilling preparation and performance pump testing (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568, and 01063; Division 2 Section 02140 and 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
    - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
    - Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
    - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.

- Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
- Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 02140, Dewatering
  - Paragraph 2.01.F – Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
  - Paragraph 2.01.G – Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
  - Paragraph 3.01.J – Dewatering Discharge:
    1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.



2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
  3. Provide separately controllable pumping lines.
  4. The Engineer reserves the right to sample discharge water at any time.
  5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
    - Paragraph 1.08.A - The Contractor shall submit a Well Installation Plan within 14 days after the Notice to Proceed. The Plan shall contain a description of Contractor's overall approach for the proposed pilot and finished boreholes, and constructing water-supply wells. The Plan shall also include a detailed description of Contractor's proposed means and methods for completing the Work specified herein, including photographs and/or drawings of the proposed equipment, tools, and supplies required to drill, sample, construct, develop, test, pump and inspect the Work.
    - Paragraph 1.08.B - The Well Installation Plan shall be approved and signed by an experienced Professional Hydrogeologist with expertise in water-well design and construction, and by the Engineer.
    - Paragraph 1.08.C The following shall be incorporated into the Contractor's Well Installation Plan and followed in the field. The plan shall include, but shall not be limited to, a discussion of the following:
      1. Proposed pilot borehole drilling, including methods of borehole installation, borehole diameter, soil-sampling, grain-size analysis, borehole geophysical surveying and borehole abandonment. It shall also include samples of the proposed report forms (geologic logs, grain-size analysis, borehole geophysical surveys, etc.)
      2. Description of proposed well-drilling methods for water-supply well boreholes, including methods to overcome well drilling challenges, well-installation procedures, including temporary casings proposed, well casing and screen installation, placement of artificial filter pack, transition pack and seal materials. It is recommended that the Contractor include a detailed description, including photographs, of the drilling rig and equipment proposed to perform the Work.
      3. The Contractor shall prepare a written Drilling Fluids Plan, subject to the review of the Engineer. The Drilling Fluids Plan shall describe the proposed additives to be used in the drilling fluid (for example, soda ash, bentonite, polymer); the proportions of these additives and method of mixing; and the proposed drilling fluid properties (pH, drilling-fluid weight, fluid-loss, viscosity and calcium content). The Drilling Fluids Plan shall also explain how the drilling fluids will work in harmony with the Contractor's drilling equipment with the overall goal of stabilizing the boreholes. The Drilling Fluids Plan shall describe the additives to be used to break down the filter cake once the well screen is installed and well development commences. Finally, the Drilling Fluids Plan shall include the name and experience record of the Drilling Fluids Engineer(s) who will monitor the drilling fluids for optimal performance throughout the drilling and well-construction process. It is recommended that the Contractor include a detailed description, including photographs, of the drilling mud mixing and circulation equipment proposed to perform the Work.

4. In the Drilling Fluids Plan, the Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives.
  5. The Contractor shall submit for approval product data (see PART 2 – PRODUCTS) for: stainless steel well-casing and well-screens, centralizers and the products proposed for joining sections of well casing and screen (e.g., couplings or welding rods); water-supply source; artificial filter pack, transition pack; well sealant to be placed between the well casing and the borehole wall.
  6. Description of methods to be used to test for plumbness and alignment., in conformance with Paragraphs 3.06 H and J of this specification.
  7. Description of methods and quality control procedures to be used for placement of the artificial filter pack, transition pack and seals in the borehole, including depth measurements.
  8. Description of well development methods to be used, in conformance with Paragraphs 3.07 and 3.12G of this specification.
  9. Description of performance pumping-test methods, in conformance with Paragraph 3.08 of this specification.
  10. Blank Forms/Report Templates, including: Borehole Log form (for water-supply wells); Geologic Log form, Grain-size Distribution Curves, Borehole Geophysical Report form (for pilot boreholes); Final Well Design Report/Proposed Well Construction Diagram Template; Well-installation Diagram Template (As-Built Drawings), Plumbness and Alignment Test Record form; Well-development record form; Water-quality Sampling form; Pumping-test record form, Sand and Turbidity Testing form; Daily Activities Logs, Well Abandonment record form, and blank forms (paper and electronic spreadsheets) of tally sheets for drill strings, casings, tremie tubing cement, additives, filter pack materials, etc.
  11. Description of contamination prevention, and well materials and equipment decontamination procedures.
  12. Description of protective cover, surface completion procedures, including any special design criteria/features relating to frost heave prevention. The maximum frost penetration for the site shall be included in this description.
  13. Description of water management methods, including any special design criteria/features relating to managing water from well drilling activities as well as pumping tests.
  14. List of applicable publications, including GoM and local regulations and standards.
  15. List of personnel assignments for this project, and personnel qualifications.
  16. Description of well abandonment procedures.
  17. Contractor's Health and Safety procedures.
  18. Proposed source of water-supply for drilling.
  19. Descriptions, materials of construction, drawings and layouts of proposed temporary drilling platforms and temporary access tracks, in conformance with Paragraph 3.04 D of this specification.
  20. Floor plans, layouts, and other details related to temporary Field Offices, specified in SECTION 01500, TEMPORARY FACILITIES.
  21. Details, descriptions, plans and layouts to be used for erosion and sedimentation control, as specified in SECTION 01568.
- Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the

construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer

- Paragraph 3.03.A - Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.
- Paragraph 3.04.A - *Decontamination Before Mobilization*: The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
- Paragraph 3.04.B - *Staging of Well Installation and Construction Materials*: During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable substitute, so the materials will not come in contact with the ground. Materials, tools and casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.
- Paragraph 3.04.C - *Disinfection During Construction*: The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.
- Paragraph 3.04.D - *Temporary Access Tracks and Drilling Platform*: 1) The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer. 2) Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.
- Paragraph 3.04.E – *Water Resource*: Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.
- Paragraph 3.08.A – *Pumping test*.

- 1. Pumping test procedure:
  - a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.
  - b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)
  - c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease, soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.
  - d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.
  - e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria are detected, the Contractor shall re-chlorinate and analyze samples as many times as is necessary to obtain negative bacteria results, at no additional cost to Owner.
  - f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:
    - Prior to startup of test (static water level)
    - After 30 seconds

- One minute to 10 minutes: once every minute
  - Ten minutes to 100 minutes: once every 10 minutes
  - One hundred minutes to 4 hours: once every 30 minutes
  - Four hours to 12 hours: once every hour
  - Twelve hours to shut down: once every 2 hours
  - Prior to shutdown of test.
- g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.
- h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.
- i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.
- j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.
- k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.
- 2. Pumping equipment:
    - a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.
    - b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.
  - 3. Discharge pipeline and flow measurement:
    - a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.
    - b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back into the well being pumped and influence the drawdown readings of the well being tested.



- c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.
  - d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.
  - e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.
  - f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.
- 4. Pumping test records:
    - a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s) (in liters per second); the orifice head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.
    - b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.
  - **Production well construction:** Based on the approved capacities of the two proposed wellfields, a total of 30 production wells would be constructed in the Quaternary-Holocene alluvial aquifer and the Pleistocene-Holocene alluvial aquifer of the Tuul River riparian zone. Temporary changes to surface water would occur, depending on increase in surface runoff during the high intensify rainfall events, due to the direct removal of vegetation and more compaction of bare soils. However, the spatial extent of impact would be at site scale and the duration of impact would be limited to short-term. Therefore, the magnitude of impact would be low for the riparian zone of Tuul River, although the receptor sensitivity would be high due to its role in good hydrological connectivity for interaction between Tuul River surface water and groundwater in the AoI. This would result in moderate impact

significance for the riparian zone of Tuul River in the case of no best engineering practices employed. However, Contractor implementation of best engineering practices for erosion control, protection of streams, wetland, and surface water, traffic control, cleaning up project site and clearing and grubbing (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01063 and 01710; Division 2 Section 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
  - Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
  - Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
  - Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.

- Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
    3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
    4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
    5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration.

The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- **Pipeline installation:** The branch and main raw water pipelines form the two proposed wellfields to the AWPP and finished water pipeline would install in the riparian zone of Tuul River and the upland zone. During the construction phase, trenches for the installation of raw and finished water pipeline would be excavated. No impact on water resources would occur. However, indirect impact on water quality would occur due to the increase of water turbidity following the direct impacts of trenching activities on the soil. However, the duration of impact would be short-term, whereas the spatial extent of impact would be at site scale. Thus, the magnitude of impact would be moderate for the riparian zone, although the receptor sensitivity would be high. This would result in high impact significance for the riparian zone of Tuul River in case of no best engineering practices employed. Moreover, for the upland zones, the magnitude of impact would be moderate and the receptor sensitivity would be moderate because of their importance to the interaction between Tuul River surface water and groundwater in the Aol. This would result in moderate impact significance for the upland zones in the case of no best engineering practices employed. However, Contractor implementation of best engineering practices for erosion control, protection of streams, wetland, and surface water, hours of construction, and safeguarding open excavations, traffic control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01063 and 01700) and dewatering, excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling best engineering practices (as respectively defined in technical specifications, Division 2 Section 02140 and 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall

be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

- Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
- Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
- Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
    - Section 01046, Control of Work
  - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.



- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

- Section 02140, Dewatering
  - Paragraph 2.01.F – Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
  - Paragraph 2.01.G – Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
  - Paragraph 3.01.A – Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.
  - Paragraph 3.01.E - At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.
  - Paragraph 3.01.F - Do not excavate until the dewatering system is operational.
  - Paragraph 3.01.J – Dewatering Discharge:
    - 1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
    - 2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
    - 3. Provide separately controllable pumping lines.
    - 4. The Engineer reserves the right to sample discharge water at any time.
    - 5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.

- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.

- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
  - Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
  - Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
  - Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
  - Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction.
- **Tuul River Crossing:** The raw water pipelines from the Shuvuun and Biokombinat wellfields to the AWPP site would cross the Tuul River using jacking techniques at 3 and 4 locations, respectively. Therefore, Tuul River crossings has been designed to avoid or minimize the impact on flow through the River channel. The jacking activities for crossing the Tuul River would occur only at permanent streams in the riparian zone. Thus, there would no potential for increased turbidity, sediment loads and contamination downstream of the crossing. However, open cut construction techniques would be used instead of jacking construction techniques for dry streams in the riparian zone. In this case, there would be potential for increasing turbidity, sediment loads and contamination downstream of the crossing during high intensify rainfall events when there is flow in the channel. Therefore, there would be potential impacts on water quality and morphology of the streams in riparian zone depending on the timing of the construction works. However, the impact of duration would be short-term, whereas the spatial extent of impact would be a site scale. Therefore, the magnitude of impact would be moderate for the riparian zone, while the receptor sensitivity would be high due to their good hydrological connectivity role for interaction between Tuul River surface water and groundwater in the AoI. This would result in high impact significance for the riparian zone in case of best engineering practices not employed. However, Contractor implementation of best engineering practices for erosion control, protection of streams, wetland, and surface water, safeguarding open excavations, traffic control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01046, 01063 and 01700) and dewatering, excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials and backfilling best engineering practices (as respectively defined in technical specifications, Division 2 Section 02140 and 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
    - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by

- debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
- Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
  - Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
  - Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
- Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
    - Section 01046, Control of Work
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
  - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.



- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    1. Remove labels that are not permanent labels.
    2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02140, Dewatering
  - Paragraph 2.01.F – Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
  - Paragraph 2.01.G – Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
  - Paragraph 3.01.A – Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.
  - Paragraph 3.01.E - At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.
  - Paragraph 3.01.F - Do not excavate until the dewatering system is operational.
  - Paragraph 3.01.J – Dewatering Discharge:
    1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.

2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
  3. Provide separately controllable pumping lines.
  4. The Engineer reserves the right to sample discharge water at any time.
  5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
    - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
    - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
    - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
    - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
    - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
    - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
    - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
    - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
    - Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
    - Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
    - Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
    - Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
    - Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
    - Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
    - Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.

- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction.
- **Land clearance and earthworks for facilities of the BWSE project:** The facilities of the BWSE project would include buildings for AWPP, brine sewer, production well pump houses, and 10 kilovolt power distribution lines. In addition to this, temporary work camps for Contractors would be required. All these facilities and temporary worker camps would be located in both the riparian zone of the Tuul River and the upland zone. The surface runoff would increase due to the removal of vegetation cover and soil erosion as a result of land clearance and excavation works during the construction phase in the Aol. In addition

to this, the frost protection for the pipelines in the wellfields would be required insulation and 2-meter embankments. The embankment would be affected morphology which in turn to impact surface runoff direction in the wellfields. However, the embankments are designed with openings to allow the flow of water. Therefore, it is predicted that any changes in surface runoff in the riparian zone would be minor. Thus, the magnitude of impact would be low for the riparian zone, even though the receptor sensitivity would be high due to their good hydrological connectivity role for interaction between Tuul River surface water and groundwater in the Aol. This would result in moderate impact significance for the riparian zone of Tuul River without the application of the best engineering practices. Moreover, the magnitude of impact would be low for upland zones, although the receptor sensitivity would be moderate because of their importance to the interaction between Tuul River surface water and groundwater in the Aol. This would result in low impact significance for uplands in the case of no best engineering practices employed. Considering the moderate susceptibility of the riparian zone of the Tuul River to erosion, compaction and the required implementation best engineering practices by the construction contractor for the protection of streams, wetland, and surface water, erosion control, safeguarding open excavations, traffic control prior to the start of any clearing of vegetation or excavation of materials, in accordance with technical specifications (Division 1 Sections 01110, 01568, 01046 and 01063) and dewatering, excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property, backfilling and plants and planting (technical specifications, Division 2 Section 02140, 02210 and 02480), the anticipated residual impact significance would be low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
  - Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
  - Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer

- Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
    - Section 01046, Control of Work
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
  - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
  - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.



- Section 02140, Dewatering
  - Paragraph 2.01.F – Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
  - Paragraph 2.01.G – Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
  - Paragraph 3.01.A – Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.
  - Paragraph 3.01.E - At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.
  - Paragraph 3.01.F - Do not excavate until the dewatering system is operational.
  - Paragraph 3.01.J – Dewatering Discharge:
    1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
    2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
    3. Provide separately controllable pumping lines.
    4. The Engineer reserves the right to sample discharge water at any time.
    5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.

- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.

- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02480, Landscaping
  - Paragraph 2.01.A - Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.
  - Paragraph 2.01.B - Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.
    - Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.
  - Paragraph 3.03.A - Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 75 mm (3 inches) of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.
- **Contamination of water via use and storage of potential pollutants:** In particular, surface water resources could be contaminated by any accidental leakage and spills of fuel and lubricants during the installation of the raw water pipelines in the vicinity of the Tuul River. The AWPP and relevant facilities would be located in both the riparian zone of Tuul River and the upland zones at some distance from the Tuul River. Therefore, the AWPP location would reduce any risks for direct contamination of the surface water bodies. Improper storage and handling of chemicals as well as leakage and spills of fuels during maintenance of vehicles and equipment, solid and liquid wastes from the proposed temporary workers camp and construction materials on site may contaminate the surface water. Therefore, it is anticipated that the magnitude of impact would be moderate for the riparian zone, while sensitivity of the receptor would be high as it plays an important role in good hydrological connectivity for interaction between the Tuul River surface water and groundwater in the Aol. This would result in high impact significance for riparian zone in case of that the best engineering practices have been not employed. However, Contractor implementation of best engineering practices for the site-specific emergency plan, site-specific hazardous waste management plan disposal of debris, safeguarding of open excavations, protection of streams, wetland, and surface water, temporary sanitary conveniences and storage and handling hazardous materials best engineering practices (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01110, 01500 and 01610) and dewatering, well installation plan (technical specifications, Division 2 Section 02140 and 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The

Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.D – 1) Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
  - 2) The Emergency Action Plan shall include, but not be limited to the following:
    - a. Identification of hazards and risks associated with the Project.
    - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Levels of protection and selection of equipment procedures.
    - e. Field monitoring of petroleum products and potential pollutants.
    - f. Contingency and emergency procedures.
    - g. Listing of emergency contacts
  - Paragraph 1.04.E – 1) The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.
  - 2) Certain chemical and physical agents (i.e., asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulatory agencies, the Contractor shall notify the Owner immediately of the nature of the incident.
  - 3) The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
    - a. The location of potential hazards.
    - b. The potential adverse health effects posed by such hazards.
    - c. Proper safe work practices to prevent or reduce potential exposure.
    - d. Proper protective measures and equipment required.
    - e. Proper use of protective equipment.
    - f. Proper response to exposure incidents.
    - g. Proper disposal of hazardous materials.
  - 4) The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:
    - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
    - b. Hearing protection (plugs, muffs, etc.).

- c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).
- Paragraph 1.21.A – During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- Paragraph 1.21.B – Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- Paragraph 1.21.C – At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.
- Section 01046, Control of Work
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
  - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
  - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
  - Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.



- Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
- Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a Cl<sub>2</sub> residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge
- Section 01500, Temporary Facilities
  - Paragraph 3.03.A – Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
  - Paragraph 3.03.B – Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.
- Section 01610, Delivery, Storage and Handling
  - Paragraph 1.05.C – 1) The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.
    - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:  
Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
    - b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
    - c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.
    - d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
  - 2) Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.
- Section 02140, Dewatering
  - Paragraph 2.01.F – Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
  - Paragraph 2.01.G – Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
  - Paragraph 3.01.A – Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.

- Paragraph 3.01.E - At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.
- Paragraph 3.01.F - Do not excavate until the dewatering system is operational.
- Paragraph 3.01.J – Dewatering Discharge:
  1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
  2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
  3. Provide separately controllable pumping lines.
  4. The Engineer reserves the right to sample discharge water at any time.
  5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.08.A - The Contractor shall submit a Well Installation Plan within 14 days after the Notice to Proceed. The Plan shall contain a description of Contractor's overall approach for the proposed pilot and finished boreholes, and constructing water-supply wells. The Plan shall also include a detailed description of Contractor's proposed means and methods for completing the Work specified herein, including photographs and/or drawings of the proposed equipment, tools, and supplies required to drill, sample, construct, develop, test, pump and inspect the Work.
  - Paragraph 1.08.B - The Well Installation Plan shall be approved and signed by an experienced Professional Hydrogeologist with expertise in water-well design and construction, and by the Engineer.
  - Paragraph 1.08.C The following shall be incorporated into the Contractor's Well Installation Plan and followed in the field. The plan shall include, but shall not be limited to, a discussion of the following:
    1. Proposed pilot borehole drilling, including methods of borehole installation, borehole diameter, soil-sampling, grain-size analysis, borehole geophysical surveying and borehole abandonment. It shall also include samples of the proposed report forms (geologic logs, grain-size analysis, borehole geophysical surveys, etc.)
    2. Description of proposed well-drilling methods for water-supply well boreholes, including methods to overcome well drilling challenges, well-installation procedures, including temporary casings proposed, well casing and screen installation, placement of artificial filter pack, transition pack and seal materials. It is recommended that the Contractor include a detailed description, including photographs, of the drilling rig and equipment proposed to perform the Work.
    3. The Contractor shall prepare a written Drilling Fluids Plan, subject to the review of the Engineer. The Drilling Fluids Plan shall describe the proposed additives to be used in the drilling fluid (for example, soda ash, bentonite, polymer); the proportions of these additives and method of mixing; and the proposed drilling fluid properties (pH, drilling-fluid weight, fluid-loss, viscosity and calcium content). The Drilling Fluids Plan shall also explain how the drilling fluids will work in harmony with the Contractor's drilling equipment with the overall goal of stabilizing the

boreholes. The Drilling Fluids Plan shall describe the additives to be used to break down the filter cake once the well screen is installed and well development commences. Finally, the Drilling Fluids Plan shall include the name and experience record of the Drilling Fluids Engineer(s) who will monitor the drilling fluids for optimal performance throughout the drilling and well-construction process. It is recommended that the Contractor include a detailed description, including photographs, of the drilling mud mixing and circulation equipment proposed to perform the Work.

4. In the Drilling Fluids Plan, the Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives.
5. The Contractor shall submit for approval product data (see PART 2 – PRODUCTS) for: stainless steel well-casing and well-screens, centralizers and the products proposed for joining sections of well casing and screen (e.g., couplings or welding rods); water-supply source; artificial filter pack, transition pack; well sealant to be placed between the well casing and the borehole wall.
6. Description of methods to be used to test for plumbness and alignment., in conformance with Paragraphs 3.06 H and J of this specification.
7. Description of methods and quality control procedures to be used for placement of the artificial filter pack, transition pack and seals in the borehole, including depth measurements.
8. Description of well development methods to be used, in conformance with Paragraphs 3.07 and 3.12G of this specification.
9. Description of performance pumping-test methods, in conformance with Paragraph 3.08 of this specification.
10. Blank Forms/Report Templates, including: Borehole Log form (for water-supply wells); Geologic Log form, Grain-size Distribution Curves, Borehole Geophysical Report form (for pilot boreholes); Final Well Design Report/Proposed Well Construction Diagram Template; Well-installation Diagram Template (As-Built Drawings), Plumbness and Alignment Test Record form; Well-development record form; Water-quality Sampling form; Pumping-test record form, Sand and Turbidity Testing form; Daily Activities Logs, Well Abandonment record form, and blank forms (paper and electronic spreadsheets) of tally sheets for drill strings, casings, tremie tubing cement, additives, filter pack materials, etc.
11. Description of contamination prevention, and well materials and equipment decontamination procedures.
12. Description of protective cover, surface completion procedures, including any special design criteria/features relating to frost heave prevention. The maximum frost penetration for the site shall be included in this description.
13. Description of water management methods, including any special design criteria/features relating to managing water from well drilling activities as well as pumping tests.
14. List of applicable publications, including GoM and local regulations and standards.
15. List of personnel assignments for this project, and personnel qualifications.
16. Description of well abandonment procedures.
17. Contractor's Health and Safety procedures.
18. Proposed source of water-supply for drilling.

19. Descriptions, materials of construction, drawings and layouts of proposed temporary drilling platforms and temporary access tracks, in conformance with Paragraph 3.04 D of this specification.
20. Floor plans, layouts, and other details related to temporary Field Offices, specified in SECTION 01500, TEMPORARY FACILITIES.
21. Details, descriptions, plans and layouts to be used for erosion and sedimentation control, as specified in SECTION 01568.

Assessment of potential impacts on water during the construction phase is summarized in Table 7-38.

**Table 7-38 Assessment of Water Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
<b>Production well drilling</b>	Alterations to surface runoff as a result of removal of vegetation cover and soil compaction	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Detours and road accessibility, Erosion control, Protection of streams, wetland, and surface water, and Traffic control as specified in Technical specifications at Division 1 Section 01110, 01568, 01030 and 01063;  Dewatering, Well installation plan, Drilling preparation and performance pump testing as specified Technical specifications at Division 2 Section 02140 and 02672;	Low
<b>Well construction</b>		The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Protection of streams, wetland, and surface water, Traffic control, and Cleaning up project site as specified in Technical specifications at Division 1 Section 01110, 01568, 01063 and 01710;  Clearing and grubbing as specified in Technical specifications at Division 2 Section 02230;	Low
<b>Pipeline installation</b>	Effects on dry stream bed at pipeline crossing point	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Erosion control, Protection of streams, wetland, and surface water, , Hours of construction, Safeguarding open excavations, Traffic control and final cleaning as specified in Technical specifications at Division 1 Section 01110, 01568, 01046, 01063 and 01700;	Low
		Upland	Moderate			Moderate	Moderate		Low



Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								Dewatering, Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, care and Restoration of property and Backfilling as specified in Technical specifications at Division 2 Section 02140 and 02210;	
<b>Tuul River crossing</b>	Potential for increasing turbidity, sediment loads and contamination in the downstream	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Erosion control, Protection of streams, wetland, and surface water, Safeguarding open excavations, Traffic control and final cleaning best as specified in Technical specifications at Division 1 Section 01110, 01568, 01046, 01063 and 01700;  Dewatering, Excavation, Separation of excavated material for reuse, Reuse and disposal of surplus excavated materials and Backfilling as specified in Technical specifications at Division 2 Section 02140 and 02210;	Low
<b>Construction of AWPP facilities</b>	Suspended solids in surface runoff resulting in deterioration of water quality	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency:	Moderate	Moderate	Safeguarding of open excavations and Erosion control, Protection of streams, wetland, and surface water and final cleaning as specified in Technical specifications at Division 1 Section 01046, 01110, 01568 and 01700;	Low
		Upland	Moderate			Moderate	Moderate		Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
					Occasionally			Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Erosion control barrier, Planting, and planting and Maintenance of trees, shrubs and ground cover as specified in Technical specifications at Division 2 Section 02210, 02268, 02480 and 02483;	
<b>Temporary works camp</b>	Alterations to surface runoff as a results removal of vegetation cover	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Protection of streams, wetland, and surface water, Field office, Visitor center, Temporary perimeter fence, Temporary electrical, Temporary heat, Temporary sanitary conveniences, Site security, and Shelter and protection of materials, and Cleaning up project site as specified in Technical specifications at Division 1 Section, 01110, 01568 and 01500 and 01700;	Low
		Upland	Moderate			Low	Low		Low
<b>Land clearance and earthworks</b>	Alterations to surface water flow resulting in changes to the vegetation cover and soil erosion	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Safeguarding of open excavations, Traffic control, Erosion control and Protection of streams, wetland, and surface water as specified in Technical specifications at Division 1 Section 01046, 01063 01110, and 01568;	Low
		Upland	Moderate			Moderate	Moderate	Dewatering, Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								Restoration of property, Backfilling and Plants and Planting as specified in Technical specifications at Division 2 Section 02140, 02210 and 02480;	
<b>Contamination of water</b>	Leaks and spills causing contaminated runoff or infiltration and transport through groundwater resulting in deterioration of water quality	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Site-specific emergency plan, Site-specific hazardous waste management plan Disposal of debris, Safeguarding of open excavations, Protection of streams, wetland, and surface water, and Temporary sanitary conveniences and Storage and handling hazardous materials as specified in Technical specifications at Division 1 Section 01030, 01046, 01110 and 01500 and 01610;	Low
		Upland	Moderate			Moderate	Moderate	Dewatering, Well installation plan as specified in Technical specifications at Division 2 Section 02140 and 02672;	Low

## 7.6.6 Operation and Maintenance Impacts

- **Groundwater abstraction from wellfield:** Groundwater abstraction from production wells in Biokombinat and Shuvuun wellfields would not lead to further direct potential impacts on the riparian zone of the Tuul River. Therefore, the magnitude of impact would be negligible for it, although the receptor sensitivity would be high as they play important roles in good hydrological connectivity for interaction between the Tuul River surface water and groundwater in the Aol. This would result in low impact significance for the riparian zone in case of that the best engineering practices have been not employed. Furthermore, Operator implementation of best engineering practices and management measures consistent with those implemented during construction, as well as compliance with *Special and Ordinary Protection and Sanitary Zones of Water Sources*, approved by joint decree A-230/127 of 2015, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Maintenance of pipeline:** No direct potential impact to water would be expected. Therefore, the magnitude of impact would be low for the riparian zone of Tuul River, although the receptor sensitivity would be high as they play important roles in good hydrological connectivity for interaction between the Tuul River surface water and groundwater in the Aol. This would result in moderate impact significance for riparian zone without the best engineering practices employed. Moreover, the magnitude of impact would be low for the upland zones, although the receptor sensitivity would be moderate because of their importance to the interaction between Tuul River surface water and groundwater in the Aol. This would result in low/negligible impact significance for the upland zones in case of no best engineering practices employed. Furthermore, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with MNS 5918:2008, MNS 5914 : 2008 and MNS 5916 : 2008, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low/negligible.
- **Access road:** Access road to two wellfields, AWPP and ovoo would be constructed or enhanced during the construction phase. However, access roads could be contaminated via vehicle movements, potential spills, leakages and accidents. However, this would be temporary and at site scale. Therefore, the magnitude of impact would be low for the riparian zone of the Tuul River, although the receptor sensitivity would be high as they play important roles in good hydrological connectivity for interaction between the Tuul River surface water and groundwater in the Aol. This would result in low impact significance for the riparian zone without the best engineering practices employed. Moreover, the magnitude of impact would be low for upland zones, although the receptor sensitivity would be moderate because of their importance to the interaction between Tuul River surface water and groundwater in the Aol. This would result in low/negligible impact significance for the upland zones in case of no best engineering practices employed. Furthermore, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low/negligible.
- **Solid and liquid disposal:** The residual handling facilities for the AWPP activities would be constructed under the design control during the construction phase. Final brine flow from the AWPP operation would be disposed using brine disposal sewer to the new planned CWWTP effluent channel, which discharges to the Tuul River. AECOM has evaluated and confirmed that the brine discharged would comply with MNS 4943:2015 for discharge to surface water bodies, presented in Table A-5 in Appendix A. Therefore, no direct impact on water quality would be expected. Thus, the magnitude of impact would be low for the riparian zone of Tuul River, although the receptor sensitivity would be high as it plays an important role in good hydrological connectivity for interaction between the Tuul River surface water and groundwater in the Aol. This would result in moderate impact

significance for riparian zone without the best engineering practices employed. However, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with MNS 4943:2015 and MNS 6458:2014, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.

Assessment of potential impacts on water quality during the operation and maintenance phase is summarized in Table 7-39.



**Table 7-39 Assessment of Water Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Groundwater abstraction from Wellfield</b>	No impacts direct	The riparian zone of the Tuul River	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development;	Negligible
<b>Maintenance of pipeline</b>	Changes to natural drainage	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.;	Low
		Upland	Moderate			Low	Low	MNS 5918:2008-The General Technical Requirements for Vegetation of Eroded Land; MNS 5914 : 2008- Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions; MNS 5916 : 2008- Topsoil stripping and storage during earthworks;	Negligible
<b>Access road</b>	Leaks and spills leading contamination	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Local Duration: Temporary Frequency: Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.;	Low
		Upland	Moderate			Low	Low		Negligible

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
<b>Solid and liquid disposal:</b>	No impacts direct	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Local Duration: Long-term Frequency: Regularly	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.; MNS 4943:2015- Effluent Wastewater Quality Standard MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals	Low

The potential impacts from the BWSE project activities to Tuul river surface water resource and its quality have been identified and summarized in Table 7-37, Table 7-38 and Table 7-39.

As shown in Table 7-37, Table 7-38 and Table 7-39, the potential impact to Tuul river surface water resource and its quality in the Aol are likely to arise primarily during the construction activities of the raw and finished water pipelines, wellfields, AWPP facilities, and temporary facilities such as worker camps, through direct vegetation removal and soil disturbance associated with land clearance and earthworks during the construction phase.

The significance of the residual impacts on Tuul river surface water resource and its quality would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

## 7.7 Ecosystem Services and Ecology

The risks and impacts identification process should consider direct and indirect project-related impacts on biodiversity and ecosystem services and identify any significant residual impacts (IFC, 2012). This process will consider relevant threats to biodiversity and ecosystem services, especially focusing on habitat loss, degradation, and fragmentation. In other words, ecosystem services valued by humans are often underpinned by biodiversity (IFC, 2012). Furthermore, the project-related impacts on biodiversity would often adversely affect the delivery of ecosystem services.

The Aol of the BWSE project would be classified as modified habitat area<sup>59</sup>, since ecosystem components in the Aol have been substantially altered by human activities as discussed in Section 6.1.

Furthermore, the habitat condition or type of biodiversity features in the BWSE project's Aol has been lost or degraded and fragmented because of environmental pollution (e.g., Tuul River surface water pollution due to CWWTP outfall discharges) and human-induced activities (e.g., gravel mining activities in the Shuvuun area, overgrazing, and the expansion of urbanization or settlements area).

On the other hand, recognizing that the proposed BWSE project component locations or routes are mainly located or pass through urban zones and inhabited areas, and along roads, where modified types of ecosystem components are already dominant, it is not likely to have significant negative impacts on biodiversity features from this project activity.

This Section assesses potential impacts on biodiversity features of terrestrial ecology (i.e. flora and fauna) arising from the BWSE project activities during the pre-construction, construction, and operation and maintenance phases.

### 7.7.1 Biodiversity Features Receptor Sensitivity

The sensitivity of vegetation cover to any impacts depends on several factors such as the local climatic regime, soil erosion, fertility, and human activities (e.g. urbanization, overgrazing). The sensitivity of fauna is dependent on the population, birth rate, and their conservation status. The receptor sensitivity of biodiversity features is determined based on the ecological structure or functions needed to maintain local ecosystem services, and their conservation status

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<sup>59</sup> Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition (IFC PS6, 2012)

according to IUCN and the Mongolian Red Book (MEGD, 2013). The classification of biodiversity features are shown in Table 7-40.

**Table 7-40 Biodiversity Feature Receptor Sensitivity**

Receptor Sensitivity	Description
<b>Negligible</b>	Biodiversity features not included in the threatened species lists or not designated as rare/very rare by Mongolian regulations
<b>Low</b>	Biodiversity features listed as least concern (LC) on the IUCN and Regional Red List of threatened species.
<b>Moderate</b>	Biodiversity features listed as Vulnerable (VU) on the IUCN and Regional Red List of threatened species.
<b>High</b>	Biodiversity features listed as Critically Endangered (CR) or Endangered (EN) on the IUCN and Regional Red List of threatened species.

As discussed in Section 6.1.12, a total of 118 plant species (i.e. annual plants, perennial plants, shrubs, and trees) in the Aol have been recorded within the ecological survey. Seen from the ecological survey of the distribution of vegetation cover and their types of growth in the Aol, 91.52 percentage of the plants are annual and perennial, and the rest of the plants are of other types, including shrubs and trees plants.

As mentioned in Section 6.1.11, the Tuul River provides supporting ecosystem services, such as nutrient and water cycles, which are essential for the functioning of natural processes. In other words, the riparian zone of the Tuul River, as a network distributed over a large area, is a key landscape component in maintaining biological connections along extended and dynamic environmental gradients.

Thus, plant species in riparian zone are often indigenous to the near-stream zone and are frequently considered rare and/or critical to the ecosystem. For example, the *Salix* communities in the riparian zone of Tuul River in the Aol could be noted.

Therefore, *Salix* communities would have a high receptor sensitivity due to their important role in regulating and supporting ecosystem services in the Aol. As mentioned above, annual and perennial plant species are dominant in the Aol. These plant communities would have moderate receptor sensitivity due to their important role in provisioning and supporting ecosystem services.

As described in Section 6.1.13, Mongolian marmot (*Marmota sibirica*), Daurian pika (*Ochotona dauurica*) and Long-tailed ground squirrel (*Spermophilus undulatus*) have been recorded during the fauna field survey.

The Mongolian marmot (*Marmota sibirica*) is classified as Endangered in both the IUCN and the regional red lists, whereas Daurian pika (*Ochotona dauurica*) and Long-tailed ground squirrel (*Spermophilus undulatus*) are classified as Least Concern in both the IUCN and regional red list assessments.

Therefore, Mongolian marmot (*Marmota sibirica*) would have high receptor sensitivity due to their conservation status. In addition to this, Daurian pika (*Ochotona dauurica*) and Long-tailed ground squirrel (*Spermophilus undulatus*) would have low receptor sensitivity due to their conservation status.

Furthermore, the birds recorded during the field survey include Magpie (*Pica pica*), Rook (*Corvus frugilegus*), Red-billed chough (*Pyrrhocorax*), Black kite (*Milvus migrans*), Common kestrel (*Falco tinnunculus*), and Demoiselle crane (*Grus virgo*). All of the birds are listed in the Least Concern category both regionally and globally according to IUCN Red List of Threatened Species. Thus, all birds in the Aol would have low receptor sensitivity due to their conservation status.

## 7.7.2 Biodiversity Features Impact Magnitude

The habitat type and the biological characteristics of a particular plant can be the main indicators to assess the magnitude of the potential impacts. The following are possible pathways for the potential impacts of the BWSE project activities on biodiversity features.

- Direct and indirect loss or disturbance of habitat area (e.g. land clearance, earthworks and vehicle movements)
- Direct or indirect contamination of habitat area (e.g. spillage of contaminations)

The classification of the magnitude of impacts of biodiversity features are described in Table 7-41.

**Table 7-41 Ranking of Magnitude of Biodiversity Feature**

Ranking of magnitude	Description
<b>Negligible</b>	Changes to the biodiversity features are indistinguishable to the natural background variation or habitat degradation that is expected to recover to the baseline condition with an expected recovery period of less than 1 year after rehabilitation is completed.
<b>Low</b>	Impacts on biodiversity features that cause a reversible loss of species at site level or habitat degradation that is expected to recover to the baseline condition with an expected recovery period of 1-2 years following completion of rehabilitation. The duration of impact would be temporary. The size of the affected vegetation cover would be less than 1 hectare.
<b>Moderate</b>	Impacts on biodiversity features that cause a reversible loss of species at the regional level or habitat degradation that is expected to recover to the baseline condition within 3 - 10 years of rehabilitation. Impact duration would be short-term (limited to construction phase). The size of the affected vegetation cover would be between 1-10 hectares
<b>High</b>	Impacts on biodiversity features that cause irreversible loss of species at regional level or habitat degradation that is not expected to recover to baseline within 10 years of rehabilitation. Impact duration would be medium-term and long-term (more than 5 years). The size of the affected vegetation cover would be more than 10 hectares.

## 7.7.3 Assessment of Potential Impacts on Biodiversity features

The magnitude of impacts has been assessed against the impact magnitude criteria presented in Table 7-41. This has been combined with the receptor sensitivity assessment using the matrix approach discussed in Section 3. Potential impacts to biodiversity features in the AoI are likely to arise primarily during the construction phase of the raw and finished water pipelines, wellfields and AWPP facilities, through direct vegetation removal or disturbance associated with land clearance and earthworks during the construction phase (see Table 7-42).

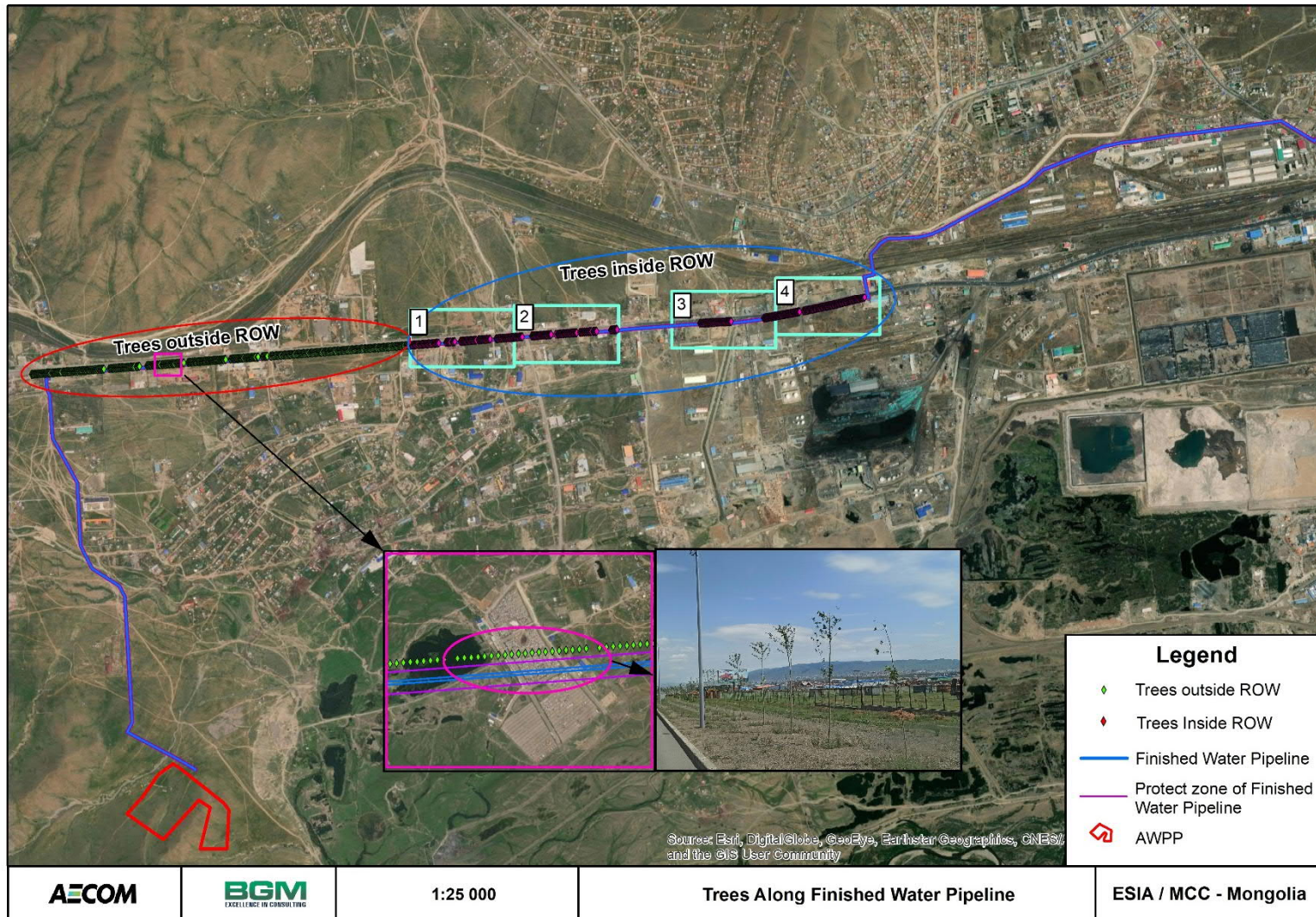
It is important to note that 879 planted trees would be impacted due to finished water pipeline installation during the construction phase (see Figure 7-12 and Figure 7-13).

Figure 7-13 shows that 397 of these trees are located within the protection zone of the finished water pipeline.



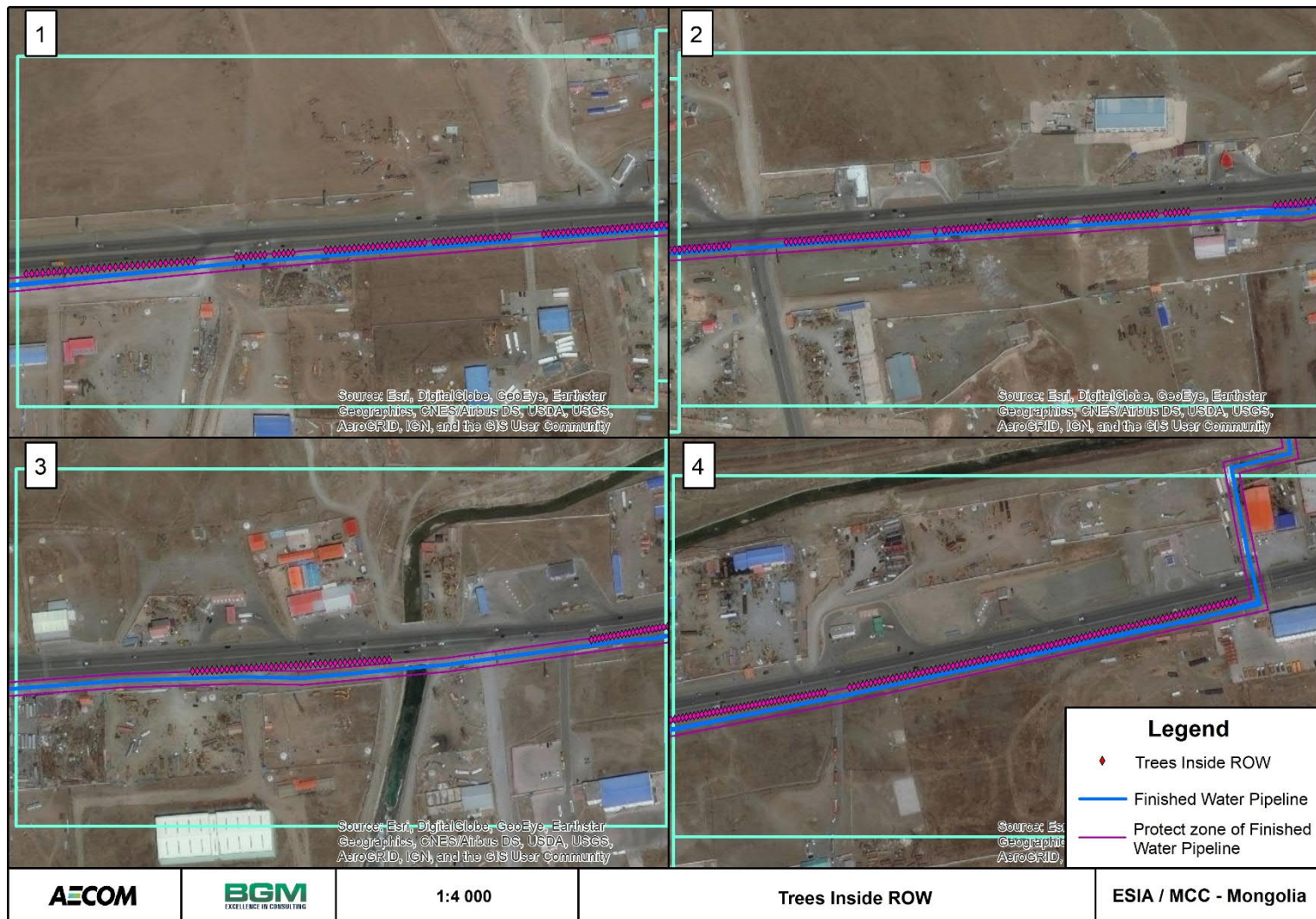
**Table 7-42 Direct Vegetation Disturbance due to Project Activities**

Project components	Stipa-Forb, Festuca-Forb, Sedge Community (hectare)	Festuca-Forb- Sedge, Grass- Forb Community (hectare)	Stipa-Forb, Small Tillers- Grass Community (hectare)	Grass-Forb, Elytrigia repens-Forb Community (hectare)	Stipa- Elytrigia Repens, Grass-Forb Community (hectare)	Salix Community (hectare)	Grass-Sedge- Forb, Sedge- Forb Community (hectare)
Raw water transmission pipeline from the Biokombinat wellfield to the proposed AWPP	-	0.97	-	-	-	0.78	-
Raw water transmission pipeline from the Shuvuun wellfield to the proposed AWPP	6.11	1.18	0.08	-	4.50	1.78	0.55
Raw water transmission branch pipelines in Biokombinat source	0.45	-	-	-	0.33	3.29	-
Raw water transmission branch pipelines in the Shuvuun source	-	-	-	-	-	4.99	-
Finished water transmission pipelines from the AWPP to the USUG water distribution network	5.73	0.01	-	-	2.05	-	-
Access road to AWPP	1.39	0.11	-	-	0.53	-	-
Access road to Biokombinat wellfield	0.31	-	-	-	0.34	-	-
Access road to Shuvuun wellfield	-	-	-	-	0.88	2.54	-
Access road within Biokombinat and Shuvuun wellfields	0.23	-	-	-	0.31	2.56	-
Access road to Ovoo	-	-	-	-	-	-	-
AWPP facilities	0.49	4.82	-	-	-	-	-
Brine sewerage pipeline	0.28	0.46	-	-	-	0.15	-
10 kV electricity transmission lines	-	-	-	-	-	4.70	-
10 kV electricity transmission lines	0.6	1.5	-	-	0.2	3.2	0.0
<b>Total</b>	<b>15.6</b>	<b>9.1</b>	<b>0.08</b>	<b>-</b>	<b>9.2</b>	<b>24</b>	<b>0.55</b>



**Figure 7-12 Planted Trees along Finished Water Pipeline**





**Figure 7-13 Planted Trees along Finished Water Pipeline in the ROW**

## 7.7.4 Pre-construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site

- **Exploratory and test well drilling and geophysical survey:** These activities occurred in annual and perennial plant species at the proposed wellfields. Vegetation disturbance or removal has led to a temporary change in biotic conditions that may cause a change in the local ecosystem services. These activities also occurred in habitat areas of birds and mammals. No direct habitat loss was expected from these activities. The spatial extent of the impact of these activities would be determined as site scale. Therefore, the magnitude of impact would be low for these plant communities, although the receptor sensitivity is moderate due to their important role in provisioning and supporting ecosystem services. This would result in low impact significance for these plant species, if best engineering practices were not employed. The magnitude of impact would be low for birds and mammals, and the receptor sensitivity is low due to their conservation status. This would result in low impact significance for birds and mammals, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, and task hazard assessments and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Geotechnical, Topography and Geodesy survey:** These field investigations occurred along raw and finished water pipelines, at the two proposed wellfields and the AWPP site, where annual and perennial plant species were dominantly distributed in the Aol. Additionally, low impact is expected on flora and any fauna since these areas are devoid of significant unique floral and faunal life, except for Mongolian marmot (*Marmota sibirica*). In addition to this, vegetation disturbance is expected to be low due to vehicle movement and borings. Therefore, the magnitude of impact would be low for these plant communities, although the receptor sensitivity is moderate due to their important role in provisioning and supporting ecosystem services. This would result in low impact significance for these plant species, were best engineering practices not employed. The magnitude of impact would be low for Mongolian marmot (*Marmota sibirica*), although the receptor sensitivity is high due to their conservation status. This would result in moderate impact significance for Mongolian marmot (*Marmota sibirica*), if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, and regulation on operational safety during engineering-geological and geotechnical works of construction, including General Requirements: CR 12-102-04 and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible/low.

Assessment of potential impacts on biodiversity features for the pre-construction phase is summarized in Table 7-43.

**Table 7-43 Assessment of Biodiversity Features Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
Exploratory and Test well drilling	Vegetation cover disturbance and removal.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	Health and safety management plan; Site safety plan; Emergency preparedness plan; Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;	Negligible
		Birds* and mammals**	Low			Low	Low		Negligible
Geophysical survey		Annual and perennial plant species	Moderate			Low	Low		Negligible
		Birds* and mammals**	Low			Low	Low		Negligible
Geophysical survey		Annual and perennial plant species	Moderate			Low	Low		Negligible
		Birds*, Mammals** Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	Low/ Moderate		Negligible/Low
Geotechnical field survey		Annual and perennial plant species	Moderate			Low	Low		Negligible
		Birds*, Mammals** and Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	Low/ Moderate		Negligible/Low
Topography and geodesy field survey		Annual and perennial plant species	Moderate			Low	low		Negligible
		Birds* , Mammals** and Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	low		Negligible/Low
*Magpie ( <i>Pica pica</i> ), Rook ( <i>Corvus frugilegus</i> ), Red-billed chough ( <i>Pyrrhocorax</i> ), Black kite ( <i>Milvus migrans</i> ), Common kestrel ( <i>Falco tinnunculus</i> ), and Demoiselle crane ( <i>Grus virgo</i> ). ** Daurian pika ( <i>Ochotona dauurica</i> ) and Long-tailed ground squirrel ( <i>Spermophilus undulatus</i> )									



## 7.7.5 Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site:

- **Production well drilling:** The production well drilling activities would occur in annual and perennial plant species at the proposed wellfields. Vegetation disturbance or removal would occur due to the drilling vehicles and worker movement on the ground. This may have negative and direct impacts on vegetation cover. Habitat loss, degradation, and fragmentation for birds and mammals would not occur during the drilling works since this activity would not be employed in critical habitat areas of fauna. Also, this activity would occur temporarily. The spatial extent of the impact would be determined as site scale. Therefore, the magnitude of impact would be low for these plant communities, although the receptor sensitivity is moderate due to their important role in provisioning and supporting ecosystem services. This would result in low impact significance for these plant species, without the best engineering practices employed. The magnitude of impact would be low for birds and mammals, and the receptor sensitivity is low due to their conservation status. This would result in low impact significance for birds and mammals, without best engineering practices being employed. However, Contractor implementation of best engineering practices for detours and road accessibility, erosion control, protection of land resources, traffic control, areas and drilling preparation and performance pump testing (as respectively defined in technical specifications, Division 1 Section 01030, 01110, 01568, and 01063; Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
- Section 01030, Special Requirements
  - Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
  - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
  - Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

- Paragraph 3.04.A – Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas approved in the Construction Permit.
- Paragraph 3.04.B – Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- Paragraph 3.04.C – Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- Paragraph 3.04.D – Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.
- Paragraph 3.04.E - All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25 mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
- Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- Paragraph 3.04.G - The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands. Where the Works will be in floodplains, the Contractor shall take into consideration the rainy season period and take such measures as necessary to provide safe access to storage and temporary facilities. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- Paragraph 3.04.H - Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.

- Paragraph 3.04.I - All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer
  - Paragraph 3.03.A - Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.
  - Paragraph 3.04.A - *Decontamination Before Mobilization*: The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
  - Paragraph 3.04.B - *Staging of Well Installation and Construction Materials*: During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable substitute, so the materials will not come in contact with the ground. Materials, tools and

casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.

- Paragraph 3.04.C - Disinfection During Construction: The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.
- Paragraph 3.04.D - *Temporary Access Tracks and Drilling Platform*: 1) The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer. 2) Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.
- Paragraph 3.04.E – Water Resource: Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.
- Paragraph 3.08.A – *Pumping test*:
  - 1. Pumping test procedure:
    - a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.
    - b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)

c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease, soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.

d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.

e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria are detected, the Contractor shall re-chlorinate and analyze samples as many times as is necessary to obtain negative bacteria results, at no additional cost to Owner.

f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:

- Prior to startup of test (static water level)
- After 30 seconds
- One minute to 10 minutes: once every minute
- Ten minutes to 100 minutes: once every 10 minutes
- One hundred minutes to 4 hours: once every 30 minutes
- Four hours to 12 hours: once every hour
- Twelve hours to shut down: once every 2 hours
- Prior to shutdown of test.

g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.

h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.

i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.



- j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.
- k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.
- o 2. Pumping equipment:
  - a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.
  - b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.
- o 3. Discharge pipeline and flow measurement:
  - a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.
  - b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back into the well being pumped and influence the drawdown readings of the well being tested.
  - c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.
  - d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.
  - e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead

free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.

f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.

o 4. Pumping test records:

a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s) (in liters per second); the orifice head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.

b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.

- o **Pipeline installation and Tuul River crossing:** The branch and main raw water pipelines from the two proposed wellfields to the AWPP and finished water pipeline from AWPP to the connection point of UGUS would be installed in areas where communities of annual and perennial plant species and *Salix* are distributed. Raw water pipelines from proposed Shuvuun and Biokombinat wellfields to AWPP site would cross the main channels of the Tuul River using jacking techniques. The jacking activities for crossing Tuul River would occur at areas where communities of annual and perennial plant species and *Salix* are distributed. These vegetation communities would be degraded and removed along the construction corridor of pipeline installation due to excavation and jacking activities during the construction phase. Furthermore, *Salix* communities provide suitable habitat areas for resident birds, whereas annual and perennial plant species allow resources (e.g., food) for mammals. Given design control (i.e., jacking techniques), there is no impact expected for aquatic invertebrate species. As mentioned in Section 7.7.3, there are 397 planted trees located within the protection zone of the finished water pipeline. These trees would be directly impacted due to earth and construction work of the finished water pipeline. The duration of impact for pipeline installation would be short-term, whereas the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for the annual and perennial plant species, and the receptor sensitivity would be moderate due to their important role in provisioning and supporting ecosystem services. This would result in moderate impact significance for these vegetation communities without the application of best engineering practices. In addition to this, the magnitude of impact would be moderate for the *Salix* communities, while the receptor sensitivity would be high due to their important role in regulating and supporting ecosystem services. This would result in high impact significance for the *Salix* communities and the planted trees in case of no best engineering practices employed. The magnitude of impact would be low for birds and mammals, although the receptor sensitivity is low due to their conservation status. This would result in low

impact significance for birds and mammals, without best engineering practices employed. However, Contractor implementation of best engineering practices for erosion control, protection of land resources, hours of construction, and safeguarding open excavations, traffic control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01046, 01063, and 01700) and plants, loam and seed, planting, maintenance of seeded areas and planting, loaming and seeding of disturbed area, excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02480, 02485 and 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
  - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
  - Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.04.A – Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas approved in the Construction Permit.
  - Paragraph 3.04.B – Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

- Paragraph 3.04.C – Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- Paragraph 3.04.D – Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.
- Paragraph 3.04.E - All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25 mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
- Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- Paragraph 3.04.G - The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands. Where the Works will be in floodplains, the Contractor shall take into consideration the rainy season period and take such measures as necessary to provide safe access to storage and temporary facilities. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- Paragraph 3.04.H - Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.
- Paragraph 3.04.I - All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.

- Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
  - Section 01046, Control of Work
    - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
    - Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
    - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
    - Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
    - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
  - Section 01063, Miscellaneous Requirements
    - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
    - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
    - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
  - Section 01700, Contract Closeout



- Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
  1. Remove labels that are not permanent labels.
  2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
  3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
  4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02480, Landscaping
  - Paragraph 2.01.A - Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.
  - Paragraph 2.01.B - Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.
    - Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.
  - Paragraph 2.10.A - Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in equal proportions. Free of stumps, roots, heavy or stiff clay, stones larger than 2.5 cm in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.
  - Paragraph 2.10.B - Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.
  - Paragraph 3.03.A - Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 75 mm (3 inches) of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.
  - Paragraph 3.08.C - Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 2 kg per 90 m<sup>2</sup> on calm day, by mechanical means. Do not "Hydro-Seed" unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 6 mm and compact by means of an acceptable lawn roller weighing 45 to 70 kg per linear 0.3 m of width.
  - Paragraph 3.08.E - Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 80 pounds per acre. Rake seed lightly, after sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 45 to 70 kg per linear 0.3 m of width.
  - Paragraph 3.10.A - Maintain lawn areas and other seed areas at maximum height of 6.5 cm by mowing at least three times. Weed thoroughly once and

maintain until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

- Paragraph 3.10.B - Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
- Paragraph 3.10.C - Reset settled plants to proper grade and position and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period.

- Section 02485, Loaming and Seeding

- Paragraph 2.01.A – Testing:
  1. All loam used in the work of this section of the specifications will be tested and approved for use by the Engineer prior to being spread. Stripped material may be used if approved in accordance with the following requirements. Approved material shall be stockpiled so as not to interfere with the other work and other subgrade or fill materials.
  2. All testing shall be done by an independent test laboratory approved by the Engineer. The Contractor shall provide the laboratory with representative soil samples for testing and send test reports directly to the Engineer.
  3. Loam shall be tested for the following: pH, organics, buffer pH, soluble salts (expressed in millimhos), available Nitrogen, Phosphorous, exchangeable Potassium, Magnesium, Calcium and Sodium, Cation Exchange Capacity, percent H base saturation, percent Ca base saturation, percent M base saturation, and available Zinc, Manganese, Copper, Iron, humus content and soil type. All nutrient results shall be expressed in parts per million (ppm).
  4. Test reports shall also contain specific recommendations as to the exact types and times and rates of application of soil additives and fertilizers based upon the soil test results. These recommendations shall be followed during lawn construction. All Contractors shall note that any and all materials and procedures, with respect to soil additives and fertilizers, contained herein are approximate and are given to assist bidding and that they will be adjusted to comply with test reports.
- Paragraph 2.01.B – Loam shall be a "fine sandy loam", or a "sandy loam" determined by mechanical analysis. It shall be of uniform composition, without mixture of subsoil. It shall be free of stones, lumps, plants and their roots, debris and other extraneous matter over 13 mm (0.5 in) in diameter or excess quantities of smaller pieces of the same materials as determined by the Engineer. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well drained areas which have never been stripped before.
- Paragraph 2.01.C - No more than 10 percent of loam shall be clay, with organic matter comprising not less than 4 percent, nor more than 20 percent of the total weight per load
- Paragraph 2.01.D – Loam shall not be delivered or worked in a frozen or muddy condition.
- Paragraph 2.01.E- Soluble salts shall not be higher than 75 parts per million.
- Paragraph 2.04.A – Grass seed shall be fresh, clean new crop seed. It may be mixed by an approved method on the site or may be mixed by the dealer. If mixed on the site, each variety shall be delivered in the original containers

which shall bear the dealer's analysis. If the seed is mixed by the dealer, the Contractor shall furnish to the Engineer, the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety. Seed shall be adapted to the Mongolian climate and tested here.

- Paragraph 2.04.B - The seed shall be furnished and delivered premixed in the proportions specified below. All seed shall comply with MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area, seed laws.
- Paragraph 2.04.C – Grass seed shall be the previous year's crop and in no case shall the weed seed content exceed 1 percent by weight.
- Paragraph 2.04.D – The seed mixture specified for slopes are for use on slopes graded at the rate of 4:1 and steeper slopes.
- Paragraph 2.04.E - A manufacturer's certificate of compliance to the specifications shall be submitted to the Engineer by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and sown until the contractor has submitted the certificates to the Engineer.
- Paragraph 2.04.F – Seed Mixture shall conform with standard locally available mix and shall be used for all loamed areas 17 g/m<sup>2</sup> (150 lb/acre). Seed mixture shall be in accordance with the following:
  - Seed contains mixture of 3 seeds of 2 species of Festuca and sedge (Cyperus).
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
  - Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
  - Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
  - Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so

that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.

- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.

- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
  - Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction.
- **Land clearance, earthworks and construction of BWSE project facilities:** The facilities of the BWSE project would include buildings for the AWPP, brine sewer, production well pump houses, and 10 kilovolt power distribution lines. In addition to this, temporary work camps for Contractors would be required. All these facilities and temporary worker camps would be located in areas where communities of annual and perennial plant species and *Salix* are distributed. The bulk land clearance and earthworks, such as topsoil stripping, grading and trenching excavation would cause direct vegetation disturbance and removal. The vegetation cover would expose bare soils to erosion and compaction due to movement of heavy trucks, excavators and vehicles. The removal of topsoil and long-term stockpiling would also decrease the viability and longevity of the soil seed stores of vegetation communities, especially for annual and perennial plant species in the Aol. Thus, it would cause habitat loss, degradation and fragmentation of mammal habitat areas. It is anticipated that noise and vibration emissions arising from earthworks and construction activities would result in the displacement of fauna from habitats near the BWSE project footprint, and the associated facilities. However, some species may be able to habituate to consistent noise and vibration levels during construction while other species are unlikely to adjust. The disturbance caused by noise and vibration during construction to priority mammals and birds is expected to be of moderate magnitude of impact. Additionally, impacts on flora and fauna during the earthworks and construction activities would occur as site scale. The duration of the impacts would be short-term.
  - Therefore, the magnitude of impact would be moderate for the annual and perennial plant species, while the receptor sensitivity would be moderate due to their important role in provisioning and supporting ecosystem services. This would result in moderate impact significance for these vegetation communities without the application of best engineering practices.
  - The magnitude of impact would be moderate for the *Salix* communities, while the receptor sensitivity would be high due to their important role in regulating and supporting ecosystem services. This would result in high impact significance for the *Salix* communities in case of no best engineering practices employed.
  - The magnitude of impact would be moderate for birds and mammals, although the receptor sensitivity is low due to their conservation status. This would result in moderate impact significance for birds and mammals, without best engineering practices employed.
  - The magnitude of impact would be high for Mongolian marmot (*Marmota sibirica*), and the receptor sensitivity is high due to their conservation status. This would result in high impact significance for Mongolian marmot (*Marmota sibirica*), without the application best engineering practices.

However, Contractor implementation of best engineering practices for erosion control, protection of land resources, hours of construction, and safeguarding open excavations, traffic control and final cleaning (as respectively defined in technical specifications, Division 1 Section 01110, 01568, 01046, 01063, and 01700) and plants, loam and seed, planting, maintenance of seeded areas and planting, loaming and seeding of disturbed area, excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02480, 02485 and 02210) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low and moderate. The Contractor



would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
  - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
  - Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.04.A – Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas approved in the Construction Permit.
  - Paragraph 3.04.B – Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
  - Paragraph 3.04.C – Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
  - Paragraph 3.04.D – Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.

- Paragraph 3.04.E - All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25 mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
- Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- Paragraph 3.04.G - The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands. Where the Works will be in floodplains, the Contractor shall take into consideration the rainy season period and take such measures as necessary to provide safe access to storage and temporary facilities. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- Paragraph 3.04.H - Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.
- Paragraph 3.04.I - All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
    - Section 01046, Control of Work
  - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to

increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01700, Contract Closeout
  - Paragraph 1.04.A - Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    5. Remove labels that are not permanent labels.
    6. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
    7. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

8. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- Section 02480, Landscaping
    - Paragraph 2.01.A - Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.
    - Paragraph 2.01.B - Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.
      - Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.
    - Paragraph 2.10.A - Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in equal proportions. Free of stumps, roots, heavy or stiff clay, stones larger than 2.5 cm in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.
    - Paragraph 2.10.B - Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.
    - Paragraph 3.03.A - Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 75mm (3 inches) of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.
    - Paragraph 3.08.C - Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 2 kg per 90 m<sup>2</sup> on calm day, by mechanical means. Do not "Hydro-Seed" unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 6 mm and compact by means of an acceptable lawn roller weighing 45 to 70 kg per linear 0.3 m of width.
    - Paragraph 3.08.E - Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 80 pounds per acre. Rake seed lightly, after sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 45 to 70 kg per linear 0.3 m of width.
    - Paragraph 3.10.A - Maintain lawn areas and other seed areas at maximum height of 6.5 cm by mowing at least three times. Weed thoroughly once and maintain until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.
    - Paragraph 3.10.B - Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
    - Paragraph 3.10.C - Reset settled plants to proper grade and position and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period.

- Section 02485, Loaming and Seeding
  - Paragraph 2.01.A – Testing:
    1. All loam used in the work of this section of the specifications will be tested and approved for use by the Engineer prior to being spread. Stripped material may be used if approved in accordance with the following requirements. Approved material shall be stockpiled so as not to interfere with the other work and other subgrade or fill materials.
    2. All testing shall be done by an independent test laboratory approved by the Engineer. The Contractor shall provide the laboratory with representative soil samples for testing and send test reports directly to the Engineer.
    3. Loam shall be tested for the following: pH, organics, buffer pH, soluble salts (expressed in millimhos), available Nitrogen, Phosphorous, exchangeable Potassium, Magnesium, Calcium and Sodium, Cation Exchange Capacity, percent H base saturation, percent Ca base saturation, percent M base saturation, and available Zinc, Manganese, Copper, Iron, humus content and soil type. All nutrient results shall be expressed in parts per million (ppm).
    4. Test reports shall also contain specific recommendations as to the exact types and times and rates of application of soil additives and fertilizers based upon the soil test results. These recommendations shall be followed during lawn construction. All Contractors shall note that any and all materials and procedures, with respect to soil additives and fertilizers, contained herein are approximate and are given to assist bidding and that they will be adjusted to comply with test reports.
  - Paragraph 2.01.B – Loam shall be a "fine sandy loam", or a "sandy loam" determined by mechanical analysis. It shall be of uniform composition, without mixture of subsoil. It shall be free of stones, lumps, plants and their roots, debris and other extraneous matter over 13 mm (0.5 in) in diameter or excess quantities of smaller pieces of the same materials as determined by the Engineer. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well drained areas which have never been stripped before.
  - Paragraph 2.01.C - No more than 10 percent of loam shall be clay, with organic matter comprising not less than 4 percent, nor more than 20 percent of the total weight per load
  - Paragraph 2.01.D – Loam shall not be delivered or worked in a frozen or muddy condition.
  - Paragraph 2.01.E- Soluble salts shall not be higher than 75 parts per million.
  - Paragraph 2.04.A – Grass seed shall be fresh, clean new crop seed. It may be mixed by an approved method on the site or may be mixed by the dealer. If mixed on the site, each variety shall be delivered in the original containers which shall bear the dealers analysis. If the seed is mixed by the dealer, the Contractor shall furnish to the Engineer, the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety. Seed shall be adapted to the Mongolian climate and tested here.
  - Paragraph 2.04.B - The seed shall be furnished and delivered premixed in the proportions specified below. All seed shall comply with MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area, seed laws.



- Paragraph 2.04.C – Grass seed shall be the previous year's crop and in no case shall the weed seed content exceed 1 percent by weight.
- Paragraph 2.04.D – The seed mixture specified for slopes are for use on slopes graded at the rate of 4:1 and steeper slopes.
- Paragraph 2.04.E - A manufacturer's certificate of compliance to the specifications shall be submitted to the Engineer by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and sown until the contractor has submitted the certificates to the Engineer.
- Paragraph 2.04.F – Seed Mixture shall conform with standard locally available mix and shall be used for all loamed areas 17 g/m<sup>2</sup> (150 lb/acre). Seed mixture shall be in accordance with the following:
  - Seed contains mixture of 3 seeds of 2 species of Festuca and sedge (Cyperus).
- Section 02210, Earth Excavation, Backfill, Fill and Grading
  - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
  - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
  - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
  - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
  - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
  - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
  - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
  - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
  - Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
  - Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
  - Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
  - Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
  - Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.

- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction.

- **Contamination of biodiversity features via use and storage of potential pollutants:**

There is also a risk of habitat loss and degradation through accidental spills or seepages of hazardous substances (e.g. diesel fuel, oil, concrete, etc.). This impact would most likely occur within the project footprint, the land clearance, earthworks, construction area of facilities, and near worker facilities. Impacts on habitats arising from accidental spills and leakages would be of moderate magnitude of impact, depending on substance type, volume, and location of the accident.

  - The magnitude of impact would be moderate for the annual and perennial plant species, while the receptor sensitivity would be moderate due to their important role in provisioning and supporting ecosystem services. This would result in moderate impact significance for these vegetation communities in without the application of the best engineering practices not employed.
  - The magnitude of impact would be moderate for the *Salix* communities, while the receptor sensitivity would be high receptor sensitivity due to their important role in regulating and supporting ecosystem services. This would result in high impact significance for the *Salix* communities in case of no best engineering practices employed.
  - The magnitude of impact would be moderate for birds and mammals, although the receptor sensitivity is low due to their conservation status. This would result in moderate impact significance for birds and mammals, without best engineering practices employed.
  - The magnitude of impact would be moderate for Mongolian marmot (*Marmota sibirica*), although the receptor sensitivity is high due to their conservation status. This would result in high impact significance for Mongolian marmot (*Marmota sibirica*), without best engineering practices employed.
- However, Contractor implementation of best engineering practices for the site-specific emergency action plan, site specific hazardous management plan, disposal of debris, safeguarding of open excavations, protection of land resources, temporary sanitary conveniences and storage and handling of hazardous materials (technical specifications, Division 1 Section 01030, 01046, 01110, 01500 and 01610) and well installation plan best engineering practices (technical specifications, Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.04.D – 1) Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
    - 2) The Emergency Action Plan shall include, but not be limited to the following:
      - a. Identification of hazards and risks associated with the Project.
      - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
      - c. Contractor's standard operating procedures, including personnel training and field orientation.
      - d. Levels of protection and selection of equipment procedures.
      - e. Field monitoring of petroleum products and potential pollutants.
      - f. Contingency and emergency procedures.
      - g. Listing of emergency contacts

- Paragraph 1.04.E – 1) The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.

2) Certain chemical and physical agents (i.e., asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulatory agencies, the Contractor shall notify the Owner immediately of the nature of the incident.

3) The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:

  - a. The location of potential hazards.
  - b. The potential adverse health effects posted by such hazards.
  - c. Proper safe work practices to prevent or reduce potential exposure.
  - d. Proper protective measures and equipment required.
  - e. Proper use of protective equipment.
  - f. Proper response to exposure incidents.
  - g. Proper disposal of hazardous materials.

4) The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:

  - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
  - b. Hearing protection (plugs, muffs, etc.).
  - c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).
- Paragraph 1.21.A – During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- Paragraph 1.21.B – Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- Paragraph 1.21.C – At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.
- Section 01046, Control of Work
  - Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for

accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.

- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.04.A – Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas approved in the Construction Permit.
  - Paragraph 3.04.B – Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
  - Paragraph 3.04.C – Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
  - Paragraph 3.04.D – Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.
  - Paragraph 3.04.E - All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25 mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
  - Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.



- Paragraph 3.04.G - The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands. Where the Works will be in floodplains, the Contractor shall take into consideration the rainy season period and take such measures as necessary to provide safe access to storage and temporary facilities.. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- Paragraph 3.04.H - Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.
- Paragraph 3.04.I - All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.
- Section 01500, Temporary Facilities
  - Paragraph 3.03.A – Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
  - Paragraph 3.03.B – Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.
- Section 01610, Delivery, Storage and Handling
  - Paragraph 1.05.C – 1) The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.
    - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:  
Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
    - b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
    - c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.
    - d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
  - 2) Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.08.A - The Contractor shall submit a Well Installation Plan within 14 days after the Notice to Proceed. The Plan shall contain a description of Contractor's overall approach for the proposed pilot and finished boreholes, and constructing water-supply wells. The Plan shall also include a detailed description of Contractor's proposed means and methods for completing the Work specified herein, including photographs and/or drawings of the proposed equipment, tools, and supplies required to drill, sample, construct, develop, test, pump and inspect the Work.
  - Paragraph 1.08.B - The Well Installation Plan shall be approved and signed by an experienced Professional Hydrogeologist with expertise in water-well design and construction, and by the Engineer.
  - Paragraph 1.08.C The following shall be incorporated into the Contractor's Well Installation Plan and followed in the field. The plan shall include, but shall not be limited to, a discussion of the following:
    1. Proposed pilot borehole drilling, including methods of borehole installation, borehole diameter, soil-sampling, grain-size analysis, borehole geophysical surveying and borehole abandonment. It shall also include samples of the proposed report forms (geologic logs, grain-size analysis, borehole geophysical surveys, etc.)
    2. Description of proposed well-drilling methods for water-supply well boreholes, including methods to overcome well drilling challenges, well-installation procedures, including temporary casings proposed, well casing and screen installation, placement of artificial filter pack, transition pack and seal materials. It is recommended that the Contractor include a detailed description, including photographs, of the drilling rig and equipment proposed to perform the Work.
    3. The Contractor shall prepare a written Drilling Fluids Plan, subject to the review of the Engineer. The Drilling Fluids Plan shall describe the proposed additives to be used in the drilling fluid (for example, soda ash, bentonite, polymer); the proportions of these additives and method of mixing; and the proposed drilling fluid properties (pH, drilling-fluid weight, fluid-loss, viscosity and calcium content). The Drilling Fluids Plan shall also explain how the drilling fluids will work in harmony with the Contractor's drilling equipment with the overall goal of stabilizing the boreholes. The Drilling Fluids Plan shall describe the additives to be used to break down the filter cake once the well screen is installed and well development commences. Finally, the Drilling Fluids Plan shall include the name and experience record of the Drilling Fluids Engineer(s) who will monitor the drilling fluids for optimal performance throughout the drilling and well-construction process. It is recommended that the Contractor include a detailed description, including photographs, of the drilling mud mixing and circulation equipment proposed to perform the Work.
    4. In the Drilling Fluids Plan, the Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives.
    5. The Contractor shall submit for approval product data (see PART 2 – PRODUCTS) for: stainless steel well-casing and well-screens, centralizers and the products proposed for joining sections of well casing and screen (e.g., couplings or welding rods); water-supply source; artificial filter pack, transition pack; well sealant to be placed between the well casing and the borehole wall.
    6. Description of methods to be used to test for plumbness and alignment., in conformance with Paragraphs 3.06 H and J of this specification.

7. Description of methods and quality control procedures to be used for placement of the artificial filter pack, transition pack and seals in the borehole, including depth measurements.
8. Description of well development methods to be used, in conformance with Paragraphs 3.07 and 3.12G of this specification.
9. Description of performance pumping-test methods, in conformance with Paragraph 3.08 of this specification.
10. Blank Forms/Report Templates, including: Borehole Log form (for water-supply wells); Geologic Log form, Grain-size Distribution Curves, Borehole Geophysical Report form (for pilot boreholes); Final Well Design Report/Proposed Well Construction Diagram Template; Well-installation Diagram Template (As-Built Drawings), Plumbness and Alignment Test Record form; Well-development record form; Water-quality Sampling form; Pumping-test record form, Sand and Turbidity Testing form; Daily Activities Logs, Well Abandonment record form, and blank forms (paper and electronic spreadsheets) of tally sheets for drill strings, casings, tremie tubing cement, additives, filter pack materials, etc.
11. Description of contamination prevention, and well materials and equipment decontamination procedures.
12. Description of protective cover, surface completion procedures, including any special design criteria/features relating to frost heave prevention. The maximum frost penetration for the site shall be included in this description.
13. Description of water management methods, including any special design criteria/features relating to managing water from well drilling activities as well as pumping tests.
14. List of applicable publications, including GoM and local regulations and standards.
15. List of personnel assignments for this project, and personnel qualifications.
16. Description of well abandonment procedures.
17. Contractor's Health and Safety procedures.
18. Proposed source of water-supply for drilling.
19. Descriptions, materials of construction, drawings and layouts of proposed temporary drilling platforms and temporary access tracks, in conformance with Paragraph 3.04 D of this specification.
20. Floor plans, layouts, and other details related to temporary Field Offices, specified in SECTION 01500, TEMPORARY FACILITIES.
21. Details, descriptions, plans and layouts to be used for erosion and sedimentation control, as specified in SECTION 01568.

Assessment of potential impacts on biodiversity features during the construction phase is summarized in Table 7-44.

**Table 7-44 Assessment of Biodiversity Features Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Production well drilling</b>	Vegetation cover disturbance and removal.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Detours and road accessibility, Erosion control, prevention of environmental pollution, and traffic control, as specified in Technical specifications at Division 1 Section 01030, 01110, 01568, and 01063;	Low
	Fauna avoidance of noise and vibration from source	Birds* and mammals**	Low			Low	Low	Drilling preparation and performance pump testing best engineering practices as specified Technical specifications at Division 2 Section 02672;	Low
<b>Well construction</b>	Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Traffic control, and Cleaning up project site as specified in Technical specifications at Division 1 Section 01110, 01568, 01063 and 01710;	Low
		Birds* and mammals**	Low			Low	Low	Clearing and grubbing as specified in Technical specifications at Division 2 Section 02230;	Low
<b>Pipeline installation</b>	Vegetation cover disturbance and removal.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary	Moderate	Moderate	Erosion control, Protection of land resources, Hours of construction, and Safeguarding open excavations, Traffic control and final cleaning as specified in technical specifications, Division	Low
	Fauna avoidance of noise and vibration from source	Planted trees***	High			Moderate	High		Moderate
		Salix communities	High			Moderate	High		Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
	Spillage of engine fuel or other chemicals during operations.	Birds* and mammals**	Low		Frequency: Occasionally	Moderate	Moderate	1 Section 01110, 01568, 01046, 01063, and 01700;	Low
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High	Plants, Loam and seed, Planting, maintenance of seeded areas and planting, Loaming and seeding of disturbed area, Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and Backfilling as specified in technical specifications, Division 2 Section 02480, 02485 and 02210;	Moderate
Tuul river crossing	Vegetation cover disturbance and removal.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Erosion control, Protection of land resources, Hours of construction, and Safeguarding open excavations, Traffic control and final cleaning as specified in technical specifications, Division 1 Section 01110, 01568, 01046, 01063, and 01700;	Low
		Salix communities	High			Moderate	High		Low
	Spillage of engine fuel or other chemicals during operations.	Birds* and mammals**	Low			Moderate	Moderate	Plants, Loam and seed, Planting, maintenance of seeded areas and planting, Loaming and seeding of disturbed area, Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and Backfilling as specified in	Low



Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								technical specifications, Division 2 Section 02480, 02485 and 02210;	
Construction of AWPP facilities	Vegetation removal due to mass soil movement	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Safeguarding of open excavations and Erosion control, final cleaning as specified in Technical specifications at Division 1 Section 01046, 01110, 01568 and 01700;	Low
		Birds* and mammals**	Low			Moderate	Moderate		Low
	Fauna avoidance of noise and vibration from source	Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High		Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Erosion control barrier, Planting, and planting and Maintenance of trees, shrubs and ground cover as specified in Technical specifications at Division 2 Section 02210, 02268, 02480 and 02483;
	Mongolian marmot habitat areas lost and degradation								
	Spillage of engine fuel or other chemicals during operations.								
Temporary works camp	Habitat degradation	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Erosion control, Field office, Visitor center, Temporary perimeter fence, Temporary electrical, Temporary heat, Temporary sanitary conveniences, Site security, and Shelter and protection of materials, and Cleaning up project site as specified in Technical specifications at	Low
		Birds* and mammals**	Low			Low	Low	Low	

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								Division 1 Section, 01110, 01568 and 01500 and 01700;	
<b>Land clearance and earthworks</b>	Loss and degradation of habitat due to Increased soil excavation and dust emissions  Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Erosion control, Protection of land resources, Hours of construction, and Safeguarding open excavations, Traffic control and final cleaning as specified in technical specifications, Division 1 Section 01110, 01568, 01046, 01063, and 01700;	Low
		Salix communities	High			Moderate	High	Plants, Loam and seed, Planting, maintenance of seeded areas and planting , Loaming and seeding of disturbed area, Excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and Backfilling as specified in technical specifications, Division 2 Section 02480, 02485 and 02210;	Low
		Birds* and mammals**	Low			Moderate	Moderate		Low
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			High	High		Moderate
<b>Contamination of ecosystem</b>	Leaks and spills leading contamination of habitat	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration:	Moderate	Moderate	Site-specific emergency action plan, Site specific hazardous management plan Disposal of debris, safeguarding of open excavations, Protection of land resources, temporary sanitary	Low

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
		Salix communities	High		Temporary Frequency: Occasionally	Moderate	High	conveniences and Storage and handling of hazardous materials as specified in Technical specifications at Division 1 Section 01030, 01046, 01110 and 01500;	Low
		Birds* and mammals**	Low			Moderate	Moderate	Well installation plan as specified in Technical specifications at Division 2 Section 02672;	Low
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High		Low
<p><b>*Magpie (<i>Pica pica</i>), Rook (<i>Corvus frugilegus</i>), Red-billed chough (<i>Pyrrhocorax</i>), Black kite (<i>Milvus migrans</i>), Common kestrel (<i>Falco tinnunculus</i>), and Demoiselle crane (<i>Grus virgo</i>).</b></p> <p><b>** Daurian pika (<i>Ochotona dauurica</i>) and Long-tailed ground squirrel (<i>Spermophilus undulatus</i>)</b></p> <p><b>*** Planted trees which are located within protection zone of the finished water pipeline (see Figure 7-10)</b></p>									

## 7.7.6 Operation and Maintenance Impacts

- **Groundwater abstraction from wellfields:** Groundwater abstraction from production wells in Biokombinat and Shuvuun wellfields would not lead to further direct potential impacts on biodiversity features. Therefore, the magnitude of impact would be low for biodiversity features. Furthermore, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with *Special and Ordinary Protection and Sanitary Zones of Water Sources*, approved by joint decree A-230/127 of 2015, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Maintenance of pipeline and access:** Land clearance and earthwork activities for maintenance of pipelines are not anticipated to require removal of all vegetation with soils along pipeline compared with construction phase. Thus, disturbance for biodiversity features would be limited and occurred temporary at site scale. Therefore, the magnitude of impact would be low for biodiversity features. Thus:
  - The magnitude of impact would be low for the annual and perennial plant species, while the receptor sensitivity would be low due to their role in provisioning and supporting ecosystem services. This would result in moderate impact significance for these vegetation communities in without the application of the best engineering practices not employed.
  - The magnitude of impact would be low for the *Salix* communities, while the receptor sensitivity would be high receptor sensitivity due to their important role in regulating and supporting ecosystem services. This would result in moderate impact significance for the *Salix* communities in case of no best engineering practices employed.
  - The magnitude of impact would be low for birds and mammals, although the receptor sensitivity is low due to their conservation status. This would result in low impact significance for birds and mammals, were best engineering practices not employed.
  - The magnitude of impact would be low for Mongolian marmot (*Marmota sibirica*), although the receptor sensitivity is high due to their conservation status. This would result in moderate impact significance for Mongolian marmot (*Marmota sibirica*), were best engineering practices not employed.

Furthermore, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with MNS 5918:2008, MNS 5914 : 2008 and MNS 5916 : 2008, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible/ low/moderate.

- **Access road:** Access road would not generate direct potential impact to biodiversity features since current access road to two proposed wellfields, AWPP and ovoo have constructed or enhanced during the construction phase. However, there is the potential impact for vegetation around operational site and access roads to be contaminated via vehicle movements, potential spills, leakages and accidents. Although earthen berm would be constructed before construction phase, which reduce any impacts from access road to monument and ovoo for Mongolian marmot (*Marmota sibirica*) habitat. Therefore, this would be temporary and site scale. Additionally, noise and vibration emissions during operation would predominantly be generated by vehicle traffic using access road to the proposed two wellfields and AWPP site. The predicted extent is unknown; however, noise and vibration emissions are likely to be of lower levels during operation than construction. It is expected that these emissions will result in the continued displacement of mammals and some sensitive bird species from habitats near the road but is unlikely to significantly impact reptile species. Impacts on fauna from noise and vibration emissions during operation are expected to be of the low magnitude of impact.

- The magnitude of impact would be low for the annual and perennial plant species, while the receptor sensitivity would be moderate due to their important role in provisioning and supporting ecosystem services. This would result in low impact significance for these vegetation communities in without best engineering practices employed.
- The magnitude of impact would be low for the Salix communities, while the receptor sensitivity would be high receptor sensitivity due to their important role in regulating and supporting ecosystem services. This would result in moderate impact significance for the Salix communities in case of no best engineering practices employed.
- The magnitude of impact would be low for birds and mammals, and the receptor sensitivity is low due to their conservation status. This would result in low impact significance for birds and mammals, without best engineering practices employed.
- The magnitude of impact would be low for Mongolian marmot (*Marmota sibirica*), although the receptor sensitivity is high due to their conservation status. This would result in moderate impact significance for Mongolian marmot (*Marmota sibirica*), without best engineering practices employed.

Furthermore, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible/ low/moderate.

- **Solid and liquid disposal:** The residual handling facilities activities would be constructed under the design control of AWPP during the construction phase. Thus, residual handling activities would not generate potential impacts to biodiversity features during operation. However, operation of AWPP would impact to Mongolian marmot (*Marmota sibirica*) habitat area. Although earthen berm would be constructed before construction phase, which would reduce any impacts from AWPP operation to Mongolian marmot (*Marmota sibirica*) habitat. Thus, the magnitude of impact would be low for Mongolian marmot (*Marmota sibirica*), although the receptor sensitivity is high due to their conservation status. This would result in moderate impact significance for Mongolian marmot (*Marmota sibirica*), were best engineering practices not employed. However, Operator implementation of best engineering practices and management measures, consistent with those implemented during construction, as well as compliance with MNS 4943:2015 and MNS 6458:2014, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to moderate.

Assessment of potential impacts on biodiversity features during the operation and maintenance phase is summarized in Table 7-45.

**Table 7-45 Assessment of Biodiversity Features Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Groundwater abstraction from Wellfield</b>	No impacts	Annual and perennial plant species	Moderate		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development;	Negligible
		Birds* and mammals**	Low			Low	Low		Negligible
<b>Maintenance of pipeline</b>	Vegetation cover disturbance and removal.  Fauna avoidance of noise and vibration from source	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.;  MNS 5918:2008-The General Technical Requirements for Vegetation of Eroded Land; MNS 5914 : 2008- Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions; MNS 5916 : 2008- Topsoil stripping and storage during earthworks;	Low
		Salix communities	High			Low	Moderate		Low
		Birds* and mammals**	Low			Low	Low		Low
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Low	Moderate		Moderate
<b>Access road</b>	Fauna avoidance of noise and vibration from source	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration:	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures	Low
		Birds* and mammals**	Low			Low	Low		Low



Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
	Leaks and spills leading contamination	Mongolian marmot ( <i>Marmota sibirica</i> )	High		Temporary Frequency: Occasionally			implemented during construction.;	Moderate
Solid and liquid disposal:	Fauna avoidance of noise and vibration from source	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Low/Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.;	Negligible/low
		Birds* and mammals**	Low			Low	Low		
	Leaks and spills leading contamination	Mongolian marmot ( <i>Marmota sibirica</i> )	High			Low	Low		MNS 4943:2015- Effluent Wastewater Quality Standard MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals
*Magpie ( <i>Pica pica</i> ), Rook ( <i>Corvus frugilegus</i> ), Red-billed chough ( <i>Pyrrhocorax</i> ), Black kite ( <i>Milvus migrans</i> ), Common kestrel ( <i>Falco tinnunculus</i> ), and Demoiselle crane ( <i>Grus virgo</i> ).									
** Daurian pika ( <i>Ochotona dauurica</i> ) and Long-tailed ground squirrel ( <i>Spermophilus undulatus</i> )									

The potential impacts of BWSE project activities on biodiversity features have been identified and summarized in Table 7-43, Table 7-44 and Table 7-45.

As shown in Table 7-43, Table 7-44 and Table 7-45, the potential impact to biodiversity features in the Aol are likely to arise primarily during construction activities of the raw and finished water pipelines, wellfields, AWPP facilities and temporary facilities such as worker camps, through direct vegetation disturbance and removal, and degradation of fauna habitat associated with land clearance, earthworks, and construction activities during the construction phase.

Potential impacts from operations and maintenance activities related to the BWSE project would be limited. Where required, these activities would involve routine inspections, maintenance and monitoring of the production well, pipelines and AWPP activities.

As a result of the impact assessment of biodiversity features due to BWSE project activities, the significance of the residual impacts on flora and fauna would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

However, the application of the best engineering practices by the Contractor would not reduce to acceptable levels the significance of the residual impacts on the critical habitat area of Mongolian marmot (*Marmota sibirica*) nearby the AWPP site or on the planted trees along the finished water pipeline. This requires an additional mitigation measure in order to reduce the significance of the residual impacts. The additional mitigation measures is developed based on mitigation hierarchy concept of IFC PS6<sup>60</sup>. This would be discussed in Section 10.4.

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<sup>60</sup> Mitigation hierarchy includes appropriate avoidance, minimization, restoration and offset

## 7.8 Regional and Transboundary

### 7.8.1 Introduction

As discussed in Section 2.1.3.17, the Agreement on Protection and Use of Transboundary Waters was entered into by and between Mongolia and the Russian Federation in 1995. For the purposes of the agreement, the term *transboundary waters* is defined as “rivers, streams, lakes, and other surface waterbodies, as well as groundwater deposits through which the state border passes or crosses. As discussed in Sections 1.1 and 7.6, the BWSE project would be implemented downstream of UB in the upper Tuul River basin, which is one of the 29 River basins in Mongolia (see Figure 7-14).

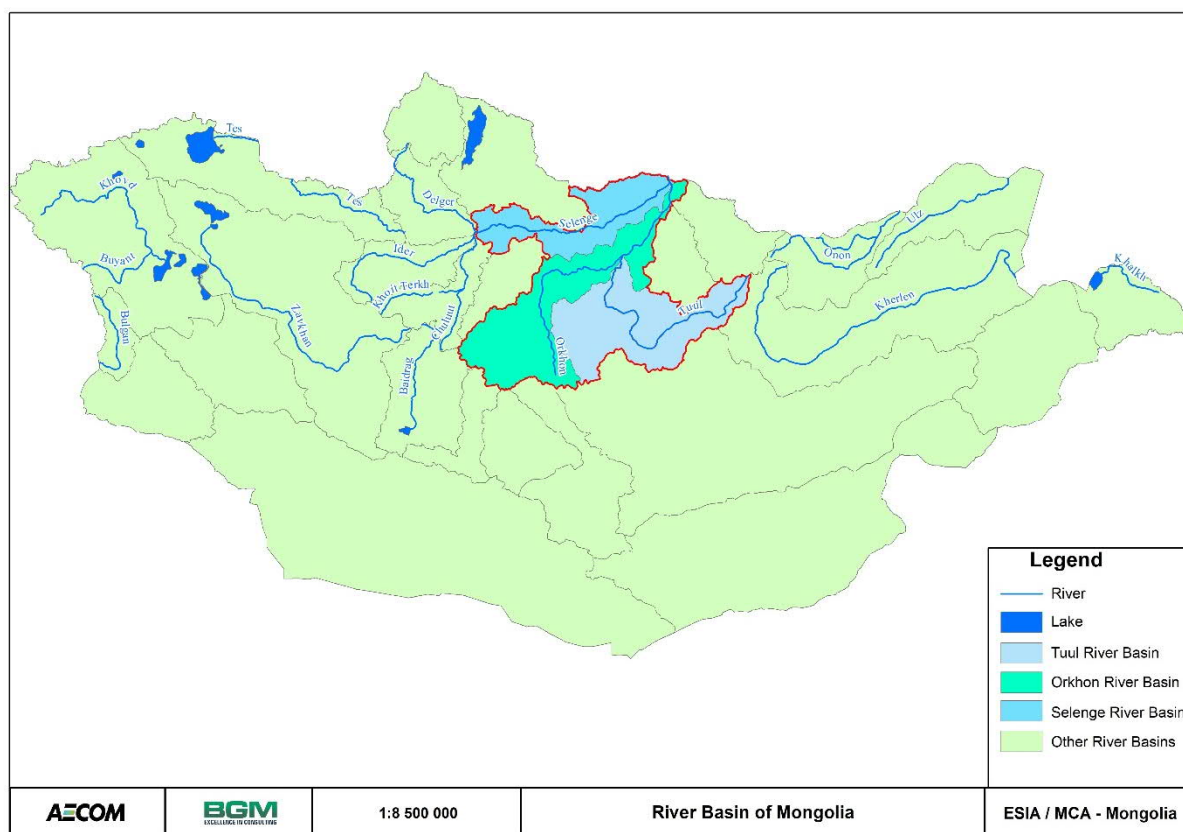


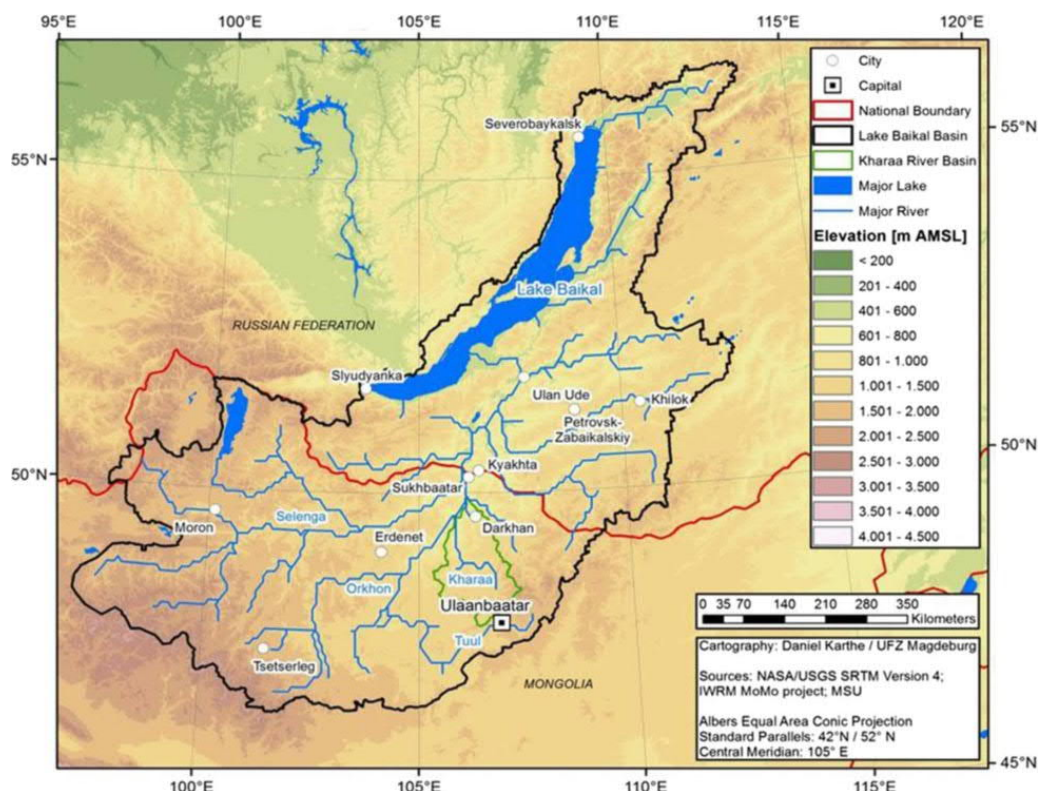
Figure 7-14 The 29 River Basin in Mongolia

The Tuul River originates in Khan-Khentii Nature Reserve in the Khentii Mountains in Erdene soum of Tuv aimag. The Tuul River flows into the Orkhon River, which flows into the Selenge River, and the Selenge then flows into Russia and finally into Lake Baikal (see Figure 7-15). Lake Baikal's most important tributary is the Selenge River, which contributes about 50-60 percent of its surface water influx (Nikolay et al., 2017).

Present and expected hydrological changes in the Selenge River basin are caused by land use changes (e.g., mining and agricultures), the impacts of climate change on regional precipitation and evaporation patterns, and permafrost decline and increased water withdraw (Nikolay et al., 2017). Similar hydrological changes would be expected in the Tuul River basin as discussed in Sections 6.1.8 and 8.1.

As discussed in Section 6.1.9.1, land use and human activity within and surrounding UB city contribute to water pollution in the Tuul River. For example, the CWWTP effluent, with high levels

of biological and chemical contaminants entrained, discharges into the main channel of the Tuul River.



**Figure 7-15 Map of the Tuul, Orkhon and Selenge Rivers and Tributaries in the Lake Baikal Basin**  
(Source: Nikolay et al., 2017)

As defined by IFC, potential transboundary impacts may be considered as “*impacts that extend to multiple countries, beyond the host country of the project, but are not global in nature. Examples include air pollution extending to multiple countries, use or pollution of international waterways, and transboundary epidemic disease transmission*” (IFC, 2012).

## 7.8.2 Assessment of Regional and Transboundary Impact

As discussed in Sections from 7.4 to 7.7, the ESIA report considered the potential impacts on environmental receptors such as soils, air quality, Tuul River surface water and ecosystem services (e.g., biodiversity features). As discussed in those sections, project-level potential impacts would occur in the vicinity of the BWSE project.

Table 7-46 presents a summary of the residual impact assessment as reported in Section 7 and identifies the residual impacts significance on defined receptors during the pre-construction, construction and operation and maintenance of the BWSE project.

**Table 7-46 Summary of the BWSE Project Residual Impact Significance**

Section	VEC	Pre-construction: Residual impact significance	Construction: Residual impact significance	Operation and Maintenance: Residual impact significance
Section 7.4	Soils	Negligible to Low	Low	Low
Section 7.5	Air	Low	Low	Low
Section 7.6	Water	Negligible	Low	Negligible to Low
Section 7.7	Biodiversity	Negligible to Low	Low to Moderate*	Negligible to Moderate*
* only for Mongolian Marmot habitat				

As shown in Table 7-46, the result of the impact assessment of receptors due to BWSE project activities, the significance of the residual impacts on receptors would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

Therefore, the defined potential impacts to environmental receptors from the BWSE project could not generate potential transboundary impacts. Therefore, significant transboundary impacts are not anticipated.

## 7.9 Noise

This section contains an assessment of the noise expected from activities undertaken on the BWSE project. As discussed in Section 3, the BWSE project consists of the following phases: pre-construction, construction and operational and maintenance. The impacts of each of these phases are considered separately. The activities of the BWSE Project are described in detail in Section 5. Main sources of noise during the pre-construction and construction phase would include vehicles, drilling machinery, heavy trucks, bulldozers and excavators used for drilling boreholes, land clearance, earthworks, pipeline installation, and construction of production wells and AWPP facilities.

During the operational and maintenance phase, the main sources of noise would be limited to activities associated with maintenance and repair, and noise from vehicles. In other words, activities of operational and maintenance are not anticipated to give rise to higher noise and vibration levels than those of the pre-construction and construction phase. The assessment has been undertaken to consider potential noise impacts applying the IFC HSE guidelines (e.g. IFC, 2007-General EHS guidelines: Environmental-section 1.7 Noise) and Mongolian standard (e.g. MNS 4585:2016). Table A-6 in Appendix A is a summary of the Mongolian standard and IFC EHS guidelines to community ambient noise levels.

### 7.9.1 Noise Receptor Sensitivity

The receptor sensitivity to noise and vibration depends mainly on the activities which occur at the receptor location. In other words, receptor sensitivity is determined according to the potential receptor's ability to adapt to the change in conditions and recover after exposure to noise and vibration. Receptors, such as local communities are usually considered as the most sensitive receptors in the Aol.

In addition to this, as discussed in Section 6.1.13.1, ecological receptors (e.g. Mongolian Marmot) have been identified in the area where proposed AWPP facilities and access road to ovoo would be constructed. The classification of receptor sensitivity for noise is shown in Table 7-47.

**Table 7-47 Noise and Vibration Receptor Sensitivity**

Receptor Sensitivity	Description
<b>Negligible</b>	Local communities or habitats and ecosystems which are not affected by noise and vibration.
<b>Low</b>	An area where local communities are not expected to be present over regular time or modified habitats of ecosystems which are not likely to be affected by noise and vibration
<b>Moderate</b>	An area where local communities are temporary present or natural habitat of ecosystems that could be affected by noise and vibration exceeding the relevant noise standard and guidance
<b>High</b>	Permanent local communities or critical habitats of ecosystems that could be affected by noise and vibration exceeding the relevant noise standard and guidance



## 7.9.2 Noise Impact Magnitude

It should be noted that the BWSE project components would be constructed in undeveloped areas (e.g. AWPP facilities and production wells at two proposed wellfields) and mixed residential and industrial areas. Therefore, this assessment uses the British Standards Code of practice for the noise levels affecting mixed residential and industrial areas for defining the noise impact magnitude (British Standard Institute, 2014a). Description of the criteria used to classify magnitude of potential impact for noise is presented in Table 7-48.

**Table 7-48 Ranking of Magnitude of Noise and Vibration Receptor Sensitivity**

Ranking of magnitude	Description
<b>Negligible</b>	Below and up to the baseline noise level
<b>Low</b>	1 to 3 dB(A) above the baseline noise level
<b>Moderate</b>	3 to 10 dB(A) above the baseline noise level
<b>High</b>	>10 dB(A) above the baseline noise level

It should be noted that the predicted construction noise levels are indicative and are subject to variables including locations, buildings, specifications of construction plant and works phasing.

## 7.9.3 Impact Assessment of Noise

As mentioned in Section 6.1.4.2, the measurement of the noise baseline level was carried out by ESIA team together with an expert from Central Laboratory for Environment and Monitoring. These measured baseline levels for the noise would be used in the assessment as baseline levels. As discussed in Section 6.1.7.7, there is a current potential source of noise due to ongoing gravel mining activities at the proposed Shuvuun wellfield site. However, it should be noted that this noise impact is not related to the BWSE project activities.

The assessment of potential impacts of the noise during the BWSE project phases have been undertaken based on the methodology described in Section 3. In addition to this, guidance presented in British Standards code of practice for noise control has been used in this assessment (British Standard Institute, 2014b).

This code of practice provides guidance and recommendations on methods of noise and vibration control associated with construction and operation (e.g. where work activities generate significant impacts) activities and assessing its potential impacts on those exposed to it. This assessment has considered the local communities as receptors.

Simple noise attenuation calculations are used to estimate noise levels on receptors located at various distances from the source. It should be noted that surrounding environmental factors influence noise attenuation (e.g. air pressure, reflection and absorption of surface materials), however this assessment assumed them as constant for simplicity.

The generic equation for adding noise levels is given below (British Standard Institute, 2014b).

$$dBA = 10 * \lg \left( 10^{\frac{dBA1}{10}} + 10^{\frac{dBA2}{10}} + \dots + 10^{\frac{dBAN}{10}} \right) \quad (Eq 1).$$

where: *dBA* - a total A-weighted sound level; *dBA1...n* - each individual source.

The noise level decreases as distance increases and it can be estimated using the equation below (British Standard Institute, 2014b).

$$dBA_2 = dBA_1 - 20 * \lg \left( \frac{R_2}{R_1} \right) \quad (Eq 2).$$



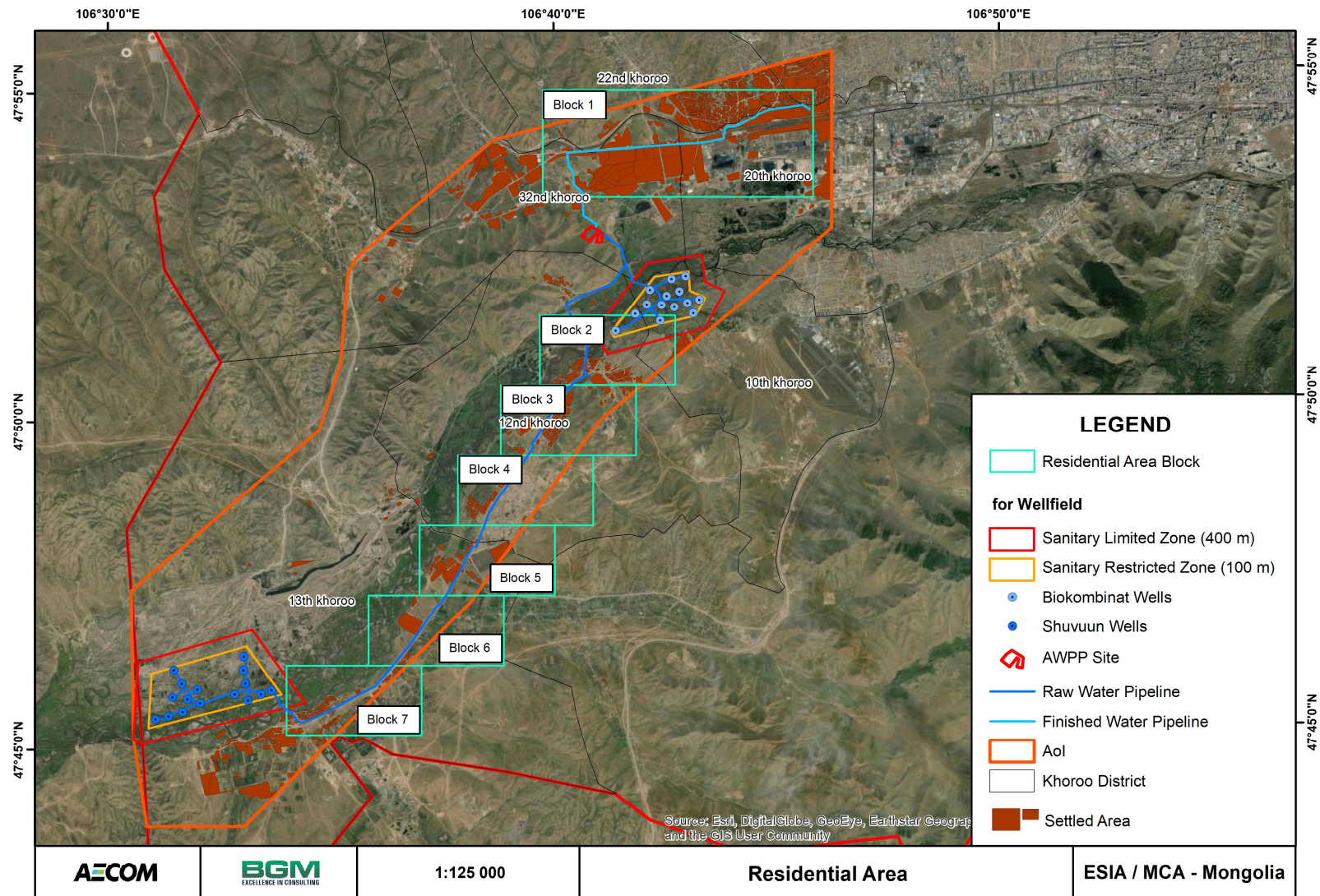
where:  $dB A_2$  – noise level at  $R_2$  distance from source;  $dB A_1$  - noise level at  $R_1$  distance from source.

In this assessment, the noise levels for the equipment that would be used during the BWSE phase are taken from reference sound levels presented in British Standards Code (British Standard Institute, 2014b).

As shown in Figure 7-16, Figure 7-17 and Figure 7-18, noise emissions are predicted to be associated with earthwork activities and construction works during the installation of raw and finished water transmission pipelines, production wells in Biokombinat and Shuvuun wellfields, and construction of AWPP facilities in the Aol. The BWSE project activities would cause short-term noise impact during the construction phase which would affect the residential areas near the BWSE project activities.

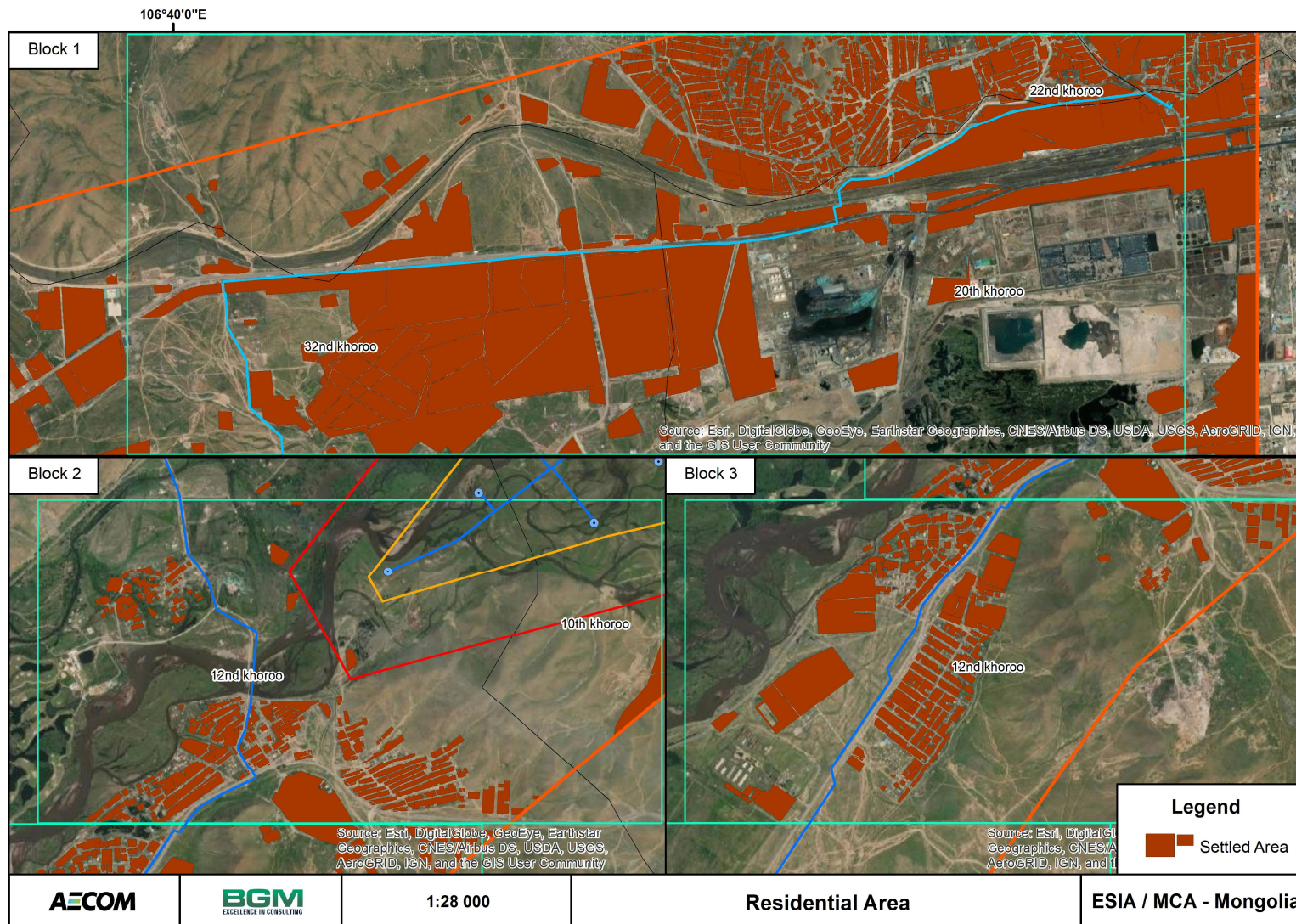
The figures below presents the residential areas (see Figure 7-16), which are divided into blocks to identify the potential impacts of the noise in each part of the areas where the BWSE project activities are planned:

- **Block 1:** The earthworks related to construction and installation of the finished water transmission pipelines are planned in this area. There are industrial and service facilities, and residential areas in the area. Also the main AH3 highway going west from UB passes through this area. This means that sensitivity of the receptors would be high if noise emissions increase in the area (see Figure 7-17).
- **Block 2:** The Biokombinat settlement center is located in this block. This area would be impacted by noise impacts as there are important residential areas with higher density of local population. Therefore, the receptor sensitivity would be high (see Figure 7-17).
- **Block 3:** This block includes the southern part of the Biokombinat settlement, as well as settlements along the north side of the main road to Shuvuun and military facilities in the northwest. The residents living along the main road would be more likely to be exposed to noise emissions during the construction phase of the project due to their closeness to the works. Therefore, the receptor sensitivity in the residential area would be high (see Figure 7-17).
- **Block 4:** The environmental condition in this area has been heavily degraded by a number of gravel mining activities being conducted to the southeast to the main road, as shown in Figure 7-4. Therefore, the existing conditions would become more problematic during the construction of the project facilities, leading to significant noise impact in this area. Thus, the sensitivity of the receptors in the residential area is considered to be high (see Figure 7-18).
- **Block 5:** This block is very sparsely populated and has a lot of commercial and industrial buildings. However, the receptor sensitivity would be high due to their proximity to the construction corridor of raw water pipeline installation (see Figure 7-18).
- **Block 6:** While there is fenced-off industry to the northwest of the road in this block, there are many agricultural plots located to the southeast of the road (see Figure 7-18). If significant noise emissions is generated due the BWSE project activities in this area, there would be negative impacts on the local communities. Therefore, the receptor sensitivity would be high (see Figure 7-18).
- **Block 7:** This block would be affected by the installation of raw water transmission pipelines, which would pass along the household plots northwest of the road. The noise emissions could adversely effect on residents. Therefore, the receptor sensitivity would be high (see Figure 7-18).



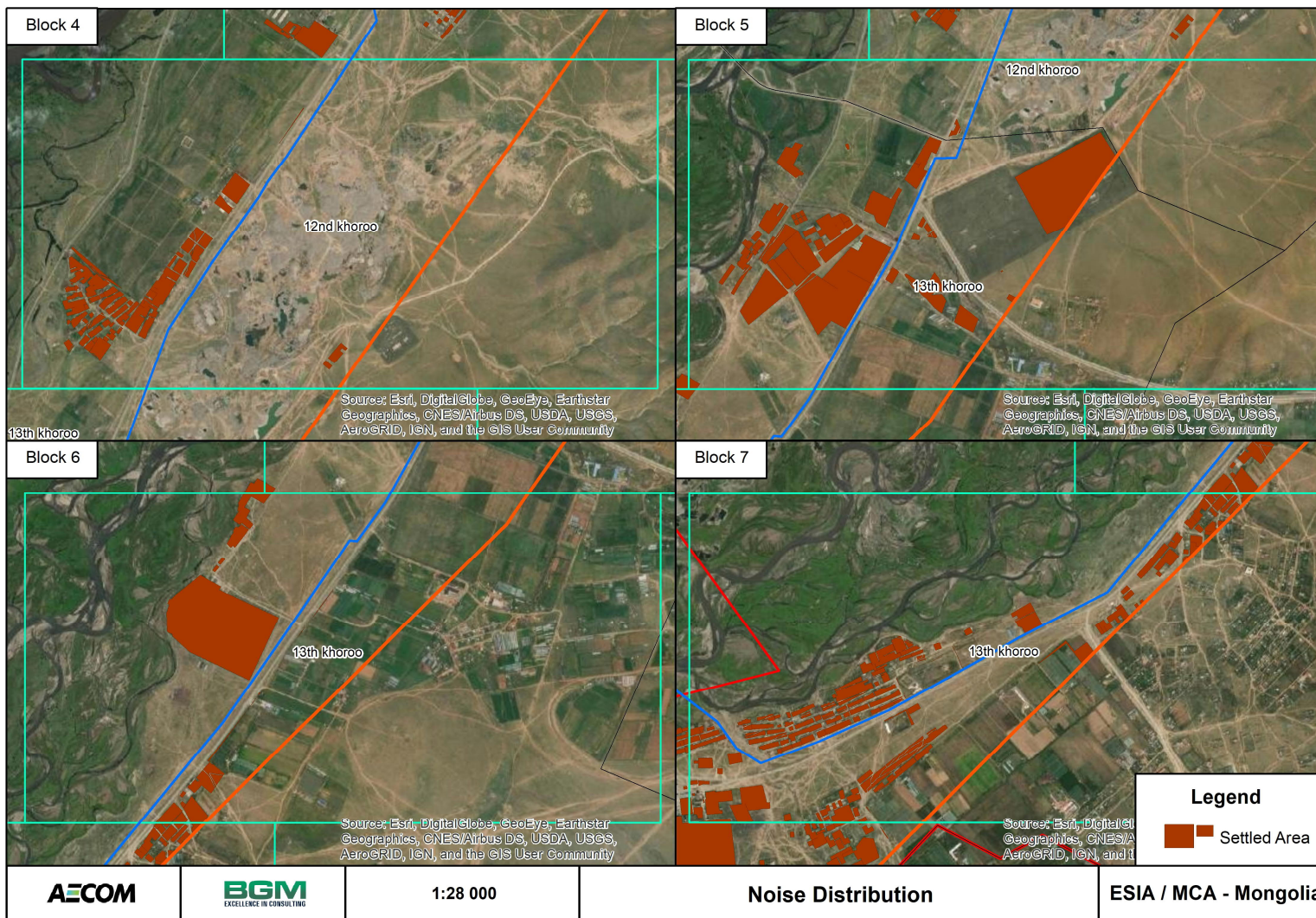
**Figure 7-16 Residential Area Blocks**





**Figure 7-17 Residential area**





**Figure 7-18 Residential area**

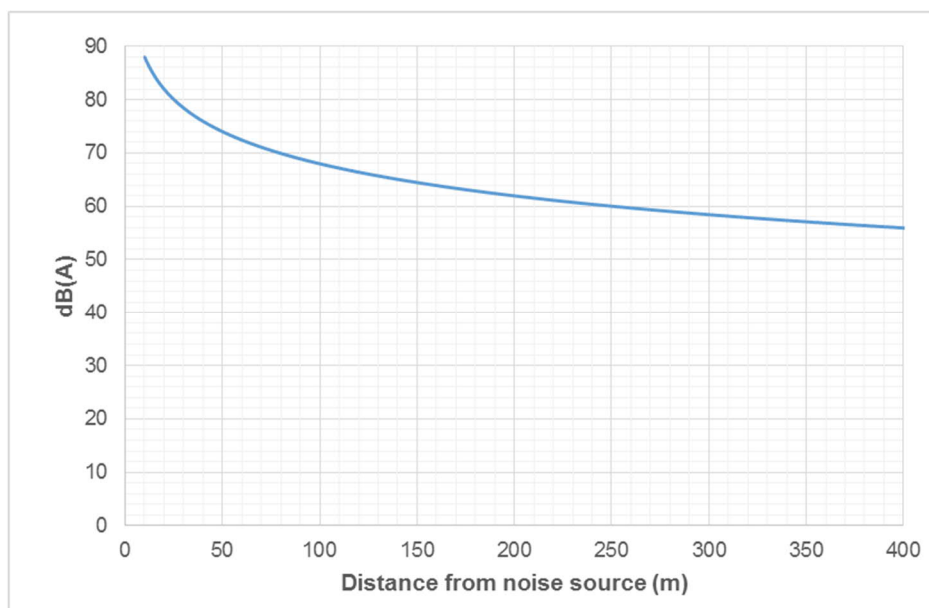
## 7.9.4 Pre-Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site

- **Exploratory and Test Well drilling, and Geophysical survey:** These activities occurred at proposed wellfields. The drilling process was expected to cause noise emissions due to vehicles and trucks driving to and from the wellfields. Noise emissions would be generated from both the movement of vehicles and drilling equipment. Noise emissions from vehicles movement would be less than drilling activities because drilling activities can be accounted as point with continuous noise source. The list of drilling equipment and its noise level is shown Table 7-49. Figure 7-19, Figure 7-20 and Figure 7-21 provided estimated noise propagation, as per equation 2, due to drilling activities at proposed two wellfields. Noise level of 88 dB(A) at the drilling site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 250 and 400 meters. It should be noted that there was no direct impact of the noise to local communities since no local communities are settled at the two proposed wellfields. Therefore, noise emissions from exploratory and test well drilling activities would likely be direct effect on drillers and workers. Therefore, the magnitude of impact would be moderate for drillers and workers, although the receptor sensitivity is high due to exposure to noise emissions. This would result in high impact significance for drillers or workers, if best engineering practices were not employed. However, health and safety management plan, site safety plan, emergency preparedness plan, task hazard assessments and best engineering practices were implemented by the field investigation teams to avoid or minimize potential adverse environmental impacts, thus reducing the anticipated residual impact significance to low.
- **Geotechnical, Topography and Geodesy survey:** These field investigations occurred along the raw and finished water pipelines, at the two proposed wellfields and the AWPP site. Noise emissions are generated due to vehicle movement during these surveys. Noise emissions from these activities would impact settled local communities along with the raw and finish water pipeline. However, these activities occurred temporarily, whereas the spatial extent of the impact is determined as a site scale. At the proposed wellfields and AWPP site, there was no direct impact to local communities since no local communities are there. Therefore, the magnitude of impact would be low for local communities and workers, while the receptor sensitivity is high due to exposure to noise emissions. This would result in moderate impact significance for local communities and workers, if best engineering practices were not implemented. However, health and safety management plan, site safety plan, emergency preparedness plan and regulation on operational safety during engineering-geological and geotechnical works of construction, including General Requirements: CR 12-102-04 and best engineering practices were implemented by field investigation teams to avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.

**Table 7-49 Estimated Noise level**

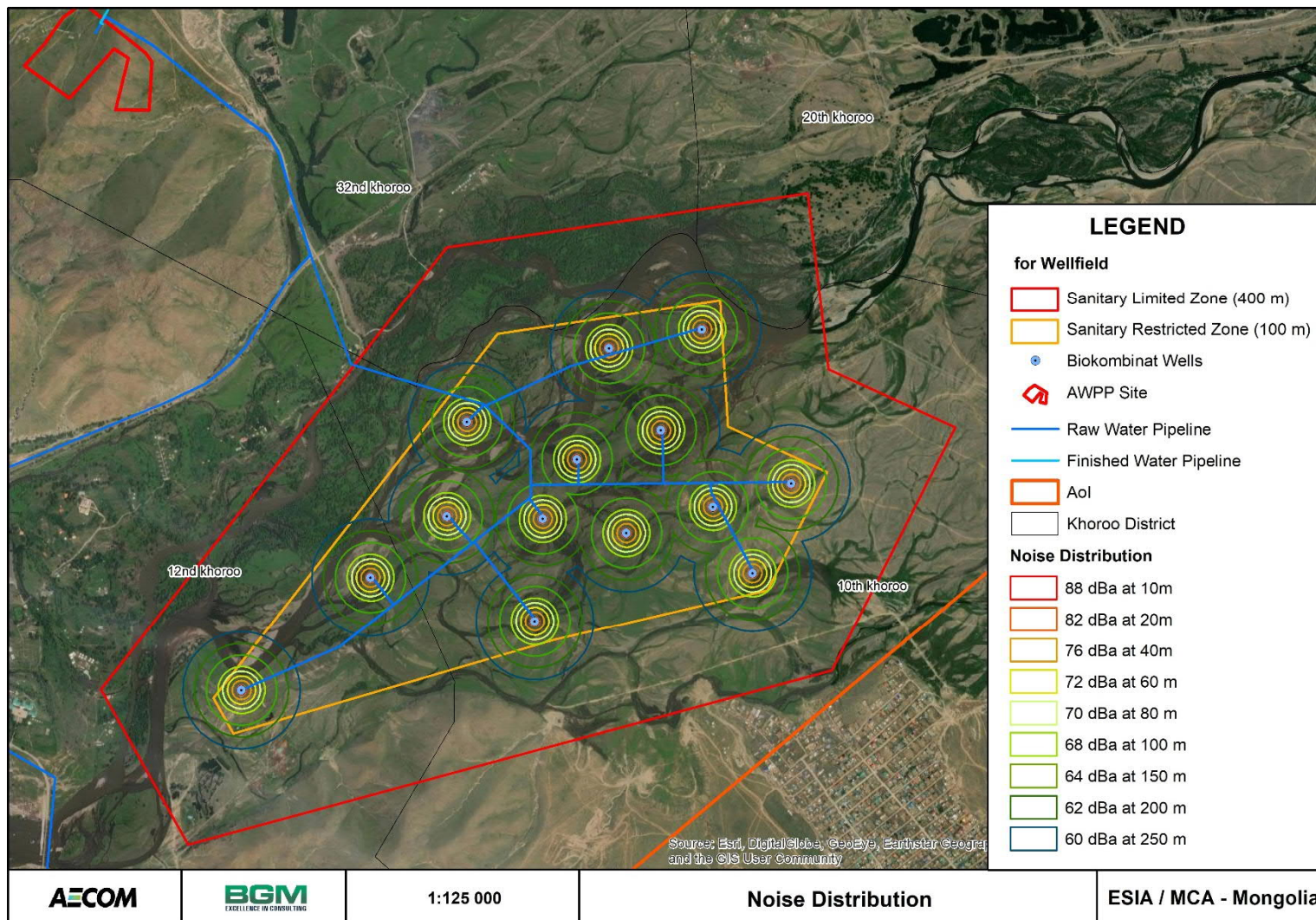
Equipment	Noise level dB (A) at 10 m from source
<b>Drilling activities</b>	
Hydraulic hammer rig 240 mm	88*
<b>Total*</b>	<b>88**</b>
<i>*Derived from British Standard Institute, 2014b</i> <i>**Total noise level is calculated by equation 1.</i>	



**Figure 7-19 Estimated Noise Propagation due to Drilling activities**

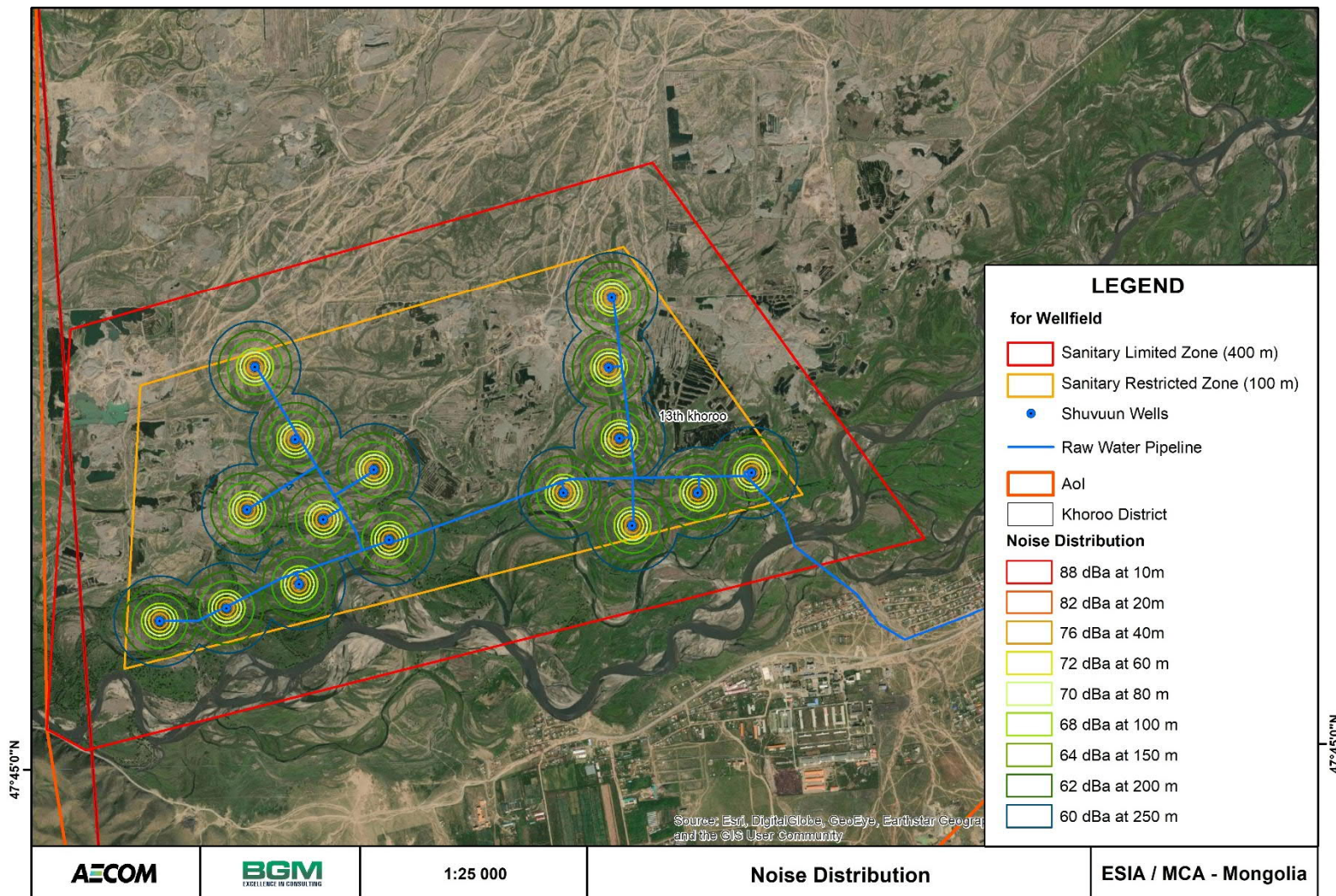
Assessment of potential impacts on noise emissions for the pre-construction phase is summarized in Table 7-50.





**Figure 7-20 Noise Propagation due to Drilling Activities at Biokombinat Wellfield**





**Figure 7-21 Noise Propagation due to Drilling Activities at Shuvuun Wellfield**

**Table 7-50 Assessment of Noise Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Exploratory and Test well drilling</b>	Noise emissions from vehicles movement and drilling activities.  Spillage of engine fuel or other chemicals during operations.	Driller and Worker	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Health and safety management plan; Site safety plan; Emergency preparedness plan; Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;	Low
<b>Geophysical survey</b>		Driller and Worker	High			Moderate	High		Low
<b>Geotechnical field survey</b>		Local communities and Workers	High			Low	Moderate		Low
<b>Topography and geodesy field survey</b>		Local communities and Workers	High			Low	Moderate		Low

## 7.9.5 Construction Impacts

### Wellfields, Raw and Finished Water Pipelines and AWPP Site:

- **Production well drilling:** The production well drilling activities would occur at the proposed Biokombinat and Shuvuun wellfield areas. The key source of noise emissions during the drilling activities would be vehicle and drilling equipment. However, there would not be direct impact to local communities in proposed two wellfield areas. It is important to note that there would not be disruption and nuisance to other road user due to increased traffic for construction activities since no local communities are exist in proposed two wellfields area. Therefore, the noise emissions source during the drilling activities would be limited, whereas the spatial extent of impact would be at site scale. Only the drillers and workers could be affected by noise emissions from drilling activities. Therefore, the magnitude of impact would be moderate for drillers and workers, although the receptor sensitivity is high due to exposure to noise. This would result in a high impact significance for the drillers or workers, were best engineering practices not employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, hours of construction, traffic control, noise control and drilling preparation and performance pump testing (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01063, 01110 and; Division 2 Section 02672) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
    - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
      - a) MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
      - b) MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
      - c) MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
      - d) MNS 4931:2000 Protective means. General requirement, classification.
      - e) MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
      - f) MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
      - g) BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
      - h) BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
      - i) BD 12-10-05 Safety guidelines to be followed for construction and installation works.
      - j) MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
      - k) Labor code of Mongolia.
      - l) Law of Mongolia on Toxic Hazardous Chemicals
    - 3) The Health and Safety Plan shall include, but not be limited to the following:

- a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
  - b. Identification of hazards and risks associated with the Project.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
- 4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
- 5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
- 6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.
- Section 01046, Control of Work
    - Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
    - Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
  - Section 01063, Miscellaneous Requirements
    - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
    - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.



- Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.07.A – The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer
  - Paragraph 3.03.A - Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.
  - Paragraph 3.04.A - *Decontamination Before Mobilization*: The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
  - Paragraph 3.04.B - *Staging of Well Installation and Construction Materials*: During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable substitute, so the materials will not come in contact with the ground. Materials, tools and casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.
  - Paragraph 3.04.C - *Disinfection During Construction*: The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.
  - Paragraph 3.04.D - *Temporary Access Tracks and Drilling Platform*: 1) The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to



execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer. 2) Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.

- Paragraph 3.04.E – Water Resource: Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.
- Paragraph 3.08.A – *Pumping test*:
  - 1. Pumping test procedure:
    - a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.
    - b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)
    - c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease, soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.
    - d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.
    - e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria are detected, the Contractor shall re-chlorinate and analyze samples as many times as is

necessary to obtain negative bacteria results, at no additional cost to Owner.

f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:

- Prior to startup of test (static water level)
- After 30 seconds
- One minute to 10 minutes: once every minute
- Ten minutes to 100 minutes: once every 10 minutes
- One hundred minutes to 4 hours: once every 30 minutes
- Four hours to 12 hours: once every hour
- Twelve hours to shut down: once every 2 hours
- Prior to shutdown of test.

g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.

h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.

i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.

j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.

k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.

○ 2. Pumping equipment:

a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.

b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall

be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.

○ 3. Discharge pipeline and flow measurement:

a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.

b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back into the well being pumped and influence the drawdown readings of the well being tested.

c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.

d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.

e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.

f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.

○ 4. Pumping test records:

a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s)

(in liters per second); the orifice head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.

b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.

- **Production well construction:** The noise would be emitted during the construction activities of the production wells at the proposed two wellfields. It should be noted that there would not be direct impact on local communities at the proposed two wellfields since no permanent local communities are settled there. In addition to this, there would not direct of disruption and nuisance to other road users. Only the workers could be affected by emitted noise due to construction activities. Therefore, the magnitude of impact would be low for construction workers, while the receptor sensitivity is high due to exposure to noise emissions. This would result in a moderate impact significance for the construction workers in the case of no best engineering practices employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, hours of construction, traffic control, noise control, cleaning up project site and clearing and grubbing (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01063, 01110, and 01710; Division 2 Section 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements

- Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.

2) Contractor shall be cognizant of the minimum standards norms set forth as follows:

- a. MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
- b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
- c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
- d. MNS 4931:2000 Protective means. General requirement, classification.
- e. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
- f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
- g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
- h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
- i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
- j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
- k. Labor code of Mongolia.
- l. Law of Mongolia on Toxic Hazardous Chemicals

3) The Health and Safety Plan shall include, but not be limited to the following:

- a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.

- b. Identification of hazards and risks associated with the Project.
- c. Contractor's standard operating procedures, including personnel training and field orientation.
- d. Respiratory protection training requirements.
- e. Levels of protection and selection of equipment procedures.
- f. Type of medical surveillance program.
- g. Personal of hygiene requirements and guidelines.
- h. Zone delineation of the Project site.
- i. Site security and entry control procedures.
- j. Field monitoring of site contaminants.
- k. Contingency and emergency procedures.
- l. Listing of emergency contacts.

4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.

6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

○ Section 01046, Control of Work

- Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.

○ Section 01063, Miscellaneous Requirements

- Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
- Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
- Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.07.A – The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
    2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
    3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
    4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
    5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.



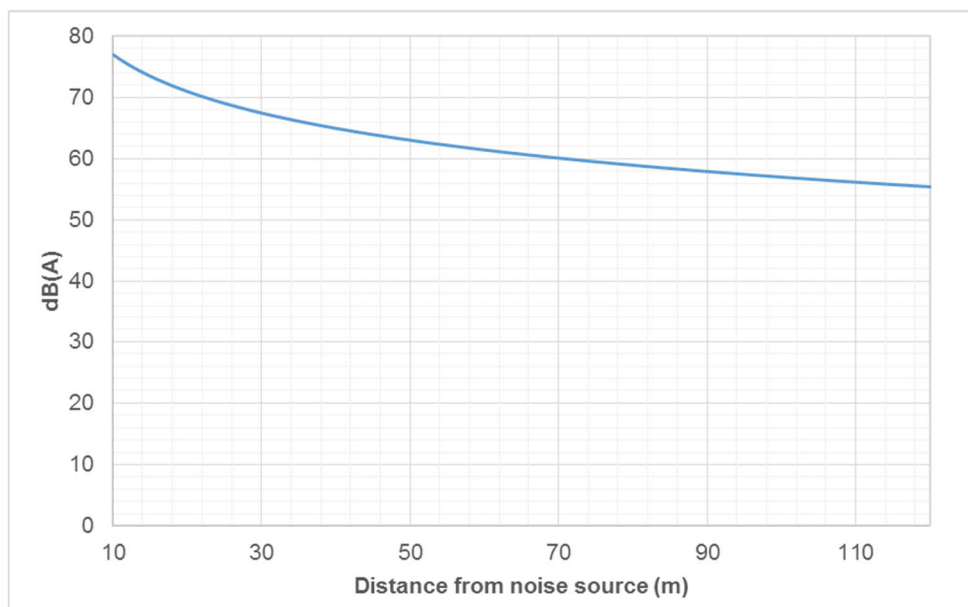
- Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- **Pipeline installation and Tuul River crossing:** During the installation of raw and finished water pipelines, there would be temporal noise emissions due to trenching, installation of pipes and backfilling activities. The list of trenching equipment and its noise level is shown in Table 7-51. Figure 7-22, Figure 7-23 and Figure 7-24 presented estimated noise propagation by equation 2 due to trenching, pipeline installation and backfilling activities.
    - Noise level of 77 dB(A) at the trenching site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 70 and 120 meters (see Figure 7-25, Figure 7-26, Figure 7-27).
    - Noise level of 82 dB(A) at the pipeline installation site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 115 and 200 meters (see Figure 7-28).
    - Noise level of 82.4 dB(A) at the backfilling after pipeline installation activities would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 130 and 210 meters (see Figure 7-29).

It should be noted that there was no direct impact of the noise to local communities since no local communities are settled where Tuul river crossing activities would occur. It is considered to be significant, with the potential to affect workers on-site. However, impact on off-site receptors would be minimal given the distance from actual construction working corridor, except for parts of Blocks 1, 2, 3, and 7 due to proximity and local community density (see Figure 7-16, Figure 7-17 and Figure 7-18). The proposed pipeline construction area is relatively flat with soft soil, limiting the need of heavy earth moving and trenching equipment. Noise emissions would also be generated from heavy vehicles used for transportation of materials to and from the site and at the site (see Figure 7-39). In addition to this, disruption and nuisance to other road users would be very limited due to very low traffic density on the local roads.

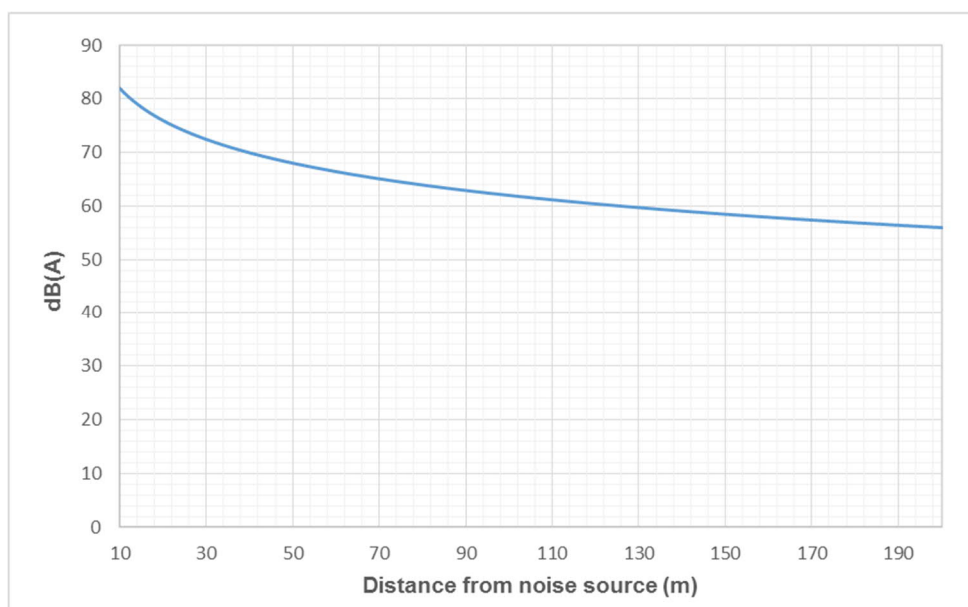
Table 7-51 Estimated Noise level

Equipment	Noise level dB (A) at 10 m from source
<b>Trenching activities</b>	
Tracked Excavator 25 t	77*
<b>Total</b>	77**
<b>Installation of Pipeline</b>	
Tracked Crane 25 t	82*
<b>Total</b>	82**
<b>Backfilling activities</b>	

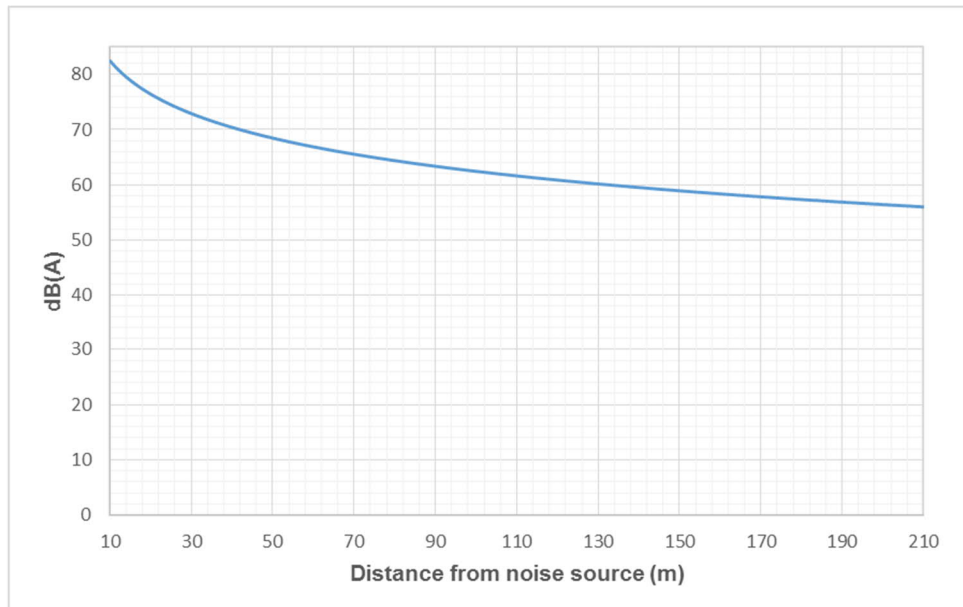
Dozer 20 t	81*
Tracked Excavator 25 t	77*
Total	82.4**
*Derived from British Standard Institute, 2014b **Total noise level is calculated by equation 1.	



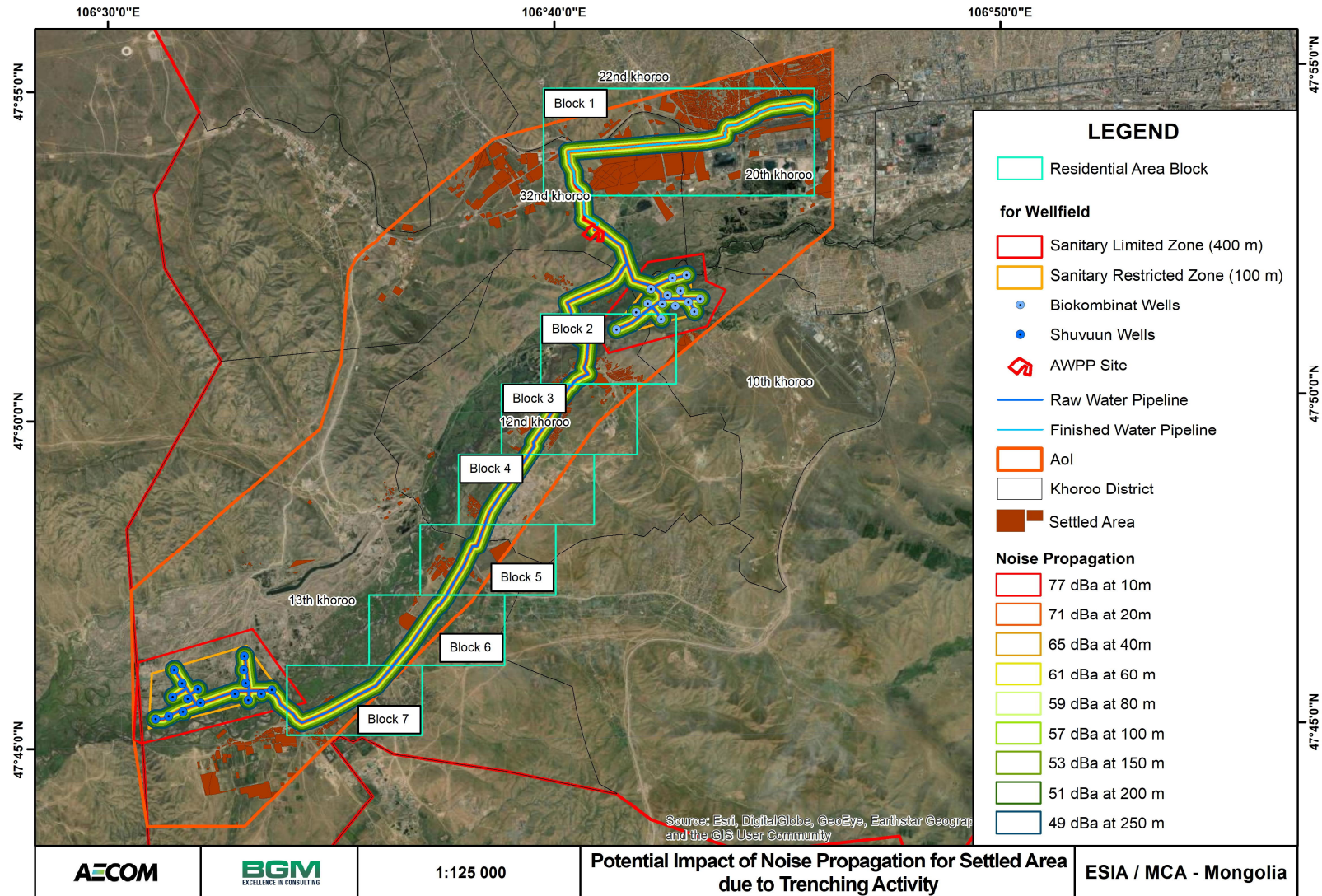
**Figure 7-22 Estimated Noise Propagation due to Trenching activities**



**Figure 7-23 Estimated Noise Propagation due to Installation Pipeline Activities**

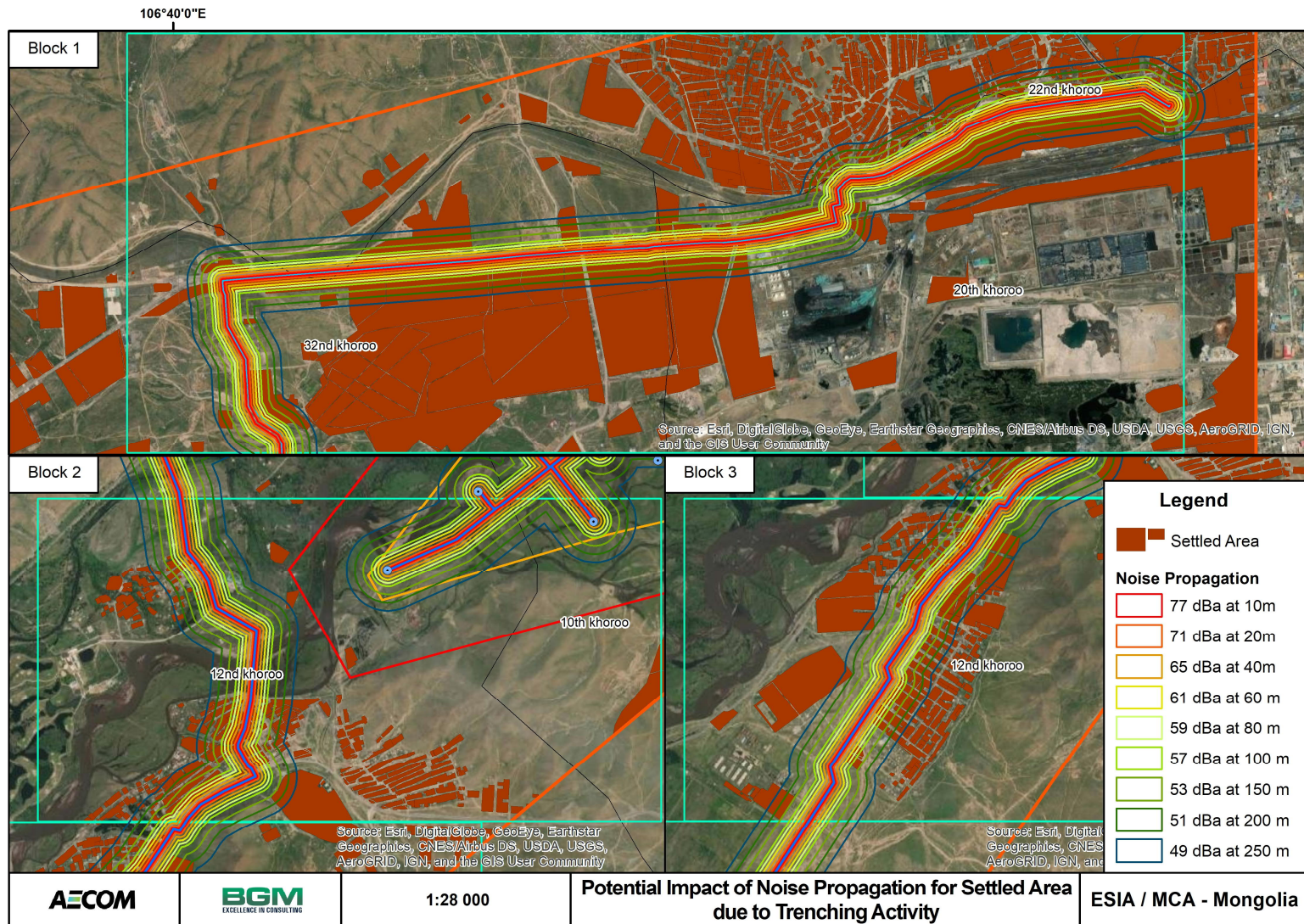


**Figure 7-24 Estimated Noise Propagation due to Backfilling Activities**



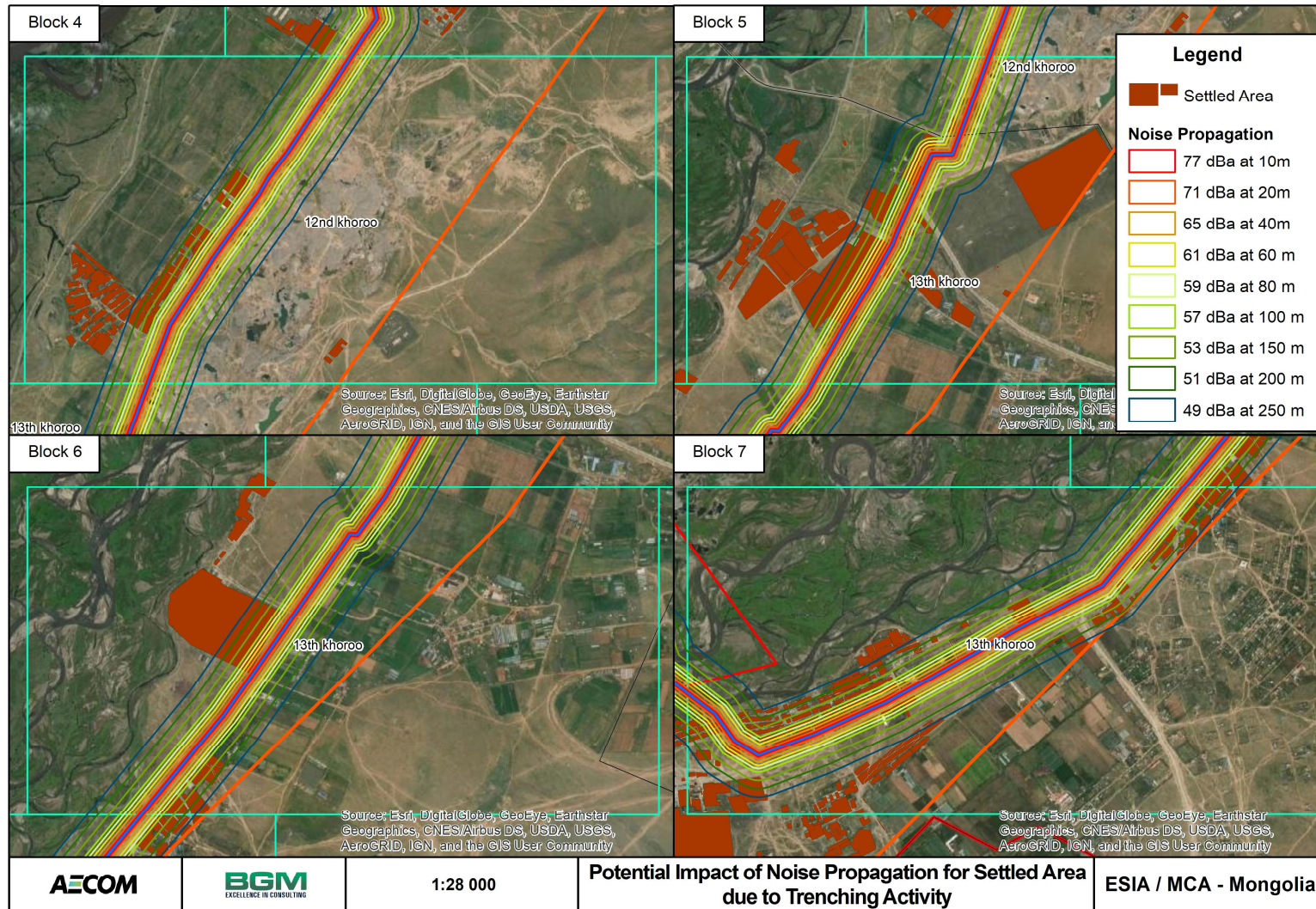
**Figure 7-25 Noise Propagation due to Trenching Activities**





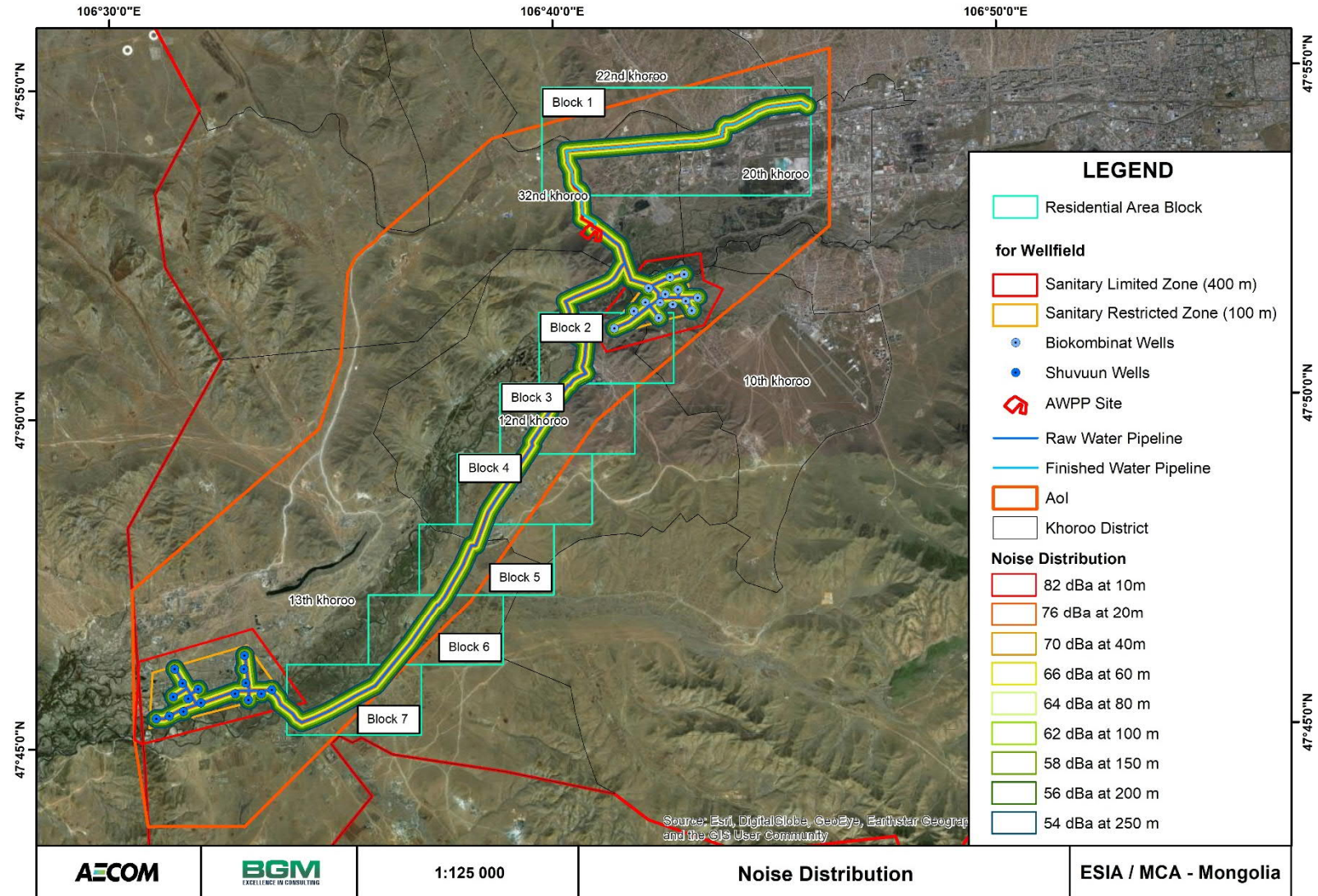
**Figure 7-26 Noise Propagation due to Trenching Activities**





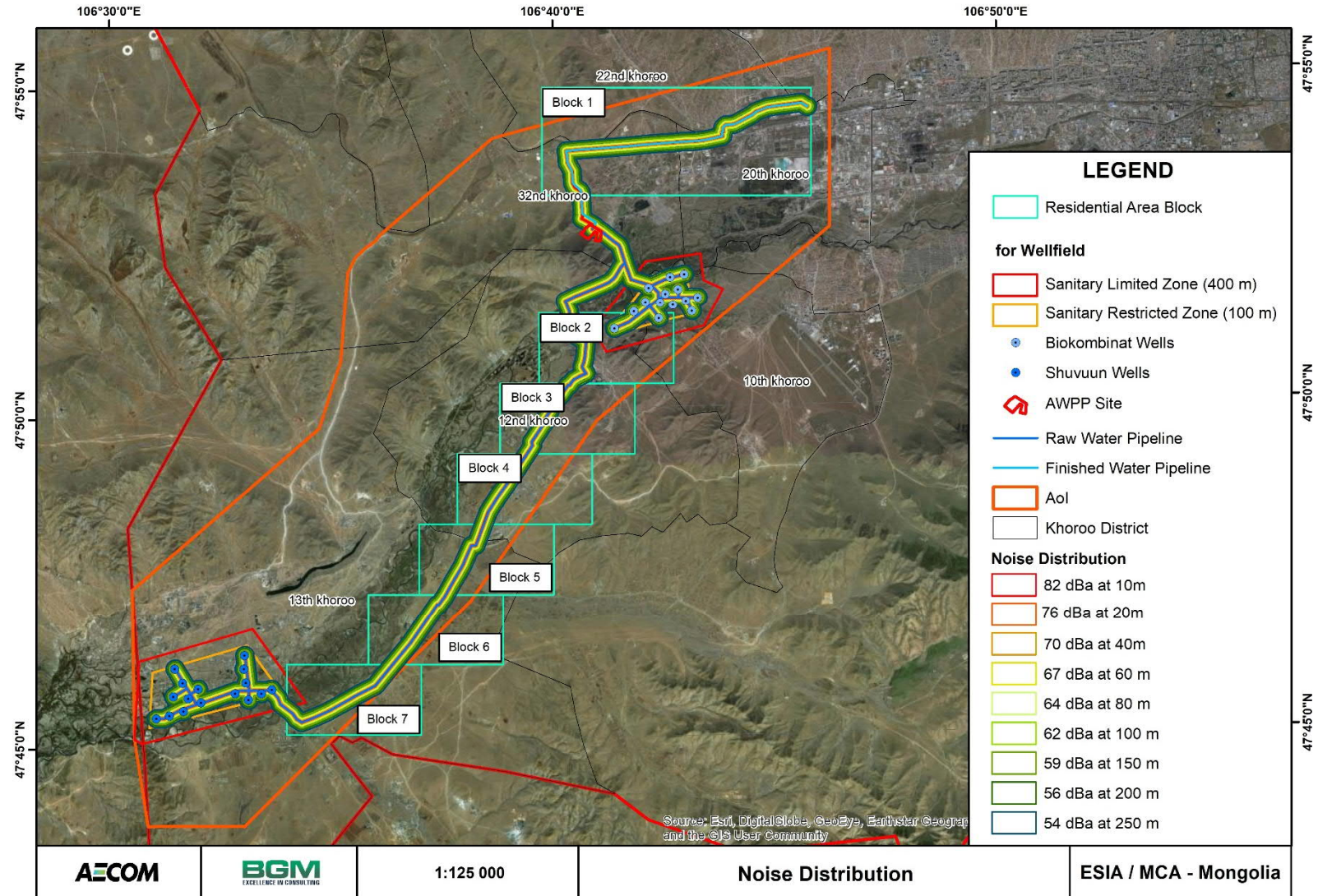
**Figure 7-27 Noise Propagation due to Trenching Activities**





**Figure 7-28 Noise Propagation due to Pipeline Installation Activities**





**Figure 7-29 Noise Propagation due to Backfilling Activities**

- These noise emissions would not be expected to be significant. However, duration of these activities would be short term (i.e. limited to construction period) and the spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for the workers and local communities, while the receptor sensitivity is high due to exposure to noise. This would result in high impact significance for the construction workers and local communities without the application of best engineering practices employed. However, Contractor implementation of best engineering practices for site-specific health and safety plan, hours of construction, safeguarding open excavations, traffic control, noise control, erosion control, and cleaning up project site (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01110, 01568, 01063 and 01710), and clearing and grubbing and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02210 and 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:
  - Section 01030, Special Requirements
    - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
    - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
      - m) MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
      - n) MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
      - o) MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
      - p) MNS 4931:2000 Protective means. General requirement, classification.
      - q) MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
      - r) MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
      - s) BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
      - t) BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
      - u) BD 12-10-05 Safety guidelines to be followed for construction and installation works.
      - v) MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
      - w) Labor code of Mongolia.
      - x) Law of Mongolia on Toxic Hazardous Chemicals
    - 3) The Health and Safety Plan shall include, but not be limited to the following:
      - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
      - b. Identification of hazards and risks associated with the Project.
      - c. Contractor's standard operating procedures, including personnel training and field orientation.
      - d. Respiratory protection training requirements.

- e. Levels of protection and selection of equipment procedures.
- f. Type of medical surveillance program.
- g. Personal of hygiene requirements and guidelines.
- h. Zone delineation of the Project site.
- i. Site security and entry control procedures.
- j. Field monitoring of site contaminants.
- k. Contingency and emergency procedures.
- l. Listing of emergency contacts.

4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.

6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

o Section 01046, Control of Work

- Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

- Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
- Section 01110, Environmental Protection Procedures
  - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
  - Paragraph 3.07.A – The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.
- Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
  - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
  - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
  - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
- Section 01710, Cleaning Up
  - Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
    1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
  3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
    - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
    - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
    - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
    - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
    - Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
    - Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
    - Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
    - Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.



- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.

- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- **Land clearance, earthworks and construction of facilities of the BWSE project:** The facilities of the BWSE project would include buildings for AWPP, brine sewer, production well pumphouses, and 10 kilovolt power distribution lines at the wellfields. However, it is important to note that large areas around the sites of the above-mentioned project components are essentially undeveloped. In addition to this, temporary work camps for Contractors would be required. The key sources for noise in the Aol would be raised due earthworks activities prior to the construction activities for BWSE project facilities. The estimated noise propagation during the trenching activities for pipeline installation are presented in Figure 7-22 and Figure 7-25. Furthermore, earthworks would be required for site preparation of the AWPP facilities construction. Thus, noise emissions would be generated during these activities due to the heavy vehicle and equipment operations at the sites.  
The list of equipment and it noise level is shown in Table 7-52. Figure 7-30, Figure 7-31, Figure 7-32, Figure 7-33 and Figure 7-34 presented estimated noise propagation by equation 2 due to earthwork for AWPP site and access road to AWPP site, construction

works for AWPP facilities and access road to AWPP site, and construction material transportation to the site.

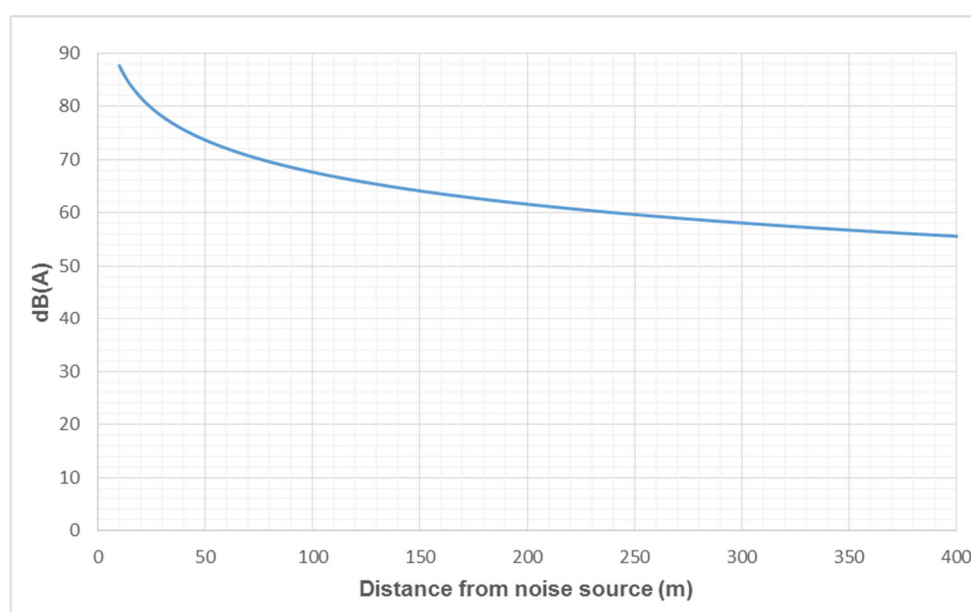
- Noise level of 88.5 dB(A) at the earthwork for AWPP site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 250 and 400 meters (see Figure 7-35).
- Noise level of 82.1 dB(A) at the construction work for AWPP site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 110 and 210 meters (see Figure 7-36).
- Noise level of 87.8 dB(A) at the pipeline installation site would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 220 and 390 meters (see Figure 7-37).
- Noise level of 81.7 dB(A) at the backfilling after pipeline installation activities would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 130 and 210 meters (see Figure 7-38).
- Noise level of 87.64 dB(A) at the backfilling after pipeline installation activities would be decreased to 60 dB(A) (MNS 4585:2016-day time standard) and 55 dB(A) (IFC EHS guidance - day time standard) levels at 215 and 380 meters (see Figure 7-39).

However, duration of these activities would be short term (i.e. limited to construction period). In addition to this, disruption and nuisance to other road users would be very limited due to very less traffic density on the local roads. The spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for the workers and local communities, while the receptor sensitivity is high due to exposure to noise. This would result in high impact significance for the construction workers and local communities without the application of best engineering practices.

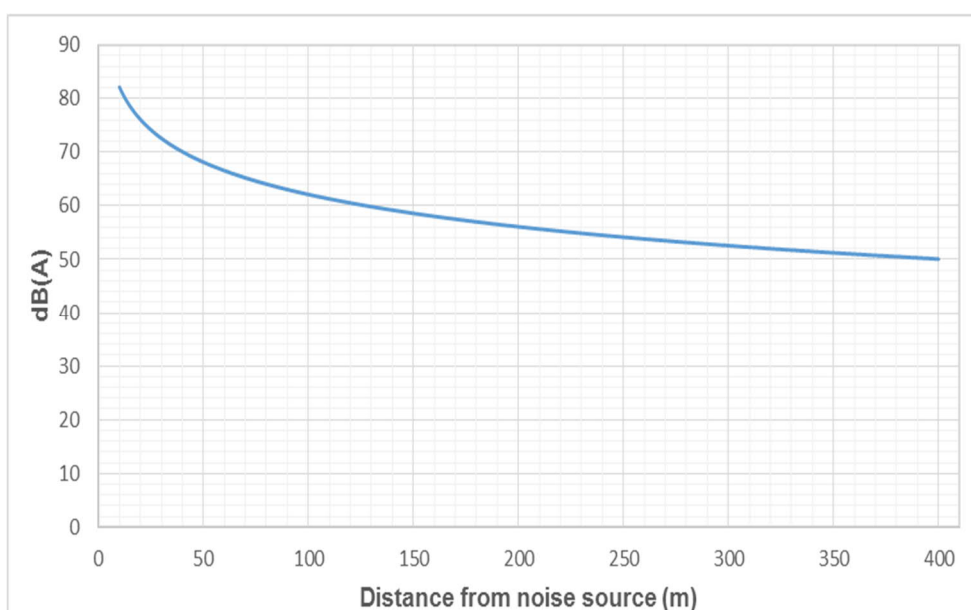
**Table 7-52 Estimated Noise level**

Equipment	Noise level dB (A) at 10 m from source
<b>Earthwork activities at AWPP site</b>	
Dump truck (tipping fill)	79*
Dump truck (empty)	87*
Dozer 20 t	81
Tracked excavator	96
Total	88.5**
<b>Construction work activities at AWPP site</b>	
Large concrete mixer 26 t	76*
Concrete pump	78*
Tower crane	77*
Tracked mobile crane 55 t	70*
<b>Total</b>	82.1**
<b>Earthwork activities for Access road to AWPP site</b>	
Bulldozer 24 t	83*
Tracked excavator	69*
Grader	86*
Road roller 22 t	80*
Total	87.82**

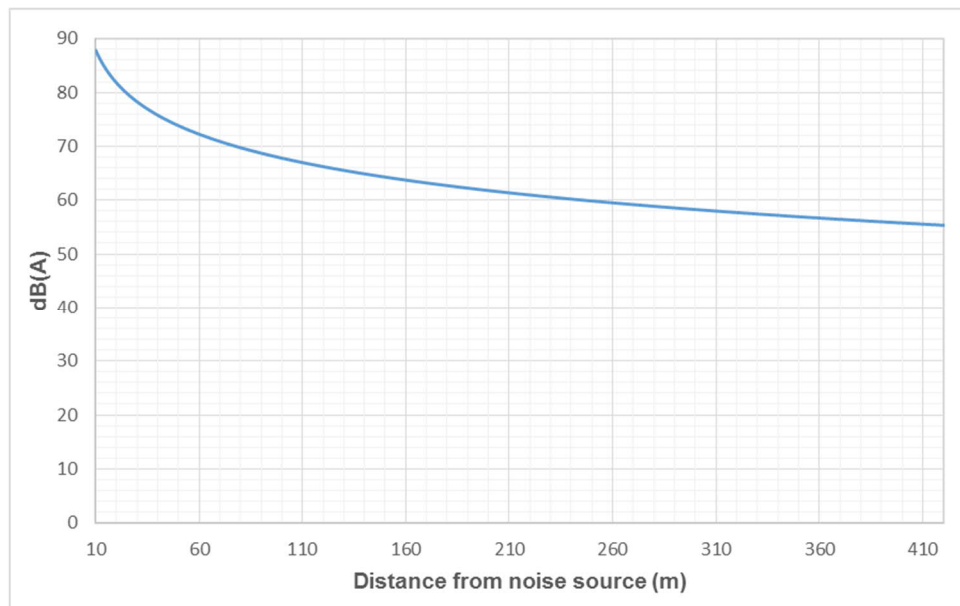
Equipment	Noise level dB (A) at 10 m from source
<b>Construction work activities for Access road to AWPP site</b>	
Asphalt paver (+ tipper lorry)	77*
Road roller 22 t	80*
Total	81.76**
<b>Material transporting to Site</b>	
Truck (tipping fill)	79*
Truck (empty)	87*
Total	87.6**
*Derived from British Standard Institute, 2014b	
**Total noise level is calculated by equation 1.	



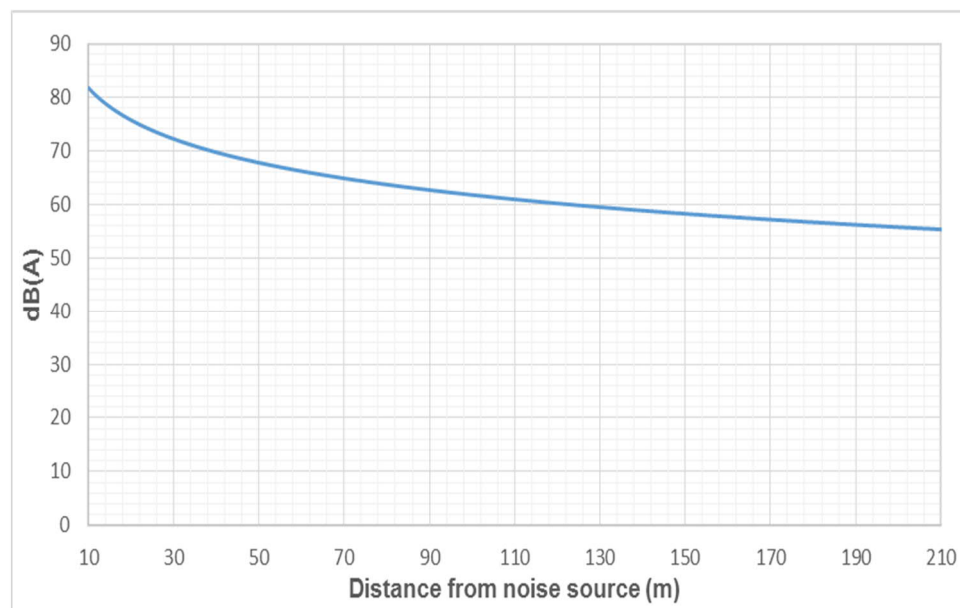
**Figure 7-30 Estimated Noise Propagation due to earthwork at AWPP site**



**Figure 7-31 Estimated Noise Propagation during the construction work at AWPP site**

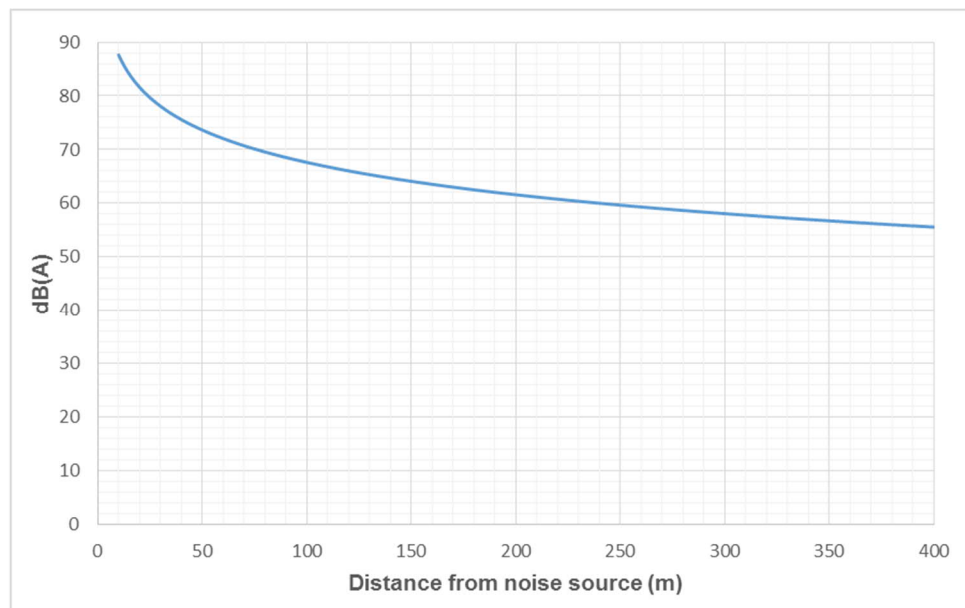


**Figure 7-32 Estimated Noise Propagation due to Earthwork for Access Road to AWPP Site**

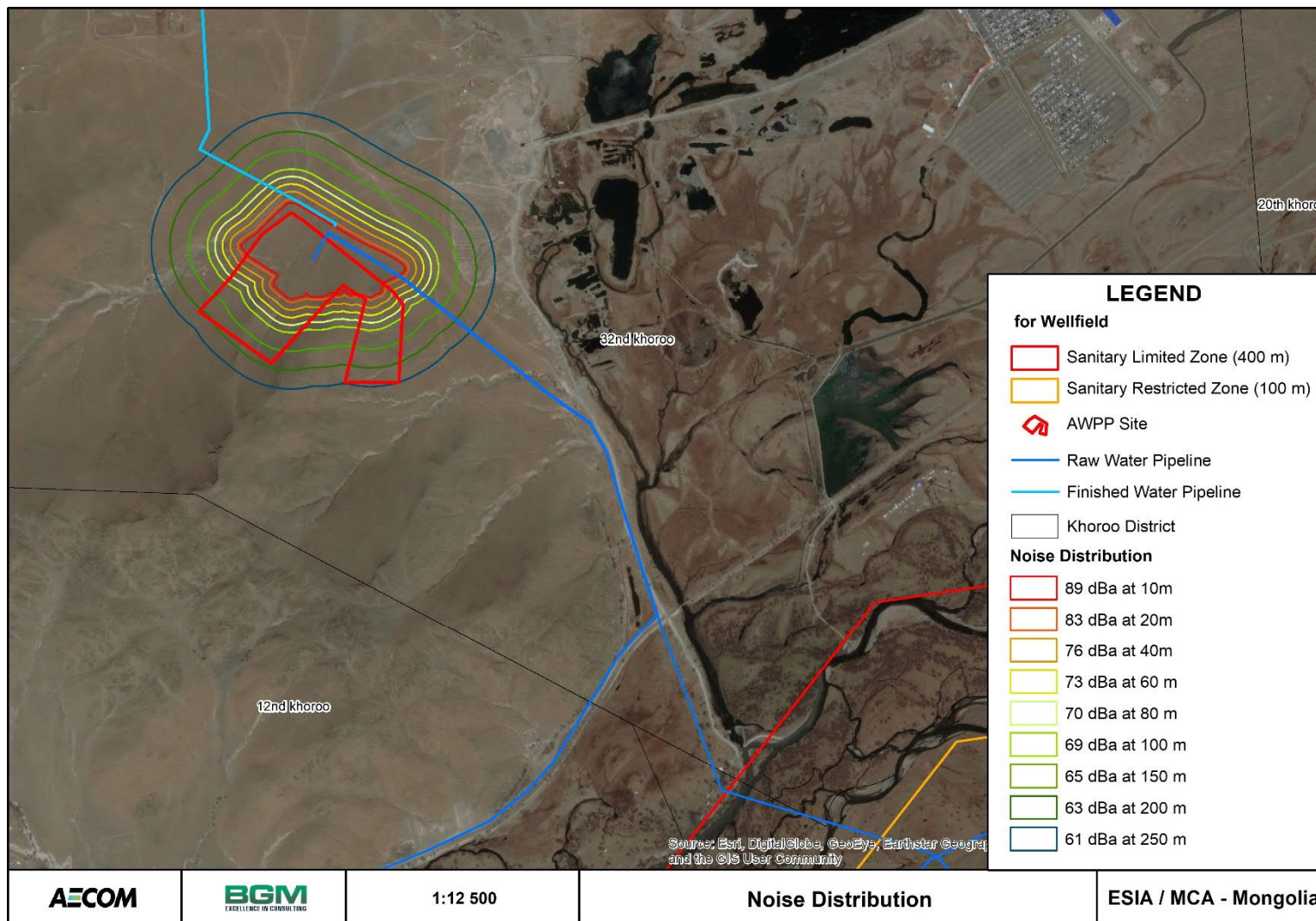


**Figure 7-33 Estimated Noise Propagation due to Construction Work for Access Road to AWPP Site**

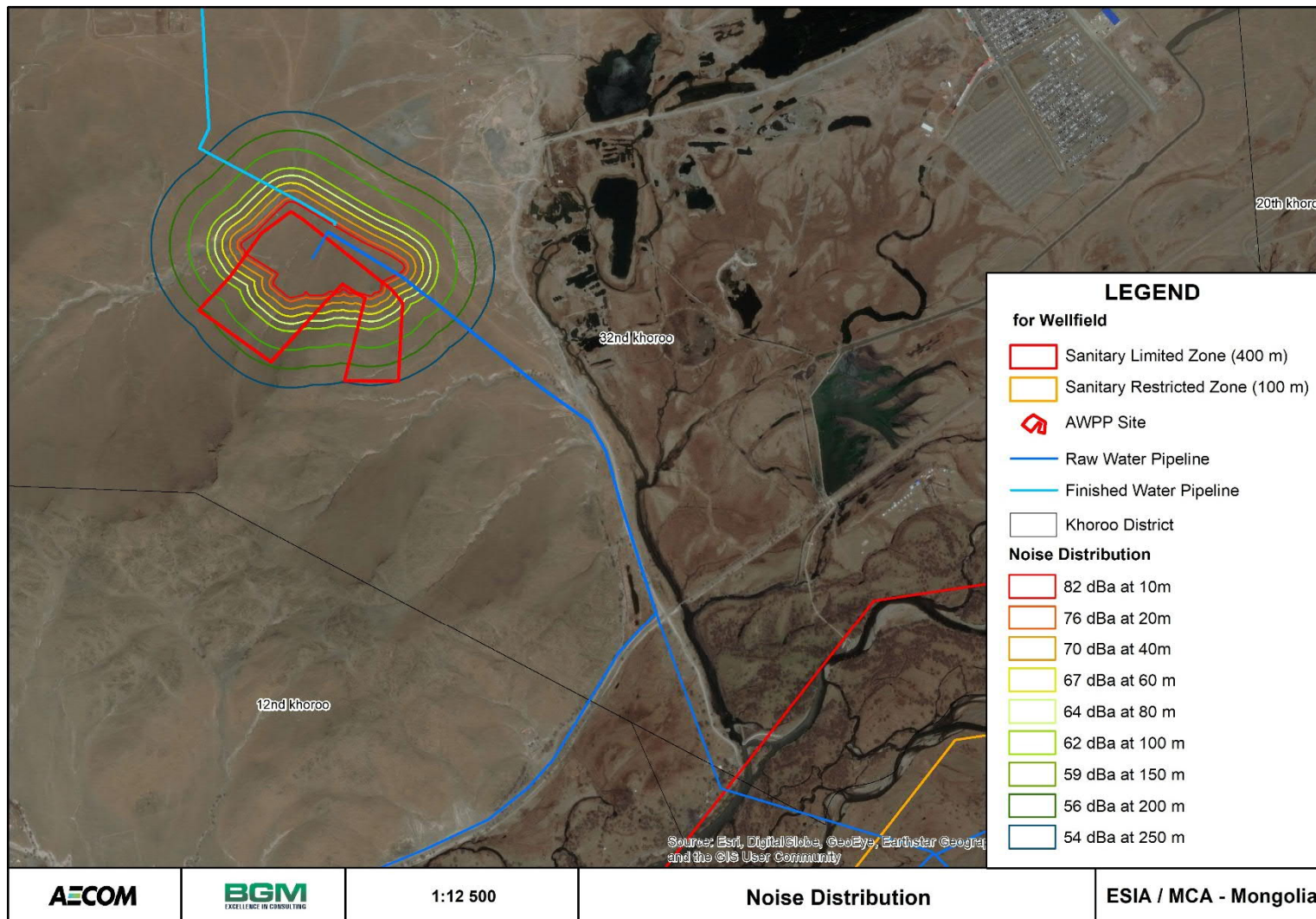




**Figure 7-34 Estimated Noise Propagation due to Construction Work for Access Road to AWPP Site**

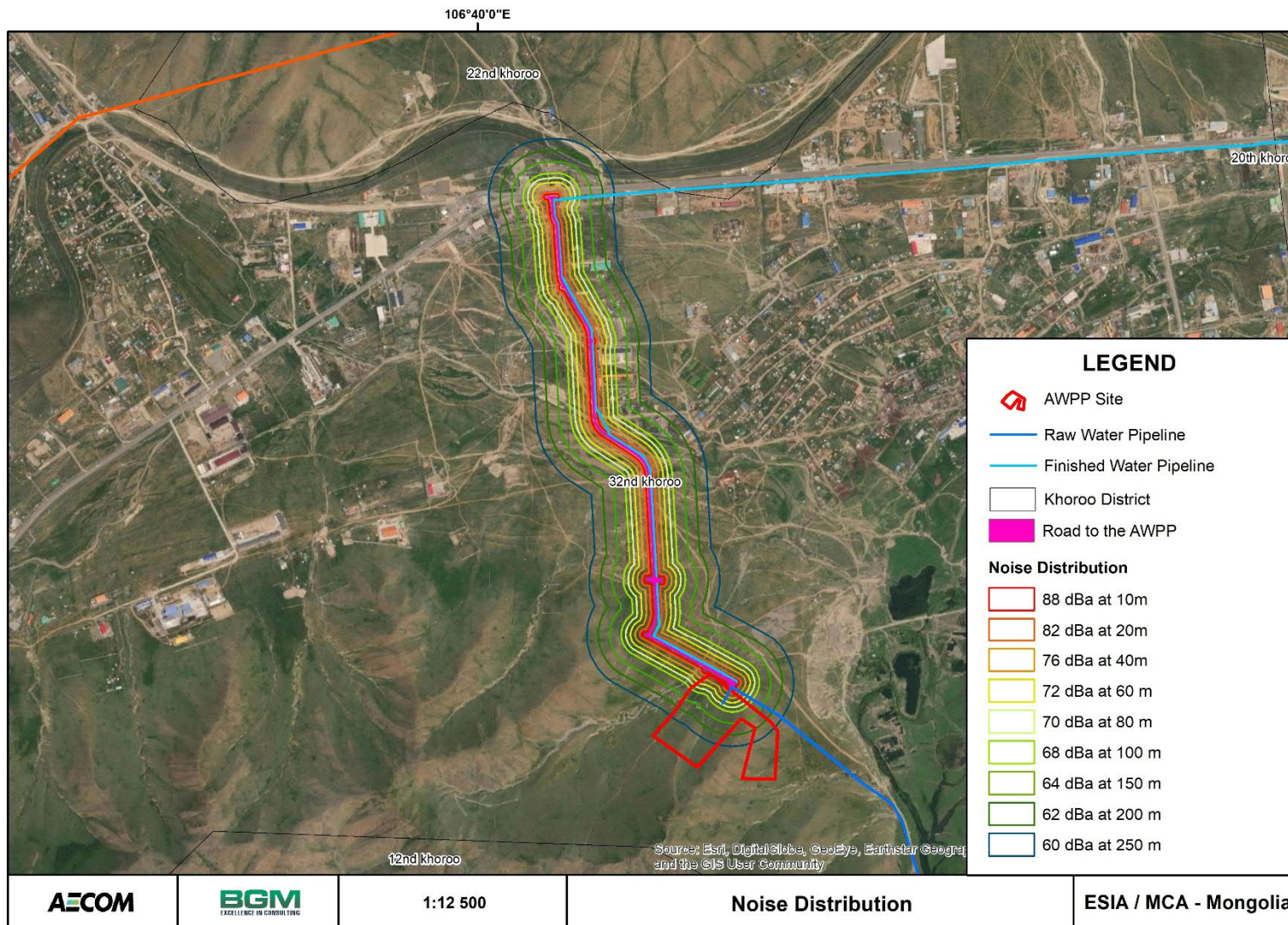


**Figure 7-35 Noise Propagation due to Earthwork at AWPP site**



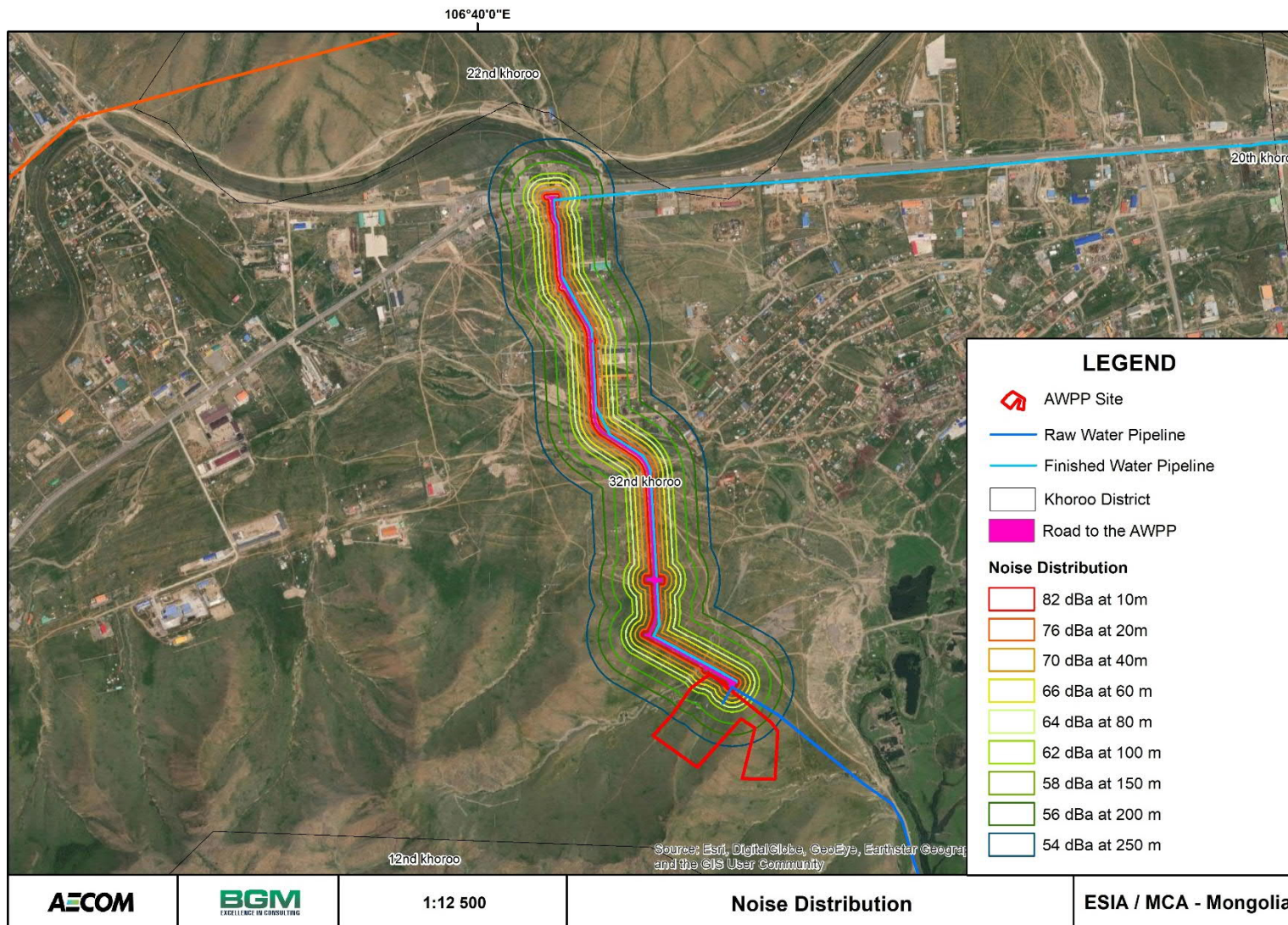
**Figure 7-36 Noise Propagation due to Construction Work at AWPP Site**





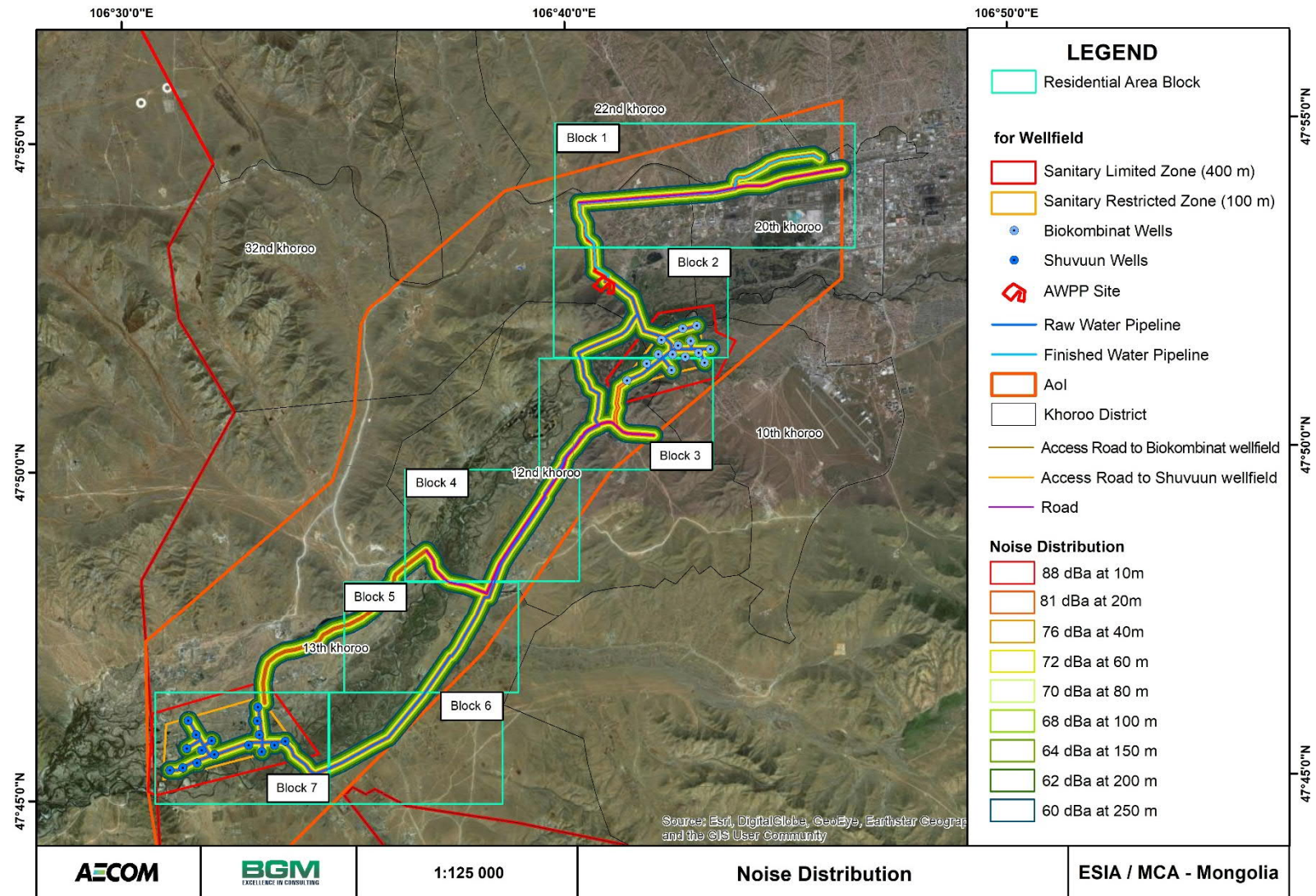
**Figure 7-37 Noise Propagation due to Earthwork of the Access Road to AWPP site**





**Figure 7-38 Noise Propagation due to Construction Work of the Access Road to AWPP site**





**Figure 7-39 Noise Propagation due to Material Transporting Activities**

However, Contractor implementation of best engineering practices for site-specific health and safety plan, hours of operation, hours of construction, safeguarding open excavations, traffic control, erosion control, noise control, cleaning up project site (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01063, 01110, 01568, and 01710), and clearing and grubbing and excavation, separation of excavated material for reuse, trench excavation, reuse and disposal of surplus excavated materials, care and restoration of property and backfilling (as respectively defined in technical specifications, Division 2 Section 02210 and 02230) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
  - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
    - a. MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
    - b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
    - c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
    - d. MNS 4931:2000 Protective means. General requirement, classification.
    - e. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
    - f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
    - g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
    - h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
    - i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
    - j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
    - k. Labor code of Mongolia.
    - l. Law of Mongolia on Toxic Hazardous Chemicals
  - 3) The Health and Safety Plan shall include, but not be limited to the following:
    - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
    - b. Identification of hazards and risks associated with the Project.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Respiratory protection training requirements.
    - e. Levels of protection and selection of equipment procedures.
    - f. Type of medical surveillance program.
    - g. Personal of hygiene requirements and guidelines.
    - h. Zone delineation of the Project site.

- i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
- 4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
- 5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
- 6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.
- Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
  - Section 01046, Control of Work
- Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the

- open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
  - Paragraph 3.05.C - The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.
  - Section 01063, Miscellaneous Requirements
    - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
    - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
    - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
  - Section 01110, Environmental Protection Procedures
    - Paragraph 3.02.A – Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
    - Paragraph 3.07.A – The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.
  - Section 01568, Erosion Control, Sedimentation and Containment of Construction Materials
    - Paragraph 3.01.B – Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.
    - Paragraph 3.01.B – Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.
    - Paragraph 3.02.K – Prevent damage to vegetation adjacent to or outside of construction area limits.
  - Section 01710, Cleaning Up

- Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
  - 6. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
  - 7. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
  - 8. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  - 9. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  - 10. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
    - Paragraph 3.02.A - Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
    - Paragraph 3.02.B - Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
    - Paragraph 3.02.C – Excavate to widths that give suitable room for building structures or laying and jointing piping.
    - Paragraph 3.02.D – Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.



- Paragraph 3.02.E – Excavate to lines and grades indicated in an orderly and continuous program.
- Paragraph 3.02.F – Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- Paragraph 3.02.G – Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- Paragraph 3.02.H - Exercise care to preserve material below and beyond the lines of excavations.
- Paragraph 3.02.I – Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- Paragraph 3.02.J – Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- Paragraph 3.02.K – Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.
- Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
- Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- Paragraph 3.03.C – Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
- Paragraph 3.04.A – When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- Paragraph 3.04.B – When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- Paragraph 3.11.A – Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed
- Paragraph 3.11.B – Surplus excavated material shall not be used in locations where structural backfill is required.
- Paragraph 3.13.A – Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- Paragraph 3.13.B – Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.

- Paragraph 3.13.C – Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- Paragraph 3.13.D – Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- Paragraph 3.13.E – Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.
- Paragraph 3.14.A – Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- Paragraph 3.14.B – Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- Paragraph 3.14.C – Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- Paragraph 3.14.D – Do not use puddling, ponding or flooding as a means of compaction
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- **Noise pollution:** There is also a risk for workers and local communities due to noise increase during the land clearance, earthworks and construction activities of facilities. However, duration of these activities would be short term (i.e. limited to construction period). The spatial extent of impact would be at site scale. Therefore, the magnitude of impact would be moderate for the workers and local communities, while the receptor sensitivity is high due to exposure to noise. This would result in high impact significance

for the construction workers and local communities without the application of best engineering practices. However, Contractor implementation of best engineering practices for the site-specific health and safety plan, hours of operations, hours of construction, traffic control and noise control (as respectively defined in technical specifications, Division 1 Section 01030, 01046, 01063 and 01110) would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low. The Contractor would employ best management practices including but not limited to the following technical specifications:

- o Section 01030, Special Requirements
  - Paragraph 1.04.C – 1) Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
  - 2) Contractor shall be cognizant of the minimum standards norms set forth as follows:
    - a) MNS 4990:2015 Labor Safety. Labor Environment. Hygiene requirements.
    - b) MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
    - c) MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
    - d) MNS 4931:2000 Protective means. General requirement, classification.
    - e) MNS Labor Safety and Sanitary. General Requirements for Industrial operation.
    - f) MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
    - g) BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements.
    - h) BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa.
    - i) BD 12-10-05 Safety guidelines to be followed for construction and installation works.
    - j) MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
    - k) Labor code of Mongolia.
    - l) Law of Mongolia on Toxic Hazardous Chemicals
  - 3) The Health and Safety Plan shall include, but not be limited to the following:
    - a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
    - b. Identification of hazards and risks associated with the Project.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Respiratory protection training requirements.
    - e. Levels of protection and selection of equipment procedures.
    - f. Type of medical surveillance program.
    - g. Personal of hygiene requirements and guidelines.
    - h. Zone delineation of the Project site.
    - i. Site security and entry control procedures.
    - j. Field monitoring of site contaminants.

k. Contingency and emergency procedures.

l. Listing of emergency contacts.

4) The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

5) All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.

6) The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

- Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
  - Section 01046, Control of Work
- Paragraph 3.01.A - Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Section 01063, Miscellaneous Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.

- Section 01110, Environmental Protection Procedures
  - Paragraph 3.07.A – The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.

Assessment of potential impacts on noise during the construction phase is summarized in Table 7-53.



**Table 7-53 Assessment of Noise Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Production well drilling</b>	Release of noise emission	Driller Worker and	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Site-specific health and safety plan, Hours of Construction, Traffic control, Noise control as specified in technical specifications at Division 1 Section 01030, 01046, 01110 and 01063;  Drilling preparation and performance pump testing as specified Technical specifications at Division 2 Section 02672;	Low
<b>Well construction</b>		Construction Worker	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Site-specific health and safety plan, Hours of operation, Erosion control, Traffic control, Noise control and Cleaning up project site as specified in Technical specifications at Division 1 Section 01030, 01046, 01110, 01568, 01063 and 01710;  Clearing and grubbing as specified in Technical specifications at Division 2 Section 02230;	Low
<b>Pipeline installation</b>	Increased noise emissions due to works	Workers and Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Site-specific health and safety plan, Hours of construction, Safeguarding open excavations, Traffic control, Noise control, Erosion control, and Cleaning up project site as specified in technical specifications, Division 1 Section 01030, 01046, 01110, 01568, 01063 and 01710);  Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling best engineering practices as specified in technical specifications at Division 2 Section 02210 and 02230)	Low
<b>Tuul River crossing</b>	Release of noise emission	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High		Low
<b>Construction of AWPP facilities</b>	Noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Site-specific health and safety plan, Backfilling operations following pipe laying, Hours of operation, Erosion control, Hours of construction, Traffic control, Noise control and Safeguarding open excavations and Cleaning up project site as specified in technical specifications at Division 1 Section 01030, 01046, 01110, 01568, 01046, 01063 and 01710;	Low

**Bulk Water Supply Expansion**  
**Environmental and Social Impact Assessment**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
								Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling as specified in technical specifications at Division 2 Section 02210, and 02230;	
<b>Temporary works camp</b>	Release noise emissions	Workers and Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Erosion control, Field office, Visitor center, Temporary perimeter fence, Temporary electrical, Temporary heat, Temporary sanitary conveniences, Site security, and Shelter and protection of materials, and Cleaning up project site as specified in Technical specifications at Division 1 Section, 01110, 01568 and 01500 and 01700;	Low
<b>Land clearance and earthworks</b>	Release noise emissions	Workers and Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Site-specific health and safety plan, Hours of operation, Hours of construction, Safeguarding open excavations, Traffic control, Erosion control, Noise control and Cleaning up project site as specified in technical specifications at Division 1 Section 01030, 01046, 01110, 01568, 01063 and 01710;  Clearing and grubbing and excavation, Separation of excavated material for reuse, Trench excavation, Reuse and disposal of surplus excavated materials, Care and restoration of property and backfilling as specified in technical specifications at Division 2 Section 02210, and 02230;	Low
<b>Noise pollution</b>	noise emissions	Workers and Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Site-specific health and safety plan, Hours of operations, Hours of construction, Traffic control and Noise control as specified in technical specifications, Division 1 Section 01030, 01046, 01063 and 01110;	Low

## 7.9.6 Operation and Maintenance Impacts

- **Groundwater abstraction from wellfields:** Groundwater abstraction from production wells at the two proposed wellfields would not be generated noise impact. Therefore, the magnitude of impact would be negligible for noise impact. This would result in low impact significance for receptors. Furthermore, Operator implementation of the best engineering practices consistent with those implemented during construction, as well as compliance with Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, would avoid or minimize any potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.
- **Maintenance of pipeline:** The earthwork activities for maintenance of the raw and finished water pipelines would not be anticipated to require removal of all soils along pipelines, as compared with the construction phase. Thus, noise emissions would be temporary and limited at site scale. Therefore, the magnitude of impact would be low for workers and local communities, while the receptor sensitivity is high due to exposure to noise emissions. This would result in moderate impact significance for health of workers and local communities without the application of best engineering practices employed. However, Operator implementation of best engineering practices consistent with those implemented during construction, as well as compliance with MNS 5918:2008, MNS 5914 : 2008, MNS 5916 : 2008 and MNS 4585 : 2016, would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to low.
- **Access road:** Access road to proposed two wellfields, AWPP and Monument would be constructed or enhanced during the construction phase. It is important to note that paved road would be used to access to AWPP site during the operation and maintenance phase. Noise emissions would be generated from the vehicles used for transporting operators and workers to and from the site. Despite the potential noise, it would be generally considered to have a low impact. Therefore, the magnitude of impact would be low for the workers and local communities, while the receptor sensitivity is high due to exposure to noise emissions. This would result in moderate impact significance for health of workers and local communities without the best engineering practices employed. However, Operator implementation of best engineering practices consistent with those implemented during construction would avoid or minimize potential adverse environmental impacts, reducing the anticipated residual impact significance to negligible.

Assessment of potential impacts of the noise emissions during the operation and maintenance phase is summarized in Table 7-54.

**Table 7-54 Assessment of Noise Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
					Measures	Overall			
<b>Groundwater abstraction from Wellfield</b>	Not direct release of noise emissions	Local communities	High		<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Long-term <b>Frequency:</b> frequently	negligible	Low	Special and Ordinary Protection and Sanitary Zones of Water Sources, approved by joint decree A-230/127 of 2015, signed by the Minister of Environment, Green Development and Tourism and the Minister of Construction and Urban Development;	Negligible
<b>Maintenance of pipeline</b>	Noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.; MNS 5918:2008-The General Technical Requirements for Vegetation of Eroded Land; MNS 5914 : 2008- Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions; MNS 5916 : 2008- Topsoil stripping and storage during earthworks; MNS 4585:2016	Low
<b>Access road</b>	Release of noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.;	Negligible
<b>Noise pollution</b>	Not direct release of emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Long-term <b>Frequency:</b> Occasionally	Low	Low/Moderate	Operator services, Operator qualifications, Operator profile, owner equipment, facilities and supplies consistent with best engineering practices and management measures implemented during construction.; MNS 4943:2015- Effluent Wastewater Quality Standard; MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals;	Negligible

As shown in Table 7-50, Table 7-53 and Table 7-54, the potential impact of noise emissions in the Aol are likely to arise primarily during construction activities of the raw and finished water pipelines, wellfields, and AWPP facilities.

In addition to this, operations and maintenance activities related to the BWSE project would be limited. Where required, these activities would involve routine inspections, maintenance and monitoring of the production wells, pipelines and AWPP activities.

As a result of the impact assessment of noise emissions due to BWSE project activities, the significance of the residual impacts on workers and local communities would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

## 7.10 Waste

This section presents an assessment of the potential waste generation during BWSE project activities. The potentially applicable Mongolian and IFC regulations include:

- Mongolian Law on Waste, 2017
- Mongolian Law on hazardous and Toxic Chemicals, 2017
- General Requirements for Non-hazardous Waste Categorization, Collection, Transportation, Re-use, Recycling and Disposal (Annex to Order A/443 by the Minister for the Environment and Tourism, 2018)
- Guide for Non-hazardous Waste Disposal Facility Operation (Annex to Order A/445 by the Minister for the Environment and Tourism, 2018)
- Requirements for Hazardous Waste Transportation, Collection, Storage, Recycling, Disposal and Export Activities (Annex to Order A/18 by the Minister for the Environment and Tourism, 2018)
- Waste Coding and Categorization at Waste Sources (Annex to Order A/349 by the Minister for the Environment and Tourism, 2017)
- IFC EHS guidance 1.6: Waste management

Generally, wastes would be categorized into three main types in term of their properties:

- Inert waste (e.g. surplus excavated rock and construction materials)
- Non-hazardous waste (e.g. food waste, glass, plastics, metals-drinking cans and general mixed waste)
- Hazardous waste – (e.g. oil, medical or healthcare waste from first aid activities and batteries)

Hazardous wastes include those identified as potentially harmful to human health or the environment, typically with the potential to lead to long-term contamination. It is likely that the main sources of these wastes would arise during the operation of vehicles, standby power generation and equipment. The following hazardous wastes could be produced as a result of activities during all phases.

The methodology used in this assessment differs from that detailed in Section 3 due to the nature or types of waste generation and handling process. In other words, it would be recognized that impacts from the waste would arise throughout the waste management implementation and therefore the waste generation, collection, storage and transport is focused in this assessment.



Table 7-55 shows a matrix that compares waste type and the applicable handling process, to determine impact magnitude.

**Table 7-55 Ranking of Magnitude of Waste Impacts**

Applicable handlings at the Site	Waste Types		
	Inert	Non-hazardous	Hazardous
<b>Applicable handlings are available with sufficient capacity to manage the quantities of wastes generated.</b>	negligible	negligible	Low
<b>Applicable handlings are available but capacity to accept waste from project may be constrained due to size of facility or distance from site.</b>	Low	Moderate	Moderate
<b>Applicable handlings are unavailable or means of management are uncertain.</b>	Moderate	Moderate	High

The receptor (e.g. workers, local communities, environmental living and non-living components) sensitivity would be assumed to be constant as high. The ranking delivered by the impact magnitude in Table 7-55 also reflects “impact significance”; the definitions of significance detailed in Section 3 are therefore applicable.

### 7.10.1 Impact Assessment of Waste

It should be noted that indirect and secondary waste impacts to living and non-living environmental components due to the BWSE project activities are discussed in Section 7.4, 7.5, 7.6, 7.7 and 7.9.

The waste would be generated by the pre-construction workers operating all identified activities, such as exploratory and test well drilling, geophysical survey, geotechnical, topography and geodesy survey and would be a function of the number of workers. It would be assumed that there will not be temporary working camps. Therefore, waste would only be generated by the workers during the pre-construction phase of the working day.

Workforce would be increased during the construction phase compared to pre-construction phase. In addition to this, temporary working camps could be required during the construction phase. Also temporal waste storage facilities with sufficient capacity would be required.

In comparison to the pre-construction and construction phase of works, it would be anticipated that the operational and maintenance phase of the BWSE project would generate much smaller volumes of waste. During this phase, only some maintenance would be required (e.g. pipeline maintenance). On other words, it would not be expected to have any build-up of scale or need for regular site cleaning and earthworks. It should be noted that the waste management including collection, storage and disposal would be carried out by applicable licensed local contractors and using facilities that are constructed, operated and licensed in accordance with relevant Mongolian regulations. Table 7-56 summarizes the impacts of each waste sources during the BWSE project phases before and after implementation of applicable best engineering practices for site-specific emergency action plan, site-specific hazardous waste management plan, disposal of debris, protection of streams, wetlands and surface water, protection of land resources, protection of air quality, temporary perimeter fence, temporary sanitary conveniences, storage and handling of hazardous materials, and cleaning up project site as defined in technical specifications at Division 1 Section 01030, 01110, 01500, 01610, and 01710 and clearing, grubbing, tree and stump removal, disposal of waste materials, separation of excavated material for reuse, reuse and disposal of surplus excavated materials, clearing and grubbing and, clean-up, and site clean-up as specified technical specifications at Division 2 Section 02100, 02210, 02230 and 02672. The

Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.04.D – 1) Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
  - 2) The Emergency Action Plan shall include, but not be limited to the following:
    - a. Identification of hazards and risks associated with the Project.
    - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Levels of protection and selection of equipment procedures.
    - e. Field monitoring of petroleum products and potential pollutants.
    - f. Contingency and emergency procedures.
    - g. Listing of emergency contacts
  - Paragraph 1.04.E – 1) The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.
  - 2) Certain chemical and physical agents (i.e., asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulatory agencies, the Contractor shall notify the Owner immediately of the nature of the incident.
  - 3) The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
    - a. The location of potential hazards.
    - b. The potential adverse health effects posted by such hazards.
    - c. Proper safe work practices to prevent or reduce potential exposure.
    - d. Proper protective measures and equipment required.
    - e. Proper use of protective equipment.
    - f. Proper response to exposure incidents.
    - g. Proper disposal of hazardous materials.
  - 4) The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:
    - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
    - b. Hearing protection (plugs, muffs, etc.).

- c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).
  - Paragraph 1.21.A – During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
  - Paragraph 1.21.B – Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
  - Paragraph 1.21.C – At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.
- o Section 01110, Environmental Protection Procedures
  - Paragraph 3.03.A – Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
  - Paragraph 3.03.B – The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
  - Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
  - Paragraph 3.03.D – Water being flushed from structures or pipelines after disinfection, with a  $\text{Cl}_2$  residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.
  - Paragraph 3.04.A – Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas shown on the Drawings.
  - Paragraph 3.04.B – Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

- Paragraph 3.04.C – Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- Paragraph 3.04.D – Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.
- Paragraph 3.04.E - All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25 mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
- Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- Paragraph 3.04.G - The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- Paragraph 3.04.H - Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.
- Paragraph 3.04.I - All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.
- Paragraph 3.05.A – Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work

proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

- Section 01500, Temporary Facilities

- Paragraph 2.05. A - Temporary Perimeter Fencing

- a. Temporary perimeter fencing is to be supplied and installed by the General Contractor, to enclose and secure the field offices, while providing screening of construction activities.
    - b. Temporary fence shall be 2.4 meters (8 feet) above grade. All fence panels shall align with adjacent panels along top.
    - c. Fencing metals to be low sheen black finish, 60 mm (2 3/8") galvanized posts with 11 gauge chain link fencing, 41 mm (1 5/8") top and bottom rail. All fencing is to have screening fabric, attached with galvanized metal heavy gauge wire clips, black color.
    - d. Screening fabric shall be knitted polyethylene cloth, with reinforced band and grommets along top and sides for secure anchoring to chain link panels.
    - e. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.

- Paragraph 3.03.A – Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
  - Paragraph 3.03.B – Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.

- Section 01610, Delivery, Storage and Handling

- Paragraph 1.05.C – 1) The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.

- a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:

- Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.

- b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.

- c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.

- d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.



2) Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

○ Section 01710, Cleaning Up

- Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
  1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
  2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
  3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

○ Section 02100, Site Preparation

- Paragraph 3.02.A - Trees.
  1. Preparation of the site shall include the complete removal of all trees within the Limit of Work Line, except in those areas where selective clearing and thinning is required. Any trees within the Limit of Work Line not to be removed shall be protected from damage during clearing and construction operations by barriers or by such other methods as conditions may require. No construction materials or debris shall be stored or stockpiled, or vehicles parked or operated within the limits of the branch spread of the trees to be saved.

2. Clearing operations shall be performed in a manner which will prevent damage by falling trees to trees left standing or to structures under construction, and by methods which will provide for the safety of employees and other persons.
  3. Limited clearing and thinning shall be performed in areas identified on the drawings, as required or as directed by the Engineer. This work will involve the removal of brush, small trees, dead, damaged and/or diseased trees. The Engineer will tag or otherwise mark and designate trees and brush to be saved. Where branches of trees which are to be saved interfere with the work, limbs and branches shall be trimmed off neatly and cleanly close to the bole of the tree or to main branches. Cut surfaces shall be painted with a tree wound paint. Pruning shall be done in accordance with the District Landscaping and Servicing Department liaison and only by persons experienced with this work. The Contractor shall legally dispose of all branches and limbs off site.
  4. All trees, above a four-inch caliper, which are designated to be removed shall become the property of the Contractor to be disposed of by sale or otherwise, provided that such material shall be removed from the property of the Owner before the completion of the site clearance work. The Owner assumes no responsibility for the protection and safekeeping of such materials. The Contractor shall be responsible for all taxes, if any, incurred in the sale of materials.
- Paragraph 3.02.B - Grubbing shall consist of the grubbing up, removal and disposal of all stumps, roots larger than 36 mm (1-1/2 inches) in diameter, and matted root formations from the designated areas. All rocks or boulders near the existing surface grade, which may interfere with planned construction operations, shall be removed and disposed of as surplus/waste material, or used as fill, where specifically permitted by the Engineer.
  - Paragraph 3.02.C - All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings. The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it.
  - Paragraph 3.03.A - All cleared and grubbed materials shall be legally disposed of off-site by the Contractor. Burning of cleared and grubbed materials is not permitted.
  - Paragraph 3.03.B - All waste materials shall be legally disposed of off-site by the Contractor.
- Section 02210, Earth Excavation, Backfill, Fill and Grading
    - Paragraph 3.03.A - Remove only existing pavement that is necessary for prosecution of work.
    - Paragraph 3.03.B - Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
    - Paragraph 3.03.C - Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.
    - Paragraph 3.11.A - Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally

- dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed.
- Paragraph 3.11.B - Surplus excavated material shall not be used in locations where structural backfill is required.
- Section 02230, Site Cleaning
  - Paragraph 3.01.A - Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
  - Paragraph 3.01.B - Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
  - Paragraph 3.01.C - Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
  - Paragraph 3.01.D- Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
  - Paragraph 3.01.E- Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
  - Paragraph 3.01.F- The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
  - Paragraph 3.01.G- Site clearing shall start once the Temporary Site Plan is approved by the Owner.
  - Paragraph 3.01.H- The temporary site plan drawing shall comply with the requirements in MNS 5415.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer.
  - Paragraph 3.11.A – After completion of the Work, remove tools, appliances, surplus materials, temporary drainage, rubbish, and debris incidental to Work. The contractor shall prevent off-site discharge of turbid water, stormwater, and other contaminants. Excavation and vehicular ruts shall be backfilled and dressed to conform with the existing landscape. Utilities, structures, roads, fences, or any other pre-existing item which must be repaired or replaced due to the Contractor's negligence shall be the Contractor's responsibility; repair or replacement shall be accomplished prior to completion of this contract.
  - Paragraph 3.11.B – At the option of the Owner, the Contractor shall abandon existing 273- or 300-mm diameter test wells and 168-mm diameter observation wells (installed in 2019) at the conclusion of the well-construction program. Contractor shall abandon test wells as follows:
    - Contractor shall disinfect the well in sufficient quantity so that a concentration of 50 ppm of chlorine is present throughout the entire length of the well prior to well abandonment.
    - Contractor shall fill the bottom of the well with processed sand (see Transition Pack in Paragraph 2.07, above).

- Contractor shall then cap the processed sand with 9 meters (30 feet) of Well Sealant (see Paragraph 2.08, above) by pumping the sealant through a tremie pipe placed at the top of the backfilled processed sand.

**Table 7-56 Assessment of Waste Potential Impacts during the BWSE project phases**

Description of Waste type	Waste Category	Waste Storage Facility at the Site	Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
Pre-construction phase					
Waste metal and drinks cans	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Health and safety management plan;  Site safety plan; Emergency preparedness plan;	Negligible
Food waste	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Regulation on operational safety during engineering-geological and geotechnical works of construction. General Requirements: CR 12-102-04;  MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals  General Requirements for Non-hazardous Waste Categorization, Collection, Transportation, Re-use, Recycling and Disposal (Annex to Order A/443 by the Minister for the Environment and Tourism, 2018)  Guide for Non-hazardous Waste Disposal Facility Operation (Annex to Order A/445 by the Minister for the Environment and Tourism, 2018)  Requirements for Hazardous Waste Transportation, Collection, Storage, Recycling, Disposal and Export Activities (Annex to Order A/18 by the Minister for the Environment and Tourism, 2018)  Waste Coding and Categorization at Waste Sources (Annex to Order A/349 by the Minister for the Environment and Tourism, 2017)	Negligible
Waste tires from vehicles	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
Waste oil from maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
Oil filters and oily rags due to maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
Potentially infectious waste from clinics and healthcare	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
Used batteries from maintenance of vehicles	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
Waste metal containing oil residues	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
Construction phase					



Description of Waste type	Waste Category	Waste Storage Facility at the Site	Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
<b>Site clearance waste</b>	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Specific emergency action plan, Site-specific hazardous waste management plan, Disposal of debris, Owner Obtained Permits as specified in technical specifications at Division 1 Section 01030;	Low
<b>Surplus concrete and other general mixed construction materials</b>	Inert	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Protection of Streams, Wetlands and Surface Water, Protection of Land Resources, Protection of Air Quality as specified in technical specifications at Division 1 Section 01110;	Low
<b>Waste metal and drinks cans</b>	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
<b>Food waste</b>	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Temporary Perimeter Fence, Temporary Sanitary Conveniences as specified in technical specifications at Division 1 Section 01500;	Negligible
<b>Waste plastic packaging from construction materials</b>	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Storage and Handling of Hazardous Materials as specified Technical specifications at Division 1 Section 01610;	Low
<b>Waste wooden packaging from construction materials</b>	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Final Cleaning, Cleaning Up Project Site as specified Technical specifications at Division 1 Section 01700 and 01710;	Low
<b>Waste glass from construction materials</b>	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Clearing, Grubbing, Tree & Stump Removal and Disposal of Waste Materials as specified Technical specifications at Division 2 Section 02100;	Low
<b>Potentially infectious waste from clinics and healthcare</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Separation of Excavated Material for Reuse, Reuse and Disposal of Surplus Excavated Materials as specified Technical specifications at Division 2 Section 02210;	Negligible
<b>Used batteries from maintenance of vehicles</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
<b>Waste metal containing oil residues</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Clearing and Grubbing and, Clean-Up, and Site clean-Up as specified	Negligible

Description of Waste type	Waste Category	Waste Storage Facility at the Site	Impact Significance (Pre-Best Engineering Practices)	Best Engineering Practices	Residual Impact Significance
				Technical specifications at Division 2 Section 02230 and 02672;	
<b>Operational and Maintenance phase</b>					
<b>Waste metal and drinks cans</b>	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	MNS 6458:2014-The General Requirements for Handling Toxic and Hazardous Chemicals  General Requirements for Non-hazardous Waste Categorization, Collection, Transportation, Re-use, Recycling and Disposal (Annex to Order A/443 by the Minister for the Environment and Tourism, 2018)  Guide for Non-hazardous Waste Disposal Facility Operation (Annex to Order A/445 by the Minister for the Environment and Tourism, 2018)  Requirements for Hazardous Waste Transportation, Collection, Storage, Recycling, Disposal and Export Activities (Annex to Order A/18 by the Minister for the Environment and Tourism, 2018)  Waste Coding and Categorization at Waste Sources (Annex to Order A/349 by the Minister for the Environment and Tourism, 2017)	Negligible
<b>Food waste</b>	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
<b>Waste tires from vehicles</b>	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible		Negligible
<b>Waste oil from maintenance of vehicles and equipment</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
<b>Oil filters and oily rags due to maintenance of vehicles and equipment</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
<b>Potentially infectious waste from clinics and healthcare</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
<b>Used batteries from maintenance of vehicles</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible
<b>Waste metal containing oil residues</b>	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low		Negligible

Table 7-56 shows that the potential impact of waste in the AoI are likely to arise primarily during construction activities of the raw and finished water pipelines, wellfields, and AWPP facilities.

In addition to this, operations and maintenance activities related to the BWSE project would be limited. Where required, these activities would involve routine inspections, maintenance and monitoring of the production wells, pipelines and AWPP activities.

As a result of the impact assessment of waste due to BWSE project activities, the significance of the residual impacts on receptors would be avoided, minimized, or reduced to negligible or low after the successful application of the best engineering practices by Field investigation teams and Contractors.

## 7.11 Social and Gender Impact Assessment

The social and gender impacts of the project are mainly determined by:

- The extent to which the project requires people to move land use, homes and structures and change livelihoods,
- Whether there are opportunities for employment on the project,
- Making that employment fair and acceptable in the workplace and
- Ensuring that employee behavior does not cause conflict or harm.
- Whether gender and social inclusion impacts are addressed adequately
- Impacts on both tangible and intangible culture - temples and the preservation and respect for Songinokhairkhan Mountain, monuments and ovoos - and the archaeological sites in the area of influence on the project.

The requirement for the MCC Policies on Gender and Social Inclusion and Counter-Trafficking in Persons to be positively addressed, adds further areas of the social and gender impact assessment.

The impacts are not only on communities, settlements, household assets and culture but include wider issues such as employment opportunities for men and women, fair and defined conditions of employment and work, human rights, gender equality and counter-trafficking in persons. Some of these impacts are limited to some phases, e.g. resettlement which has to be achieved before construction begins, others are more important during construction and operations of the project, e.g. anti- trafficking in persons. These impacts are listed in Table 7-57 and developed further in this section.

The impacts are grouped under themes according to the project phase that they occur – resettlement, employment opportunities, contractors' terms of employment and management of employee/ worker behavior, cultural heritage preservation, opportunities for business expansion, health benefits and impacts on gender. The Policy on Counter-Trafficking in Persons is examined under Contractor condition of employment and under employee behavior as this policy requires action from both employers and employees. The Policy on Gender is also crosscutting affecting employment opportunities for women, gender stereotyping and inequality and freedom from harassment and trafficking.

**Table 7-57 Assessment of Social Potential Impacts: Pre-construction, Construction, Operation and Maintenance Phases**

Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures		Overall	Impact Significance (Pre-Best Social Practices)	Best Social Practices	Residual Impact Significance
Pre-construction									
Resettlement	Land , housing and structures	Low	Relocation off residences Loss of land plot	Major	Low	Needs good stakeholder engagement, community consultation and full and fair compensation with livelihood restoration to achieve socially acceptable resettlement	Good quality RAP with adequate mitigation measures	Low	
	Loss of livelihoods	Low	Loss of employment Loss of vegetable growing plot Loss of herd grazing Closure or relocation of small businesses						
	Loss of cultural heritage	High	Potential impact on the sacred Mountain Songinokhairkhan	High	High	Avoidance at design stage	Cultural heritage program to protect the site	High	
		Low	Impact on temples	Moderate	Low	Avoidance at design stage	Map cultural heritage	Negligible	
	Disruption to archaeological sites	Major	Complete loss during construction	Moderate	Low	Investigation during design stages	Fence existing sites Protection in all contracts Chance Find procedure	Moderate	
Construction and Operations									
Employment	Opportunities for local unskilled and semi-skilled Labor	Moderate and positive	Opportunities for work	Low	Low	Opportunities for some local employment especially during construction but local expectations will be higher than likely availability  Women tend to be overlooked in favor of male workers and have lower levels of pay and status	Determine interest in employment of affected communities Encourage employment of local workers and encourage 30% women workers in contracts List potential workers and assist construction companies to identify and employ local workers, local	Low	
	Opportunities for socially excluded groups	Moderate and positive		Low	Low			Low	
	Gender Issues in employment Promotion of employment for women Vs	Moderate		Low	Low			Low	



Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Social Practices)	Best Social Practices	Residual Impact Significance
	Discrimination against women						women and any excluded groups	
	Non-local and Foreign workers	Major	Reduces local employment opportunities	High	Moderate	Decrease in jobs for local people	Mandate local employment Assist contractors to employ affected persons and other local people	Moderate
	Worker Camps	Moderate to Major depending on size	Increase potential for social ills Increased disease, prostitution, drugs and gambling	Major	Moderate	Imported Labor cause social difficulties for local communities	Plan camps at least 2 km from local communities Mandate camp location on contracts	Moderate
	Employment contracts – anti trafficking	Major	Potential for unfair or corrupt contracts of employment charging for jobs or low pay and job insecurity – issues contained in the MCC Policy on Counter-Trafficking in Persons	High	Moderate	Inform contractors of expected contract components	Mandate contractual requirements for employment in contractors' contracts Workers to have internal GRM to report employment abuses	Moderate
	Worker behavior	Major	Potential for workers to participate in sex trafficking in the immediate area or longer distance – MCC Policy on Counter-Trafficking in Persons	Moderate	Moderate	Workers are likely to facilitate sex trafficking by transporting or persuading local women to sell sex	Each contractor must have prohibitions in work practices forbidding the transportation of non-workers in company vehicles and include anti trafficking in the worker code of conduct	Moderate

Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Social Practices)	Best Social Practices	Residual Impact Significance
		Major	Increased sexual harassment of women	High	Moderate	Ongoing harassment of women in the workplace and increased harassment of women in the communities against the MCC Policy on Gender and Social Inclusion	Mandate in contracts workers code of conduct Zero tolerance policy for non-compliance  Mandate training as part of tool box talks and training of all staff	Moderate
			Increase in gender-based violence	Moderate	Low	Lack of information and thoughtlessness causes social harm	Mandate training as part of tool box talks and training of all staff	Low
			Increased cultural abuse – defiling temples, disrespect to Songinokhairkhan mountain	Moderate	Low	Uncontrolled and unpunished worker behavior causes social discontent	Mandate in contracts workers code of conduct Zero tolerance policy for non-compliance	Low
<b>Increased worker incomes/ reduced poverty</b>	Employment income	Moderate	Lowered unemployment Better conditions of employment	Low	Low	Potential for very low levels of improvement owing to other social factors	Mandate local employment for local men and women, use community liaison officers to find unemployed and assist to gain jobs	Moderate
<b>Increased opportunities for businesses to support project activities</b>	Business opportunity enhancement	Moderate	Increased opportunities for local businesses to supply the project and workers	Moderate	Moderate	Needs a positive drive to reach out to local businesses	MCA-Mongolia or its representative to run training workshops for local businesses to learn how to bid for contracts Promotion of the brigade concept for local people to supply employment construction labor	Moderate

**Bulk Water Supply Expansion  
Environmental and Social Impact Assessment**

Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Social Practices)	Best Social Practices	Residual Impact Significance
							will have to format two tables Encourage small businesses to set up shops and stalls to sell to workers	
<b>Improved water supply and quality</b>	Improvements to water supply and distribution system in UB	Major	More reliable and wider distribution of clean water	High	High	Improvements to distribution to widen the numbers of people accessing clean water regularly	Link improvements in quality and supply with improved distribution systems	Moderate

### 7.11.1 Pre-Construction Impacts - Resettlement

The resettlement impacts for the project comprise loss of land, owned or used, houses or structures and impacts on livelihoods – crops, livestock, small businesses, jobs etc. gained from the land and location. The project would impact 78 households located in the Area of Influence of the Project in the Khan-Uul district and 81 in the Songinokhairkhan district. Of these only a total of 46 families are affected by relocation of land, housing and structures because of land take for the BWSE project implementation. The detailed impacts and mitigation measures are detailed in the project RAP reports prepared for this project.

The RAP details the laws and policies governing resettlement in Mongolia and adds the International Finance Corporation Performance Standard on Involuntary Resettlement (IFC PS 5) and the MCC Policies to the GoM system for acquisition and compensation into the handling of resettlement for the project. The RAP describes the assessment and valuation process and estimates of compensation and entitlement are defined for each affected person or household. The compensation and entitlement have to comply with IFC PS 5 which also requires that livelihoods lost or damaged must be restored to at least the same level or preferably enhanced. The RAP has specific guidance on implementation and impact monitoring to ensure that negative impacts are mitigated to the best extent.

The RAP incorporates a Livelihoods Restoration Plan to manage the impacts on those losing employment, production and businesses as a result of resettlement. It also includes a Vulnerable People's Plan to assist those unable to adapt effectively to the changes required – these are vulnerable households – in this context, these are women headed households, poor households, those with disabled and elderly members – for whom the loss of assets and opportunities is likely to mean an increase in poverty.

In this analysis resettlement impacts are split into loss of assets, loss of livelihoods, impacts on culture and on archeology.

The resettlement impacts on the households in the area of interest are generally very small - most losing only a small strip of land along the boundary if the plot with the highway and the relocation of two agricultural businesses. The RAP data collection is not yet complete for Songinokhairkhan district but indications are that 46 households are directly but minorly affected in Khan Uul district

The RAP provides for full and fair market value for compensation for loss of assets, entitlement to remove building materials and provides allowances to assist with the move. The sensitivity of affected households to the changes in land holdings, structures and livelihoods is moderate but the low numbers of affected households and the marginal nature of the majority of loss mean that the significance of resettlement in this project is low.

### 7.11.2 Livelihoods

The livelihoods affected by the land take for resettlement refers to:

- loss of grazing land affecting herding households,
- loss of part or all vegetable plots, a tree nursery and
- two small businesses (grocery shops).

Assistance for finding new land and structures and moving assets is mandated in the RAP.

#### 7.11.2.1 Herding

Pasturelands and seasonal settlement are part of the livelihood systems of Mongolian herders. Herders in the project are either khoroo residents with livestock grazed locally or herders that

move to the project area in the summer to graze their livestock, ignoring the ban on traditional herding in the city as per Resolution No. 85 (2015). Moving pastures and seasonal settlement are part of the mobility pattern that herders keep season after season. Pastureland is an essential component of the herders' livelihood system. A loss of pastureland impacts on grazing opportunities for herders, a possible decrease in dairy and meat production, and thus an eventual reduction in family income.

The implementation of the BWSE project will impact on pastureland located in the vicinity of the Shuvuun wellfield site – livestock is not permitted in the 10<sup>th</sup> khoroo of KhUD where Biokombinat Wellfield is proposed. Some existing grazing areas are located inside the area that would be enclosed in the wellfield fence and no longer would be available for livestock. Grazing will be prohibited in the SRZ 100 meters around the wellfields with the GoM change in land designation for the project. Of the 498 hectares of land proposed for SRZ, it is estimated that 210 hectares are potentially good grazing areas – as noted in Section 6.1.7.7, 288 hectares of the future SRZ at Shuvuun are impacted by mining operation. Grazing in areas outside of the future SRZ, will be disrupted during construction along pipeline installation corridors but is limited to relatively small area.

Loss of grazing land is treated as a temporary economic loss that could be compensated for in the RAP but the need is for replacement grazing not financial compensation. No data was gathered on herder's livelihoods owing to the difficulties of surveying during the COVID restrictions so the extent of impact cannot be estimated. Further work will have to be undertaken in the run up to construction and grazing loss to allow negotiations with herders and the community on winter and summer grazing needs. The RWP RAP has an allocation of a 10% contingency for livelihoods restoration for herders in the event that investigations confirm action is necessary. The research should be commissioned by MCA-Mongolia and contracted to a suitable, local NGO or consultancy.

Inaccessibility of pasturelands and loss of seasonal settlements would seriously impact on herders' livelihood system and the survival ability of the livestock. Such occurrences could undermine a household's economy, therefore community discussions including khoroo officials need to occur to prevent impoverishment of the herder households whilst protecting other land owners and uses from incursion by hungry animals. Impact on herders is moderate after community negotiation.

Independently of the BWSE, there has been an ongoing effort by the GoM to move mining operations from the Tuul River area and rehabilitate the mined areas. In the 13<sup>th</sup> khoroo there are indicatively 865 hectares of land that has had mining licenses revoked since 2017. Though outside of its responsibility, the MCA-Mongolia has been lobbied the GoM to continue with the program and facilitated meetings between key players in various government and municipality departments. Once the rehabilitation process has been implemented there would be an estimated increase of 365 hectares of grazing land outside the SRZ.

### **7.11.2.2 Direct Employment Losses**

In the project area of influence, there are few affected companies and small business that offer employment but it is not expected that these will be permanently impacted and need to relocate. Therefore, it is expected that existing employees will remain at the businesses and it is not likely that this type of employment will be lost by affected persons. Impact is therefore negligible.

### **7.11.2.3 Small Businesses and Entrepreneurs**

There are only two small businesses required to relocate as a result of the land take. These two businesses will be supported by the RAP process to relocate and reestablish their businesses. The project offers positive opportunities for expanding sales of vegetables and grocery items from these local businesses and impact is considered negligible but fully supported by the RAP



### 7.11.3 Cultural Heritage Resources and Archaeology

Mongolia has a rich cultural heritage preserved under both tangible and intangible formats. Cultural resources allow citizens not only to learn about their heritage but also to constitute a memory that is important in the definition of cultural identity. Mongolia seeks to preserve its landscape and protected areas through regulation of the relation between the people and their natural environment. The Mongolian Government has legislature and policies on protected areas and the Law on Protection of Cultural Heritage (2014) seeks to preserve the cultural memory of the Mongolian people. The BWSE must ensure compliance with IFC Performance Standard 8, Cultural Heritage.

The BWSE project will be implemented in an area that includes the land at the foot of the Songinokhairkhan sacred mountain. The Songinokhairkhan Uul is located to the west of UB, and is one of the four sacred mountains of Ulaanbaatar. The sacred mountain is the location of the Monument to Terror Victims, which commemorates the execution in 1937 of the first group of political prisoners, in this instance monks, among the victims of purges that culminated in the second half of the 1930s. Further uphill is an ovoo, or magnificent shrine, which is constructed of stones and tree branches, decorated with colorful prayer flags and silk. The ovoo is symbolic of a deity in Mongolian shamanism, recognizes the sacredness of Songinokhairkhan Mountain, and is a site for worship and ceremonies. The actual project site does not impinge on any cultural heritage site, extensive consideration has been taken to avoid any such impacts.

The mountain is the focus of active worship for the population of UB and beyond and considered the dwelling place of the mountain's spirits. Local authorities and residents would like to maintain continuity of access to and activity at the sacred mountain. The mountain has important religious significance to Buddhists and therefore must be protected from disrespect and encroachment. The project area has 18 temples – all of which have been avoided by designing the project to avoid them.

The area has a rich archaeological heritage with a number of important archaeological burial areas located over the project area. These have been excavated and preserved and need protection in both construction and operational phases by fencing in to protect against vehicular damage. It is entirely likely that there are more sites as yet unidentified – these will be protected by the inclusion of a chance finds procedure in all construction contracts that is compliant with the Law on Protection of Cultural Heritage (2014). The impact sensitivity and significance of infringements is high.

The project has been designed to avoid encroachment upon the mountain's environment and population of the endangered Mongolian marmot as far as possible, but further protection in the construction and operations and maintenance phases is needed to ensure contractors do not violate the protected area or impinge on other areas of cultural significance such as temples, graves, cremation sites and religious artefacts. The impact sensitivity and significance of infringements is high.

Mitigation of these impacts requires raising awareness of the value and respect required of cultural heritage locations and artefacts and enforcing appropriate behavior in the construction workforce, especially if these are foreign labor. This is managed by requiring good behaviors and practices of both contractors and workers which are written into the Contracts and monitored by the SST.

Contractors will be required to add respect for cultural and historical monuments into the Workers Code of Conduct and to include these in toolbox talks and other training programs. Contractors will be required to have zero tolerance of employee abuses of cultural heritage and full responsibility for restitution of abuse.

Prevention of disturbance of the sacred mountain is very important to the maintenance of religious traditions of Mongolia. The people who regularly participate in the religious activities maintain a particular identity while nourishing a strong spiritual life. People come from across the country to participate in the religious traditions at the sacred mountain. The restoration of mountain accessibility allows the continuity of a tradition and prevention of encroachment preserves the respect for the Mountain whilst maintaining access to the Monument and to the ovoo. The design of the AWPP and access roads has been undertaken to respect the environment and allow access to cultural sites.

The BWSE project will include:

- A chance find procedure to manage new discoveries mandated in all contracts with the requirement to include training on cultural heritage issues in tool box talks and the usual training program.
- Liaise with religious and spiritual leaders and communities to fence all known archaeological sites and features to prevent construction damage and facilitate access by the community managed by the SST.
- Mandate training in all contracts for all workers on cultural awareness and respect for cultural heritage.

## 7.11.4 Construction Phase - Employment

In general, formal employment offers better and fairer employment conditions than much of the informal sector in Mongolia where informal employment conditions are often exploitative, insecure, less safe, liable to forced overtime and low rates of pay.

Construction projects usually expand job opportunities in the project area but it is not anticipated that the BWSE will generate large numbers of long-term employment opportunities in the construction or operation and maintenance phases. Estimates of the number of construction jobs is not yet available but jobs in the operation phase are estimated to be minimal at less than 20. This section looks at the groups of local people looking for employment from the project.

The project requires that all contractors implement a Human Resources Policy that is compliant with IFC Performance Standard 2 *Labor and Working Conditions*, as well as the extensive body of Mongolian labor law. The Labor Management Plan proposed in Section 11 incorporates all aspects of the Mongolian labor laws. IFC Performance Standard 2 is applicable to main contractors, suppliers, and third parties.

### 7.11.4.1 Employment Opportunities for Local Workers

The construction phase of the BWSE does present a low level of employment opportunity in unskilled and semi-skilled jobs for the local communities and by extension to residents of UB and those of Khan Uul and Songinokhairkhan districts in particular. These jobs will not automatically be awarded to local people unless contractors can be required to employ local people over others.

Construction contractors usually prefer to bring in their own work force which is trained and used to the work rather than take on new workers at each location. This disadvantages local people. The pattern is worse with international contractors, e.g. in this case China, who prefer to bring their own workers from China.

According to the 2019 Labor Force Survey, the labor force participation rate is 60.5 percent nationwide, 56.8 percent in urban areas, and 71.0 percent in rural areas. The labor force participation rate in urban areas is 14.2 percentage points lower than in rural areas (11.0 percentage points for men and 16.2 percentage points for women). At the national level, Labor

force rate for women is 14.9 percentage points lower than for men (15.9 percentage points in urban areas and 10.7 percentage points in rural areas).

Nationally by gender, the majority of male employed (56.5-86.5 percent) are in transport and storage, construction, mining and quarrying, public administration and defense, compulsory social security, agriculture, forestry, fishing, and hunting. However, more than 50 percent women employed are in human health and social welfare activities, education, manufacturing, wholesale and retail trade, and repair of motor vehicles and motorcycles (2019, Labor Force Survey). In the construction sector, 17.4 percent of workers are women and 82.6 percent are men nationally. Women in the construction sector comprise 3.2 percent of the female work force. For the total employed, 16.7 thousand persons, or 1.5 percent, are working more than one job. Of these, 9.9 thousand (59.3 percent) are men and 6.8 thousand (40.7 percent) are women. At the national level, the average working hours per week by employed for their main job is 51 hours, in terms of gender, 54 hours for men and 48 hours for women.

According to the Labor Force Survey, there were 375.3 thousand persons, or 12.1 percent, aged 15-24, of which 194.7 thousand persons, or 51.9 percent, were men and 180.6 thousand persons, or 48.1 percent, were women. Of these young persons, 118.2 thousand persons, or 31.5 percent, were in the labor force and 257.1 thousand persons, or 68.5 percent, were outside the labor force. There are 88.3 thousand, or 74.7 percent, of the labor force who are employed and 29.9 thousand, or 25.3 percent, are unemployed.

The overall conclusion from the Labor Force Survey analysis is that there are sufficient construction skilled, semi-skilled and unskilled male and experienced female workers available in the project area to provide employees for the project. It also shows the demand for employment in the youth sector and confirms that local people need jobs. Workers are available in the construction industry all year round.

There will be competition for local people from Mongolian labor from outside districts and from UB. Temporary workers move around Mongolia looking for job opportunities. Population movement around a major project such as the BWSE should be expected and would create additional competition for jobs.

With unemployment standing at 6.6 percent nationally (NSO, 2020) and 11 percent in the survey area, employment opportunities are welcomed by local communities even for short-term construction jobs. Many households in the area are poor with a monthly income per capita below the poverty line of 230,000 MNT. These households tend to have fewer members with paid employment (30.6 percent) and higher levels of unemployment (47 percent) than wealthier households. In poor women headed households in the project area, this trend is even greater with 65 percent unemployment, rising to 80 percent in female headed households in the resettlement area. Sensitivity of employment for local populations is high and significance is high despite the low level of opportunity. The impact of employment opportunities is low.

The best outcome for the affected communities would be for a requirement for contractors to use as high a proportion of local labor in unskilled and semi-skilled categories as possible and to limit or refuse foreign labor as far as practical. Experience on other major construction projects has shown that this can be successfully achieved through support by the SST. The SST and community liaison officers will supervise the gathering of lists of persons interested in working on the construction projects. These lists will be shared with Contractors for selecting candidates.

The lists will prioritize local men and women above residents from neighboring khoroos, UB city and elsewhere in Mongolia or internationally. This measure has to fit with a separate MCC contract provision which prohibits restrictions on employment by nationality.

#### 7.11.4.1.1 Local Construction Employment Background

Mongolia has a history of small and medium businesses providing labor in the construction industry called Brigades. The “Switch off Air Pollution” (SOAP) research project report published in 2019 by the Green Initiative – Future technology NGO, UB, is an investigation into the activities of brigades in construction 2018-2022.

The report describes how until the 1990s, the workers with construction qualifications could rely on employment in a single construction organization. The central organization was able to deploy their staff into different brigades based on their occupations and were able to work together to complete a construction. Post-independence, workers can still form brigades but the legality of the brigade, the conditions of contract and the legal status of the brigade means poorer employment conditions.

According to the survey, brigade workers have been working with or without contracts, but may not be paid on time or at all. Failure to be paid is a frequent hazard. This is cited to be caused by poor performance or failure to have a strong contractual arrangement with clients.

The Brigades can be formally registered or not registered, most do not pay taxes - social insurance, health insurance, accident prevention insurance, and income taxes. Of the brigades involved in the SOAP study, 36.2 percent of companies had specialized LLC licenses in construction, 14.8 percent of them didn't have specialized LLC licenses in construction but were formal companies, 43.3 percent were unlicensed brigades, and 8.7 percent of brigade had unknown status. Most of the leaders in the brigades (83.1 percent) are men. The brigades are usually formed of 3-6 people who if necessary, can hire additional workers. Brigades work mostly from March to December but can operate throughout the year. 44 Construction brigades exist in Songinokhairkhan district, 36 are in Khan-Uul district.

The BWSE project offers a major opportunity to improve local construction employment opportunities by working with the Brigades to enable them to work efficiently with Contractors to maintain employment benefit in the affected areas.

Given the reported disparity in capacity to conform to the Law of Labor and others and the likely poor standards of compliance to IFC PS 2 within these organizations, concerted efforts to bring brigades up to standard to work on the project comprises a defined sub-project in its own right. This is discussed in Section 11.

Keeping employment local has many benefits:

- Local people get work and income, health and nutrition may improve
- Local unemployment will drop
- Poverty will be alleviated in the short term for some households
- Long term benefits accrue from training in entrepreneurship, team building, contract management, health and safety and gender issues and anti-trafficking
- No worker camps, reductions in social ills, no cultural conflicts
- Reduction in Anti-trafficking in employment

The risks are:

- Brigades will require time and effort to build up the capacity needed to get them able to work effectively at the required technical standard
- Brigade cultural values and attitudes to work may need training and supervision at the outset

- Brigades will need support to enable them to work as subcontractors with the appropriate training as required for contractors
- Brigades will require support to understand and implement the codes of conduct, plans and policies required of sub-contractors

#### **7.11.4.2 Social Exclusion and Employment**

Social exclusion in the project area focuses more on the length of time a resident has been in the area and vulnerability rather than on tribal, ethnic or language demarcation. As a result, there are no Indigenous groups affected by the project requiring additional protection that would trigger IFC PS 7 on Indigenous people.

The residents of Khan-Uul and Songinokhairkhan districts are already socially and economically marginalized in relation to the residents of central UB. Most are immigrant households from elsewhere in Mongolia looking for economic opportunities to improve their lives. These incoming households have to reside on the urban periphery as they cannot afford the rents to live in the center and have to take whatever employment is possible. These workers are more likely to work in the informal economy with low rates of pay and exploitative conditions.

They are most frequently poor with monthly incomes below the Minimum Subsistence Level of 230,000 MNT per capita. Poor families rely on Government allowances to boost income to survival levels. This has important implications for attempts to enhance livelihoods in households affected by resettlement and who will need distinct additional livelihood interventions to prevent increasing poverty through the Vulnerable People's Plan. A project that offers opportunities for work for poorer households would enable better living conditions for poor and marginalized households.

Vulnerable households are those with incomes below the MSL of 230,000 per capita per month, households with women heads, the elderly and disabled members – all of which combine as multi-faceted poverty. Disability was found in 2 percent of surveyed households. Nationally, the 2019 Labor Force Survey (NSO, 2020) found 83.3 percent of the total working age population (aged 15 and over) do not have any disability problems, 9.8 percent had mild disabilities, 6.3 percent had severe difficulties, and 0.6 percent were unable to work at all due to disabilities.

The project should enable disabled adults to work where qualified. Obstacles to the employment of disabled adults are usually physical and require attention to be paid during building design to provide level access for those using crutches or wheelchairs, alternatives to stairs, toilet facilities to be designed for wheelchair access, doors and corridors to accommodate wheelchair use.

#### **7.11.4.3 Employment for Women**

Gender equality in employment is a fundamental right guaranteed by the Constitution (1992 Constitution). However, according to the World Bank (2018), Mongolia ranks 53<sup>rd</sup> out of 159 countries in gender inequality globally. The local situation relates to the national effort to promote gender equality as outlined in the Constitution of Mongolia (1992, article 16), which guarantees equal rights for men and women in the social, political, cultural, economic life and family relations. The law on Promotion of Gender Equality was passed in 2011 to emphasize the obligations of public organizations to protect citizens against gender-based discrimination.

The gender ideology prevalent in the community in the traditional culture of Mongolia is that the man stands as the household head, and the woman is in charge of the domestic domain. The conventional gender ideology sets the man as the principal breadwinner, which transpires in the wage economy as the privilege of the men to work, earn a living, and sustain the family. Such gender ideology offers more economic opportunities to men than women translating into men yielding substantial economic power compared to their female partners.



With the economic crisis of the 1990s, many Mongolian men had a hard time finding work, and women have since taken upon themselves the responsibility of locating the necessary resources to sustain their households. Women work in both the formal and informal economy and take care of their traditional responsibilities in the home. In the project area, most women work in the informal sector. The socio-economic survey shows that project affected women have fewer income earning opportunities than men but similar rates of unemployment. Women are most often employed in the formal sector with a few having small businesses. In the project area of influence, these businesses are usually beauty/ hairdressing activities, small grocery shops, vegetable sellers etc. The Mongolia labor market offers limited opportunities for employment for women (World Bank 2018).

Mongolia has an increasing number of women heads of the households and women were integrated into the workforce during the socialist era. However, women and men now face different obstacles in the job market based on their gender and there is a gender gap in income (Mongolia Gender assessment ADB 2005, World Bank Perceptions of Precariousness 2018).

Women's incomes in the socio-economic survey for this project were only 69 percent of men's and that opportunities for employment were offered in fewer economic sectors. Per capita monthly income in women headed households in the area of influence is 241,880 MNT, only 12,000 MNT above the official poverty level of 230,000 MNT (USD 82). The per capita figure for all households is 351,389 MNT which implies a much higher average for male headed households. The need is to create opportunity for women, particularly those heading households, to find employment in whatever sector.

Mongolian women contribute to the labor market, including in the construction but opportunities for women in the construction sector are very low and there is considerable prejudice against women's employment in this sector. Women are subject to gender-based employment discrimination not only in terms of the wage gap, but also in job opportunities where employers discriminate against women applicants, and inequality of chances of promotion and opportunities. Such practices reinforce gender-based discrimination and enables sexual harassment at the workplace.

The Government of Mongolia has set closing gender inequality and empowering women as one of the country's major human development goals (Mongolia Millennium Development Goal 2020, Vision 2050). Women in Mongolia face both cultural constraints as well as lack of support to advance their participation in the country's development (World Bank 2018). Nevertheless, the country has made progress in developing a legal and policy framework to protect women and advance gender equality.

The project will require all contractors to treat male and female employees and disabled employees equally and fairly in employment opportunities and conditions of employment and to provide protection for all employees from abuse. Prohibition of such behavior will form part of the Worker Code of Conduct. Training on all gender equity issues is required to be provided by contractors for their workforce. This training can be hired in from organizations such as the Center for Gender Equality in UB focusing on gender issues. Access and toilet/ washing facilities must be provided for men and women separately.

Women need to be able to access employment in the same ways as men with equal pay for equal work and to be able to apply for jobs in the same way in all sectors of the economy. The MCC Gender and Social Inclusion policy proposes a 30 percent voluntary target for women to be employed in MCC funded construction projects. This provision will be included in the standard contracting documents and facilitated and monitored by the SST and Community Liaison Officers. The sensitivity and significance of women's employment is moderate and the impact positive.

The best outcome for all sections of the affected communities would be for a requirement for contractors to use as high a proportion of local labor in unskilled and semi-skilled categories as possible with a 30 percent allocation for women and to limit or refuse foreign labor as far as practical. This will be facilitated through the SST and community liaison officers who will inform communities of employment opportunities through the project communication plan and then supervise the gathering of lists of persons interested in working on the construction projects through the work of the Community Liaison Officers. The information will be shared with District Labor Offices and included in official employment notifications. These lists will be shared with Contractors for selecting candidates. This has been a successful strategy elsewhere.

The lists will prioritize local men and women above residents from neighboring khoroos, UB city and elsewhere in Mongolia. This process has been successful in other MCC projects in promoting local employment. This measure has to fit with a separate MCC contract provision which prohibits restrictions on employment by nationality.

Alternatively, the project can develop a sub-project to work with and develop the capacity of Brigade members to work as construction groups, as subcontractors to Contractors or as employees. The impact of employing local labor is high, additional support to Brigade working would accrue even greater project benefits.

The SST will liaise with local offices of the Ministry of Labor and Social Protection, as well as district and city authorities, to ensure employment vacancies are publicized locally and that the recruitment process complies with the Law on Labor and its provisions. The work force estimates are not yet available for analysis at present.

#### **7.11.4.4 Child Labor**

Child labor is common in the construction sector of Mongolia (ILO 2018). In 2013, NSO and the ILO (2013: 15) conducted a survey according to which 15.9 percent of surveyed children (93,968 children aged 5-17 years) participated in economic activities, of which 54.1 percent were boys and 45.9 percent were girls.

The NSO ILO survey found:

- 16.8 percent of working children were aged between 5 and 9 years,
- 14.5 percent were aged between 10 and 11 years,
- 30.8 percent were aged between 12 and 14 years, and
- 35.9 percent were in 15-17 years age group.
- Out of ten working children, eight lived in rural areas and two lived in urban areas.
- One out of ten working children lived in households with a monthly income of 140,000-200,000 MNT,
- four out of ten working children lived in households with a monthly income of 200,000-400,000 MNT

The Mongolian Labor Law and the Ministry of Labor and Social protection protect against hiring children in the construction sector and protect children from work in hazardous activities. No child under 18 is allowed to work in the construction industry.

The incidence of child labor reported in the socioeconomic baseline survey was high, reflecting the high numbers of poor households in the survey area (49 out of 159 households have incomes below the MSL). Child labor was only reported in poorer households that need to gain income from all sources and household members. 41 out of 49 poor households classified as poor, report sending children to work. There was no real difference in the incidence of child labor reported between MHH and FHH or between the two project areas.

Given the poverty situation in the project area, the potential exists for households to want to send children to work at the construction site to supplement household income. Additionally, construction companies might attempt to hire children to reduce costs. Child labor is against human rights and poverty remains the main cause of child labor.

Low income households often supplement their income through child labor. However, children engaged in labor will miss school, perform poorly and have reduced life chances through lower educational attainment. Often the health of the child is affected and growth stunted. Incidents of child labor in the construction sector in Mongolia exist. Further, because of their age, children in the labor force are frequently subject to unfair treatment, including unfair wages, and unsuitable working conditions, and working hours. The Mongolian Labor Law sets the working age to 16 years old while prohibiting any child engagement in hazardous work and activities. The BWSE expects contractors to respect the Mongolian Labor Law and prefer to mandate workers to be aged 18 years or more on site because of the hazardous nature of the work.

The conditions of contract for all construction will prohibit under-age employment and will require the contractor to develop and implement clear anti-child labor policies with zero tolerance. The Health and Safety Team, established by MCA-Mongolia or its representative, will periodically monitor contractor compliance, examining all worker documents and checking identities. Contracts will specify penalties for non-compliance. Given the poverty situation in the project area, families may be tempted to send their children work at the construction site to supplement household income. At the same time, construction companies might be tempted to hire children and thus benefit from cheap labor. Impact is therefore negative with sensitivity moderate and significance high.

#### **7.11.4.5 Employment of Foreign Labor**

The construction sector in Mongolia hires both national and foreign workers. The Mongolian Labor Law (1999) requires companies to hire Mongolian workers in all job positions as long as they have the required skills. If contractors import labor from outside the country, employment equity, as required by the Mongolian Labor Law, must apply. By contrast, MCC contractual requirements require no restrictions on who can tender for the work or be employed.

The Mongolia labor law allows any legally established company to hire foreign workers and protects the rights of foreign workers. Foreign labor groups are potentially more vulnerable to unequal and exploitative conditions of employment as they are isolated from their own communities, are far from home and can be forced to work unfairly thus at risk of trafficking in persons. These risks are examined in the Section 7.11.6. The risks of importing foreign labor focus mostly on health and community welfare and are reviewed in Section 7.11.12. In brief, foreign labor makes no contribution to income earning and relief of poverty in the local area, which is combined with increased social ills, such as crime, alcohol, illegal drug taking, gambling and prostitution with impacts on community health from increased prostitution.

Permitting the use of imported labor will divert possible employment benefits for local communities and promote increased social tensions in the community. The presence of foreign/temporary workers in the community offers increased risks to public health through imported disease and increases in social ills, including HIV/AIDS, drug taking, gambling, alcohol, prostitution, and harassment of women particularly where they are housed in worker's camps. The potential for increased disease and social nuisance is high.

Project management has to take into account the social stereotypes and conflicting relationships between foreign workers (e.g., usually Chinese workers) and the local community to avoid community conflicts, harassment, and discrimination. The employment of foreign workers must follow the Mongolian labor law and international guidelines.

Contractors must demonstrate that their conditions of contract comply with the Law on Labor on fair employment conditions and lack of discrimination and thus do not amount to trafficking in persons in employment conditions. Imported labor are at greater risk of unfair and exploitative conditions of contract as they are isolated from being able to leave and can be compelled to poor working management. The contractor shall commission and schedule training for employees on cultural and behavioral requirements, emphasizing zero tolerance for non-compliance especially where behavior causes conflict with local communities. Both resident and temporary workers shall have the same labor regulations and conditions.

Contractors will be required to undertake cultural sensitivity training of all its workers particularly of foreign workers. The aim is to ensure that workers do not alienate local communities through disrespect of cultural monuments, or insensitive behavior which creates conflict.

In addition, contractors must draw up a code of conduct which they sign with the employee. This will state the expected behaviors on and off site. The code of conduct covers many social impacts and is presented in section 11. The contractor is required to have a zero-tolerance level with instant dismissal for serious infringements as defined and agreed.

Overall, the importation of foreign labor has a negative impact on the project and should be avoided by fostering local employment.

### **7.11.5 Temporary Work Camps**

In cases of foreign and temporary Mongolian workers from outside the area of influence, temporary workers camps must be offered to provide adequate living conditions without discrimination. Workers' camps should follow clear health and safety guidelines in terms of health (infectious diseases and Covid-19) and safety.

During construction, the BWSE project are likely to set up workers' camps. These must be located at least 2 kilometers from community centers and have sufficient and to standard health and safety facilities. Work camps have to have water supply and sanitation facilities that do not damage the environment and meet environmental standards, provide habitable accommodation, access to first aid health services, recreation facilities, proper cooking and eating facilities that do not rely on coal or wood collection and efficient waste disposal facilities.

The contractor must have an emergency procedure for managing outbreaks of infectious diseases as well as providing education and free equipment for the prevention of communicable diseases, including the supply of condoms.

The presence of temporary and foreign workers in the community presents a challenge. Challenges in terms of community safety include a potential for an increase in the incidence of crimes, an increase in alcohol consumption, an increase in sexual harassment of women and prostitution, the potential for the transmission of sexually transmitted diseases, including HIV. The worker code of conduct will detail expectations and compliance with workers causing problems in the community. The impact is high. Foreign employment should be avoided.

### **7.11.6 Trafficking In Persons**

The Millennium Challenge Corporation is committed to working with partner countries to ensure appropriate steps are taken to prevent, mitigate and monitor trafficking in persons (TIP) risks in the projects it funds. MCC has adopted an approach that includes incorporating TIP into determining country eligibility for MCC funding as well as assessing and managing TIP risks on MCC-funded projects.

The policy defines Trafficking in Persons in two broad categories:

1. The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery. A victim need not be physically transported from one location to another in order for the crime to fall within these definitions
2. Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age – see section 7.9.6;

A project can have a TIP-related impact on the community during implementation in two ways: the actions of contractors/subcontractors/workers, intentionally or unintentionally contributing to TIP: or a failure in project safeguards leading to members of the community, including women and minors, becoming more vulnerable to being trafficked for sex.

#### **7.11.6.1 Trafficking in Persons Through Employment – Employer Behavior**

The most direct way in which TIP can impact projects funded by MCC is through exploitative recruitment practices and/or labor conditions for workers, particularly construction workers. The MCC recognizes that many exploitative labor practices are not readily detectable on labor sites, but instead are grounded in practices within the labor migration chain. These practices involve:

- The charging of large and (usually) illegal recruitment fees, which place workers in a situation of debt and therefore essentially bind them to the workplace even when they are not physically restricted from leaving.
- Changing terms of employment illegally once work has started, often when the employee is physically removed from their home area
- Low or unequal pay for equal work
- Withholding payments
- Removal of identity documents including passports as hostage for work
- Charging excessive amounts for food and employee services
- Forcing extra (often unpaid) overtime work
- Employing child labor
- Not permitting rest days or not honoring festivals and religious observance
- Physical and verbal abuse
- Not having a formal grievance system internal to the company for employees to make complaints

Impact Assessment: The potential for trafficking in persons for both men and women to work at construction sites is high and negative, particularly if foreign or imported labor is employed. The opportunity of jobs on the BWSE may be used to traffic people for work by unscrupulous employers and enable exploitation of the work force. These impacts are felt by both workers and local communities.

Community health and safety impacts are felt by both imported labor and local labor and their families in terms of:

- Low wages and unstable employment provision. Lack of written contracts of employment allow unscrupulous employers to increase hours, reduce wages or summarily dismiss workers leading to increased impoverishment and uncertainty of the means of survival.
- Uncertain income and increased poverty leads to poorer health through lower spending on health related items. Reduction of rest days impacts on health of workers through the lack of restorative rest and impacts on the family through the absence of the working



adult as part of family life. Physical and verbal abuse contributes to poorer mental and physical health.

- The introduction of imported labor is likely to impact on the health of local communities through the increase in sexually transmitted diseases and transmission of HIV/AIDS to local communities as well as threaten social stability by creating demands for prostitution.
- Increased poverty leads to increased willingness to send children to work leading to higher rates of child labor and pressure on rates of pay for adults.

Employers have to be monitored to ensure that these forms of exploitation and impact are not permitted. The project will require that each contractor submit a copy of its IFC PS 2 compliant employment policy and copies of the contracts of the formal written employment contract and a copy to be given to each employee. The contracts must also conform to the Mongolian Law on Labor and offer equal and fair pay and conditions for equal work regardless of gender or nationality. The MCA-Mongolia or its representative's Health and Safety Team is responsible for checking employment contract records. Mongolia is both a recruiting and destination country in terms of trafficking in persons for work. The project must require contractors to explicitly accept the requirements of the MCC Policy on Counter-Trafficking in Persons and demonstrate this in the terms of employment they offer.

Contractors are required to manage their workforce in the light of compliance with IFC PS 2 and the MCC Policy on Counter Trafficking in Persons. This is described in Section 11.6.4. Contractors are prohibited from permitting employment of children. Contractors have to install and facilitate a worker's GRM and keep records of incidences of grievances and outcomes.

### **7.11.7 Employee Behavior – Project Risks and Responsibilities**

The MCC Policies on Trafficking and Gender recognize a number of social project impacts on women in the project area of influence that they require to be mitigated in project design and implementation. These arise out of prejudicial attitudes to women and the lesbian, gay, bisexual, transgender, queer (or sometimes questioning), and others (LGBTQ+) community, unequal gender relations and gender inequity such that women and some men are at risk of:

- Trafficking of Persons for Sex
- Sexual harassment,
- Gender based violence,
- Unequal employment terms and access to employment

The project is exposed to numerous social risks through the actions of employees of contractors whilst simultaneously be required to ensure compliance with MCC Policies on Gender and Social Inclusion and on Counter-Trafficking in Persons. Section 7.9.6.1 proposed ways of addressing social risks and impacts posed by contractors as employers, this section looks at how employee risks and impacts arise and can be addressed, supervised and monitored.

#### **7.11.7.1 Trafficking of Persons for Sex**

Sex trafficking is the activity in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age. The exploitation is usually of women and minors who are induced to become sex workers in their home areas or who are transported, often over international borders, and are then forced into prostitution. Mongolia is a recruiting country in terms of trafficking in persons for sex with women being transported to UB and surrounding countries – North Korea, China etc. In 2019, 9 cases of human trafficking were reported in Mongolia, all in UB. This accounted for 12.2 percent of all crimes against the right to liberty and security of person (Crime Statistics 2019, National Statistical

Office). Of the 9, 5 were girls aged 14-17 years. The trafficking of girls under 18 years has been only seen from 2013 onwards, previously most trafficked girls were aged 18-29 years.

A clear potential TIP risk is associated with the actions of contractors and workers through increased demand for sex services/sex workers in the local community, particularly where the project involves an influx of predominantly male workers. Depending on the context, this increased demand for sex services is commonly met by a combination of harmful sexual activity with, and exploitation of, people in surrounding communities, and commercial sex with those in prostitution, each of which carries its own set of risks. It is important, however, to highlight that an increase in demand for commercial sex is not analogous with an increase in sex trafficking.

The risk of sex trafficking is present in the practice of project workers offering transport to community members as this opens the possibility that project vehicles could be used in the transporting of trafficking victims (as well as the possibility of direct exploitation of passengers by drivers). The MCC's policy in this regard is to prohibit the practice on all projects unless there are compelling reasons to not do so. It is likely that workers also contribute to TIP by bringing in child domestic workers.

There is a risk that workers on the project could engage in the sexual exploitation of adults and minors; therefore, there must be clear and effective measures that can be taken against companies that do not take action against sex trafficking by employees. The measures have to be in place from the start of the project so that the risk of sex trafficking is recognized and can be managed from the start by all parties. If ignored, sexual harassment by employees and the increased demand for commercial sex in local communities could lead to, directly or indirectly, trafficking on a wider scale.

The risk of sex trafficking in local communities is decreased if workers are local and remain in the community. Likewise, the potential for transmitting HIV/AIDs and other sexually transmitted diseases is reduced if local labor is employed.

#### **7.11.7.2 Sexual Harassment and Gender-Based Violence**

According to the National Study on Gender-based Violence (2018), "among ever-partnered women, 57.9 percent have experienced one or more of the following types of violence in their lifetime: physical, sexual, emotional and economic violence, and controlling behaviors; and 31.2 percent have experienced physical and/or sexual violence in their lifetime" Such information is relatable to the local situation in the project area. Qualitative data on this issue was not collected for this survey as data collection process in groups precluded confidentiality.

Sexual harassment is usually the verbal or physical pestering of women by men, often a precursor to sexual assault or physical violence. Harassment of women and violence meted out by men on women are human rights abuses enabled by male attitudes of the inferiority status of women that allow men to feel entitled to impose their behavior on women without sanction. However, men can also suffer sexual harassment and violence based on sexual orientation as the result of belonging to LGBTQ+ groups and these are equally unacceptable under the MCC Policy and guidelines.

Despite laws protecting women and men from these abuses, patriarchy and gender inequality are prevalent in Mongolia resulting in cases of gender-based violence and sexual harassment, including sexual harassment in the workplace. The socio-cultural sanction by men of such intimidation and violence is unacceptable under Mongolian law and MCC Policies and therefore needs to be addressed in the project design. During the construction phase, the potential for women to experience gender-based harassment is high, infringing on women's human rights and dignity. In this context, women frequently face being required to offer sexual favors in exchange for job opportunities, wage raises, and advancement.

The impact on workers is high and interventions in behavior will lower the significance of these issues through:

- Requiring all contractors to have an internal worker grievance mechanism that includes reporting allegations of sexual harassment and violence.
- The employment contract for all workers will specifically prohibit employee behavior of harassment and physical abuse, state zero tolerance of such behavior and that contracts will be terminated if accusations are proven.
- Employees must sign the code of conduct that includes explicit prohibition of harassment and abuse and awareness of the penalty.
- Contractors are required to add regular awareness training on harassment and abuse to the training schedule for employees and tool box talks. This training can be hired in from suitably expert organizations such as the Centre for Gender Equality in UB to ensure quality of content and delivery.

### **7.11.8 Employee Behavior in Relation to Cultural Heritage**

While identification and protection of sites of cultural and archaeological importance are mandated in the pre-construction phase, the focus on cultural heritage in the construction and operations and maintenance phases transfers to enabling access to the Songinokhairkhan mountain and other monuments and on the impacts of workers behavior on cultural heritage. The impact is moderate before mitigation.

#### **7.11.8.1 Songinokhairkhan Mountain**

The position of the mountain as a pre-eminent religious site, the Ovoo and the Monument, makes the continuation of access to the mountain for religious purposes a vital priority. The project design has provided a route to a car parking area and footpath around the AWPP to enable access whilst protecting marmots.

#### **7.11.8.2 Behavior in and around Cultural and Archaeological Sites**

Further culturally based risks arise through poor behavior by workers, particularly from outsiders with differing cultural values and experience. This can lead to disrespect for cultural locations through behavior that transgresses local norms. Behaviors that can lead to social conflicts are:

- Defiling temples and sacred sites with rubbish, defecation and urination, wearing leather and animal products in the vicinity, drinking on the site etc.
- Painting project related information on cultural sites, e.g., on grave stones or temple walls
- Ignoring potential new finds of archaeological importance, not using the Chance Finds Procedure

The conditions of contract will require contractors to include cultural sensitivity training and the chance find procedure in their training program and the employee code of conduct will mandate zero tolerance of cultural defilement with employment termination as the penalty.

### **7.11.9 Entrepreneurship and Business Development**

The Mongolian economy expanded rapidly in the 1990s and 2000s following the expansion of the mining sector. The construction industry also expanded as did business development supporting the expansion. Businesses were started by both men and women but many have found starting a business and keeping it running proved to be difficult. In 2018, the Asia Foundation estimated

that 40 percent of Mongolia's entrepreneurs were women.<sup>61</sup> Entrepreneurs received limited institutional support while women entrepreneurs in particular face significant cultural constraints because of their gender (SMEs and women-owned SME in Mongolia, 2014).

The implementation of the BWSE project offers opportunities for entrepreneurship and business expansion to supply the project in all phases and all levels. The implementation of the BWSE would offer opportunity for established entrepreneurs to expand their businesses and for other entrepreneurs to take new initiatives. An equal opportunity approach would enable women-owned businesses and women entrepreneurs to take advantage of the project implementation for start-ups or business expansion.

During the pre-construction phase, local firms were contracted by the BWSE project for design services and field investigations. These initiatives need to be extended into the construction and operations phases. Such involvement in the procurement and supply chain has been very successfully promoted on MCC projects through workshops for potential suppliers run by the project procurement team. The workshop covers aspects of procurement such as demand for products, procurement procedures and protocols, the tendering process and timescales. Making entrepreneurs aware of these factors encourages successful business interaction.

Local entrepreneurs may also develop and provide services such as cooked food, accommodation cleaning, car washing, grocery shops etc. to construction workers. According to the survey data, women in the community are looking forward to setting up food processing businesses, primarily serving meals to construction workers. Such activities are in line with women's traditional role in Mongolian society and mean more income for entrepreneurial households and better living conditions for families.

Fostering local construction employment by training and use of Brigades offer extensive opportunities to enhance local construction capability.

On a long-term basis, the outcome and activities of the BWSE would contribute to improving local services and expanding businesses. The expansion of entrepreneurship opportunities would be a major contribution to Mongolia development goal (Mongolia Vision 2015) as well and an opportunity to empower women.

### **7.11.10 Improved Water Quality and Supply**

The main objective of the BWSE project is to increase the supply and quality of clean water to UB. Supplies at present can be unreliable and need increasing and of higher quality but will only accrue to users of piped water distribution systems in UB – not most people in Songinokhairkhan and Khan-Uul districts. A major positive impact.

The expectation in the affected communities is that the increase in the city of Ulaanbaatar water supply capacity will allow an extension of water utility services to communities in the Khan Uul and Songinokhairkhan districts. Currently this is not planned. The SST will have to support MCA-Mongolia in making this known to the districts anticipating improved water supplies. For these communities the impact is negative, especially so if no employment benefits are received by the local communities.

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<sup>61</sup> <https://asiafoundation.org/2018/05/23/building-an-entrepreneurship-ecosystem-for-women-in-mongolia/>

### **7.11.11 Gender Equity and the MCC Policy on Gender and Social Inclusion**

Gender equality is a fundamental right guarantee by the Constitution (1992 Constitution). According to the World Bank (2018), Mongolia ranks 53<sup>rd</sup> out of 159 countries in gender inequality globally according to the Gender Inequality Index in the UNDP Human Development Index 2019. The Gender Inequality Index measures gender inequalities in three important aspects of human development—reproductive health, measured by maternal mortality ratio and adolescent birth rates; empowerment, measured by proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education; and economic status, expressed as labor market participation and measured by labor force participation rate of female and male populations aged 15 years and older.

The Gender Inequality Index is built to better expose differences in the distribution of achievements between women and men. It measures the human development costs of gender inequality. Thus the higher the Gender Inequality Index value the more disparities between females and males and the more loss to human development.

The GoM promotes gender equality as outlined in the Constitution of Mongolia (1992, article 16), which guarantees equal rights for men and women in the social, political, cultural, economic life and family relations. The law on Promotion of Gender Equality was passed in 2011 to emphasize the obligations of public organizations to protect citizens against gender-based discrimination.

According to the Human Development Report (UNDP 2019), Mongolia has worked hard to raise awareness on the situation of women, and the government has followed with policies to increase women's participation in the economy and balance gender inequality (Report of Labor Force Survey 2020 Millennium Development Goals). Mongolia organizes a National Committee on Gender chaired by the prime minister with a clear mandate to promote gender equality. Local governments and social institutions organize local gender committees to raise awareness and monitor gender equality in the project area communities. Residents mentioned being involved in activities and training regarding gender equality.

The Government of Mongolia has set closing gender inequality and empowering women as one of the country's major human development goals (Mongolia Millennium Development Goal 2020, Vision 2050). Women in Mongolia face both cultural constraints as well as lack of support to advance their participation in the country's development (World Bank 2018). Nevertheless, the country has made progress in developing a legal and policy framework to protect women and advance gender equality.

MCC Policy on Gender is applied throughout the project cycle, in due diligence on program and project design, in the oversight and assessment of compact implementation, and in the monitoring and evaluation of impacts. MCC Gender Policy requires an assessment of how social/gender analysis informs the involvement of different stakeholders and how the project plans to ensure the meaningful participation of women and men as the Compact is developed and the Compact program is implemented.

MCC's due diligence of the social impacts of all programs involves a gender analysis and inclusion of gender into the assessment of a program's feasibility. Gender is considered within the context of other relevant forms of social difference such as age and ethnicity and assesses the extent to which the proposed program design addresses gender differences and inequalities that limit economic growth and poverty reduction in a Compact program. The MCC require that the monitoring and evaluation plans have adequately incorporated gender considerations, including the collection of sex-disaggregated data.



The project design and plans for implementation have met these criteria through a gender disaggregated socio-economic analysis of the impacted community, gender disaggregated social impact assessment, and gender specific implementation procedures in a Gender Action Plan. These include both direct provisions and indirect support for the protection for women in the project. These are mapped out in Table 7-58.

### **7.11.12 Community Health and Safety**

The project affected areas have lower levels of health and other social service provision as they are located on the periphery of UB. The families in these communities tend to be poor and experience multiple levels of disadvantage; many may have lower levels of health from which to start the project impacts.

The presence of temporary and foreign workers in the community is an opportunity and a challenge. The main social impacts on community health are generally negative and most derive from the effects of importing labor from outside the districts or Mongolia. The impacts from imported labor are:

- Importation of diseases currently unknown or of different type to those found locally, e.g. different variants of influenza, colds, pneumonias, etc.
- Increase in the distribution and types of sexually transmitted diseases, e.g. importation of drug resistant variants of various STIs from mutations found in other countries and an increase incidence of STIs through increased prostitution.
- Increase in social ills of increased prostitution, alcohol consumption, gambling and the taking of illegal drugs by imported labor accommodated as (usually) single men in labor camps. These impact local communities through the effects of having large numbers of single men seeking entertainment and leisure in local communities. Local communities are drawn into drinking and gambling more, having easier access to recreational drugs and are affected by women being harassed for sex.
- Rowdy leisure behavior is usually associated with increased violence in the community.
- Imported labor is often associated with increased crime. The police statistics and community perceptions presented in Section 4 and Section 6 bear this out.

Other general impacts regardless of source of labor accrue from:

- Increased traffic is associated with an increase in traffic and other work-related accidents.
- Local health and nutrition will improve if local labor is employed as increased income can translate to improved nutrition, especially if women are employed.

During construction, the BWSE project would set up workers' camps. The project would have clear procedures regarding workers' safety in the camp and provide clean sanitation and a healthy environment with access to designated primary health care.

Safety hazards to be managed during construction include open trenches, openly stored construction materials, moving construction equipment and vehicles, and redirected traffic. Roads adjacent to the installed pipelines would be subject to partial or total, periodic closure during the construction sequence, which may impair access for emergency vehicles traveling through the project area. Risks to public safety due to construction work on main roads and within populated areas would include the possibility of increased accidents during project construction, including the potential for increased incidents of falls among the local inhabitants, especially children.

The following sources of potential contamination would be present during construction and, to a lesser extent, during operation and maintenance:

- Leakage of lubrication oil, gear oil, and transmission oil from construction vehicles and equipment
- Spills of potentially contaminating materials, such as adhesives, solvents, lubricants, paint, or biocides, during storage or use on the construction sites

The Contractor would employ best management practices including but not limited to the following technical specifications:

- Section 01030, Special Requirements
  - Paragraph 1.03.A - For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
  - Paragraph 1.03.B - Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
  - Paragraph 1.03.C - The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.
  - Paragraph 1.04.D – 1) Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.  
2) The Emergency Action Plan shall include, but not be limited to the following:
    - a. Identification of hazards and risks associated with the Project.
    - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
    - c. Contractor's standard operating procedures, including personnel training and field orientation.
    - d. Levels of protection and selection of equipment procedures.
    - e. Field monitoring of petroleum products and potential pollutants.
    - f. Contingency and emergency procedures.
    - g. Listing of emergency contacts
  - Paragraph 1.04.E – 1) The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.  
2) Certain chemical and physical agents (i.e., asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulatory agencies, the Contractor shall notify the Owner immediately of the nature of the incident.

- 3) The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
    - a. The location of potential hazards.
    - b. The potential adverse health effects posted by such hazards.
    - c. Proper safe work practices to prevent or reduce potential exposure.
    - d. Proper protective measures and equipment required.
    - e. Proper use of protective equipment.
    - f. Proper response to exposure incidents.
    - g. Proper disposal of hazardous materials.
  - 4) The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:
    - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
    - b. Hearing protection (plugs, muffs, etc.).
    - c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).
- Paragraph 1.09.A - Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
  - Paragraph 1.09.B - There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
  - Paragraph 1.09.C - Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.
  - Paragraph 1.11.B - For the protection of life and property all backfilling operations shall follow closely behind pipe laying. Ensure that no excavation is left open, unguarded, or water filled during any period of time when Work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other Work areas.
  - Paragraph 1.20.A - The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
    - No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
    - No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.
    - Section 01046, Control of Work
  - Paragraph 1.21.A – During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the

Project site(s) at all times and be emptied as required to prevent odors and vermin.

- Paragraph 1.21.B – Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- Paragraph 1.21.C – At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.
- Paragraph 3.01.B - Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.
- Paragraph 3.05.A - All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- Paragraph 3.05.B - The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted

Section 01063, Miscellaneous Requirements

o Section 01110, Environmental Protection Procedures

- Paragraph 3.03.C – All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer
- Paragraph 3.04.F - Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- Paragraph 3.05.B – Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.
- Paragraph 3.05.C – An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.

- Paragraph 3.05.D – Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.
- Section 01500, Temporary Facilities
  - Paragraph 2.05. A - Temporary Perimeter Fencing
    - f. Temporary perimeter fencing is to be supplied and installed by the General Contractor, to enclose and secure the field offices, while providing screening of construction activities.
    - g. Temporary fence shall be 2.4 meters (8 feet) above grade. All fence panels shall align with adjacent panels along top.
    - h. Fencing metals to be low sheen black finish, 60 mm (2 3/8") galvanized posts with 11 gauge chain link fencing, 41 mm (1 5/8") top and bottom rail. All fencing is to have screening fabric, attached with galvanized metal heavy gauge wire clips, black color.
    - i. Screening fabric shall be knitted polyethylene cloth, with reinforced band and grommets along top and sides for secure anchoring to chain link panels.
    - j. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.
- Section 01610, Delivery, Storage and Handling
  - Paragraph 1.05.C – 1) The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.
    - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:  
Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
    - b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
    - c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.
    - d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
  - 2) Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.
- Section 01710, Cleaning Up



- Paragraph 1.01.A - The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
- 6. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
- 7. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
- 8. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
- 9. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
- 10. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
- Section 02672, Water-Supply Well Construction, Development and Pumping Test
  - Paragraph 1.15.A - During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer.
  - Paragraph 3.11.A – After completion of the Work, remove tools, appliances, surplus materials, temporary drainage, rubbish, and debris incidental to Work. The contractor shall prevent off-site discharge of turbid water, stormwater, and other contaminants. Excavation and vehicular ruts shall be backfilled and dressed to conform with the existing landscape. Utilities, structures, roads, fences, or any other pre-existing item which must be repaired or replaced due

to the Contractor's negligence shall be the Contractor's responsibility; repair or replacement shall be accomplished prior to completion of this contract.

- Paragraph 3.11.B – At the option of the Owner, the Contractor shall abandon existing 273- or 300-mm diameter test wells and 168-mm diameter observation wells (installed in 2019) at the conclusion of the well-construction program. Contractor shall abandon test wells as follows:
  - Contractor shall disinfect the well in sufficient quantity so that a concentration of 50 ppm of chlorine is present throughout the entire length of the well prior to well abandonment.
  - Contractor shall fill the bottom of the well with processed sand (see Transition Pack in Paragraph 2.07, above).
  - Contractor shall then cap the processed sand with 9 meters (30 feet) of Well Sealant (see Paragraph 2.08, above) by pumping the sealant through a tremie pipe placed at the top of the backfilled processed sand.

**Table 7-58 Gender Action Plan**

Area of Impact		Actions: Areas in which the planning for project planning must be specifically aware of the needs of and can plan for women
<b>Data Collection:</b>	<p>Have women and vulnerable groups been included in the socioeconomic survey?</p> <p>Has information been collected on women's and vulnerable groups' land and property status?</p> <p>Does the survey include questions on household division of labor, women's livelihood sources, and women's contribution to family income for all households including vulnerable groups?</p>	<p>All socio-economic survey forms will collect specific sex disaggregated data, look at women's activities and the split of work, access to resources and income sources within the household.</p>
<b>Eligibility and Entitlements:</b>	<p>Provision must be made to ensure that women get legal rights to land and property allocated as part of the resettlement package.</p> <p>Creation of new formal institutions may undermine rights that are enshrined in customary arrangements.</p> <p>Customary law and informal institutions can and have been known to be discriminatory to women.</p>	<p>Women-headed households will have the title re-registered in her name</p> <p>Families will be encouraged to register the title in the names of husband and wife</p> <p>Compensation for loss of women's property or usage rights will be paid to women.</p> <p>New community organizations will include women as members and as officers.</p> <p>Women have equal rights to compensation and livelihood restoration</p>
<b>Income Restoration:</b>	<p>The needs and problems of women are likely to be different from those of men, particularly in terms of social support, services, employment, and means of subsistence for survival. For example, relocated women might face greater difficulty than relocated men in re-establishing markets for home industry produce or small trade items if they are constrained by lack of mobility or by illiteracy. Income-restoration programs should address gender issues adequately.</p>	<p>Income Restoration and Vulnerable People's Plans will address the needs of men and women separately.</p> <p>Women only training programs will be established addressing interests and skills of women where necessary</p> <p>Skills development training for men and women addressing different interests</p>
<b>Gender issues in Employment</b>	<p>Women face unfair restrictions on working:</p> <p>Overlooked for jobs, lower pay, restricted access to employment sectors, sexual harassment at work, unfair conditions of employment – anti trafficking</p>	<p>Contractors to have achieving 30% employment of women encouraged in their contracts. Compliance with Labor Law and MCC Gender Policy on equitable conditions of employment for men and women for the same work</p> <p>Contractors must have a worker code of conduct mandating acceptable behavior in the workplace and all employees have to be made aware and sign. Zero tolerance of sexual and abusive behavior in the workplace. SST will monitor and enforce.</p> <p>Contractors will be required to hire in specialist training on worker behavior towards women, sexual harassment and physical abuse of women and conflict resolution, SST will advise and monitor the training programs</p>
<b>Trafficking in Persons</b>	<p>Women and minors are at risk of being trafficked for sex</p>	<p>In addition to the items above, Contractors are required to take measures to avoid sex trafficking by their employees, e.g. no transporting of non-employees in company vehicles</p> <p>Worker camps to be based at least 2 km from communities</p> <p>Worker education on sexual health and social ills</p>

Area of Impact		Actions: Areas in which the planning for project planning must be specifically aware of the needs of and can plan for women
		Prohibition of enabling or fostering prostitution by employees.
<b>Relocation Site Selection:</b>	Reasons for selecting or rejecting a site can differ widely between women and men. For women, distance from the workplace, physical safety, availability of facilities, especially for children, and proximity of kin and other social networks are some of the key considerations.	Women will be consulted about relocation options and preferences. Women will be included on reconnaissance trips to relocation sites.
<b>Housing Reconstruction</b>		Women headed households may need assistance to rebuild housing and will be targeted for assistance by the MCA-Mongolia or its representative's Community Liaison Officer
<b>Sanitation:</b>	Lack of appropriate and adequate toilet and sanitation facilities affect women the most. Their inputs on such facilities must be obtained and incorporated in the resettlement plan.	Sanitation issues and facilities must be included in the plans, there must be separate toilets and facilities for men and women. These must allow disabled access.
<b>Health:</b>	Involuntary dislocation and displacement can increase morbidity. It can affect people both physically and psychologically. Loss of land or livelihood can result in loss of self-esteem in men, which in turn sometimes leads to violence against women and children. HIV/ AIDS and sexually transmitted diseases can be spread during the construction phase	Monitor health impacts on women and children through NGOs HIV/AIDS community information program run by the SST to increase awareness of dangers to women and children Support to women so as to be able to resist being drawn into the sex industry through liaison with NGOs such as the Centre for Gender Equality Set up contractor training programs for employees covering sexual harassment and gender-based violence. community liaison officers to monitor contractor training programs, assist contractors to hire in an NGO to deliver training on gender issues
<b>Transition Issues:</b>	Some women may need special assistance for transportation and transit. For relocation to the new site, the transition period between dismantling of one home and resettling in the new is crucial. Temporary arrangements often do not provide for basic needs of women and children, such as sanitation, drinking-water facilities and schools.	Ensure allowances are accessible to women in households. Ensure people have adequate time to relocate their houses.
<b>Participation and Consultation:</b>	Social and cultural factors may exclude women from participating actively in planning, implementing, and executing resettlement activities. Special efforts need to be made to ensure their inclusion. Often, planners operate via male elite, who may not represent the community in it's entirely and especially women. Unless women's participation is ensured, male biases in administration and legal systems might both undermine women's rights in customary institutions and disadvantage vulnerable women. Widows, the elderly, divorced women, and women-headed households may suffer as a result of this bias.	Women are to be included in the participation and consultation program. Women only meetings will be held where appropriate Women will be represented on all committees and bodies for the project Women will be enabled and encouraged to take up these opportunities.

Area of Impact		Actions: Areas in which the planning for project planning must be specifically aware of the needs of and can plan for women
	The key to participation is full information. If the affected persons are to exercise their rights to rehabilitation, they must be fully informed.	
<b>Grievance Redress:</b>	The GRM must be adequately constituted to deal with gender issues that may arise and include mechanisms to provide specific service for women	The community liaison officer will assist women to bring their grievances for discussion The SST will assess whether training on gender issues would assist the treatment of female grievances with appropriate seriousness
<b>Resettlement Budget:</b>	Does the RAP identify the financial resources required for gender-targeted activities? Are specific provisions to address gender issues included in the budget line items?	Check to see that sufficient budget lines have been included to ensure the Gender Action Plan can be implemented
<b>Implementation and Information:</b>		Ensure all project officers are informed about the contents of the Gender Action Plan



## 8. Impacts of Climate Change on Project Components and Outcomes

### 8.1 Climate Change Projections over Mongolia

#### 8.1.1 Present Climate Change

Mongolia has a severe continental climate with long, cold winters and short, relatively hot summers. The annual mean air temperature is about  $-4$  degrees Celsius ( $^{\circ}\text{C}$ ) in the Altai, Khangai, Khentii and Khuvsgul mountain ranges,  $-6$  to  $-8$   $^{\circ}\text{C}$  in the depressions between mountains ranges and along the valleys of the major rivers,  $+2$   $^{\circ}\text{C}$  in the steppe-desert region and  $+6$   $^{\circ}\text{C}$  in the southern part of the country. Annual precipitation exceeds 400 millimeters at high mountain belts, it is 300-400 millimeters in the Khangai, Khuvsgul and Khentii mountains and in the Khalkh river basin in the eastern part of the country, 250-300 millimeters in the Mongol Altai and forest-steppe, 150-250 millimeters in the steppe and 50-150 millimeters in the Gobi and desert region. In Mongolia, 85 percent of total precipitation falls as rain in the warm season and only 3 percent or less as snow in winter. In terms of sunshine, Mongolia has high numbers of days with clear skies, ranging from 230 to 260 sunny days per year. Total sunshine duration ranges from 2,600 to 3,300 hours per year. Therefore, the solar energy resource is relatively high. The Mongolian steppe and desert-steppe regions are very windy. The annual average wind speed in these regions is 4-6 meters per second (MET, 2018).

Observations from sixty stations distributed across the country show that the Mongolian climate has already changed significantly. In the last 76 years Mongolia has experienced the following:

- Annual mean temperatures have risen by  $2.24$   $^{\circ}\text{C}$  during the last 76 year (1940-2015). The warming has been most pronounced in winter, with a mean temperature increase of  $3.6$   $^{\circ}\text{C}$ , while spring, autumn, and summer mean temperatures have risen by  $1.8^{\circ}\text{C}$ ,  $1.3^{\circ}\text{C}$ , and  $0.5^{\circ}\text{C}$  respectively.
- Annual precipitation changes are quite variable, decreasing at one station and increasing at another nearby. Seasonally, autumn and winter precipitation has increased by 4 to 9 percent, while spring and summer precipitation has decreased by 7.5 to 10 percent. Spatially, since 1961 precipitation has increased in the Altai mountain region, the Altai Gobi and in the eastern part of the country. In all other regions it has decreased by 0.1 to 2.0 millimeters per year.
- The number of hot days has increased between 8 and 13 days per year and the number of cold days has decreased between 7 and 11 days.

Mongolia has been identified as one of the most vulnerable countries to climate change due to its geographic location (MET, 2014), and climate change is expected to have significant impacts in the future. Thus, Mongolia joined the United Nations Framework Convention on Climate Change in 1993 and it's Kyoto Protocol in 1999. The Government of Mongolia has adopted national and sectoral strategies and policies which address climate change adaptation and mitigation, including the National Action Plan on Climate Change (2011-2021), the Green Development Policy (2014-2030), the Intended Nationally Determined Contributions under the Paris Agreement (2015-2030), State Policy on Renewable Energy (2015-2030), and Mongolia's Sustainable Development Vision 2030. Detailed information can be found in Section 2.

#### 8.1.2 Future Climate Change Impacts

The representative concentration pathways (RCP) for greenhouse gases depending on future trends in socio-economic development were released in the fifth assessment report of the

Intergovernmental Panel on Climate Change (IPCC-WG I, 2014). These are integrated into global climate models to provide future climate change projections for all countries. Recently, about 40 global climate models with different greenhouse gas emission scenarios have been run by many organizations, including international centers, institutes and universities around the world (Taylor et al., 2012).

Future projections of climate change trends for Mongolia have been estimated from 2016 to 2100 with 10 global climate models under high (RCP8.5), middle (RCP6.0) and low (RCP2.6) greenhouse emission scenarios. The time-slices selected for climate change projections are the near future, from 2016 to 2035, and far future, from 2081 to 2100, which are run under the different RCP scenarios mentioned above (MET, 2018).

In general, projected temperature changes depend directly on the intensity of greenhouse gas emissions. However, projected winter temperature changes are slightly smaller and inter-annual variability is greater when compared to projected summer temperature changes. The intensity of temperature changes are similar for all RCP scenarios for the first half of this century, then the results deviate with the passing of years. In the near future between 2016 and 2035, the seasonal temperature change will range between 2.0 °C and 2.3 °C, but in far future from 2081 to 2100 it be expected to vary between 2.4 °C and 6.3 °C, depending on RCP scenarios (see Table 8-1).

The downscaled regional modeling systems used project precipitation increase in all seasons. Winter snow is forecast to increase, while less significant increases are expected for summer rainfall, with only slight increases of less than 10 percent estimated for all scenarios. Winter snow is projected to increase between 10.1 and 14.0 percent in the near future, 2016 to 2035, and between 15.5 and 50.2 percent in the far future, 2081 to 2100, depending on the emissions scenarios (see Table 8-1).

The results of seasonal climate change projections for Mongolia under different greenhouse gas emissions scenarios are summarized in Table 8-1.

**Table 8-1 Seasonal Climate Change for Mongolia under Different Greenhouse Gas Scenarios**

GHG Scenario	Emission	Season	Near Future, 2016-2035		Far Future 2081-2100	
			Temperature Change, °C	Precipitation Change, %	Temperature Change, °C	Precipitation Change, %
<b>RCP 2.6</b>		Winter	2.3	10.1	2.5	15.5
		Spring	2.3	9.2	2.4	11.7
		Summer	2.2	6.2	2.5	5.1
		Autumn	2.1	7.6	2.4	7.6
<b>RCP 4.5</b>		Winter	2.1	12.3	3.7	28.7
		Spring	2.0	7.8	3.4	17.4
		Summer	2.1	1.1	3.5	7.8
		Autumn	2.0	8.1	3.4	11.7
<b>RCP8.5</b>		Winter	2.2	14.0	6.3	50.2
		Spring	2.2	9.8	5.6	28.6
		Summer	2.2	2.4	6.0	8.7
		Autumn	2.2	6.4	6.1	24.1

As shown in Table 8-1, the highest intensity of warming of 6.0 to 6.5 °C is under the RCP8.5 scenario for the far future. It is projected for the western and eastern parts of Mongolia in winter and the western part of the country in the summer season. For the same scenario, winter snow is projected to increase by 50 to 75 percent in the central, western and eastern parts of Mongolia, while summer rainfall is projected to decrease by 5 to 10 percent in the western part of the country and increase slightly up to 10 percent in the remaining territory.

Based on skilled assessments of the 10 global climate models mentioned above and availability of data, the outputs of 2 global climate models, specifically the ECHAM5 (Max Plank Institute for Meteorology, Germany) and HadGEM2 (Hadley Center, UK), have been dynamically downscaled with the regional climate model RegCM4. In the analysis, the territory of Mongolia is the selected area between 41.5 and 52.0 degrees latitude and 87.5 and 120.0 degrees longitude. The regional model domain was fixed with a 30-kilometer grid resolution. The downscaled climate change projection for Mongolia is done under the RCP8.5 scenarios for different time-slices, including the baseline from 1986 to 2005, and future time-slices such as 2016 to 2035, 2046 to 2065, and 2081 to 2100.

With respect to the 1986-2005 baseline period, the downscaled climate change projections indicate that the RegCM4-HadGEM2 model gives a relatively greater change of temperature and precipitation than the RegCM4-ECHAM5 model. In both models, winter temperatures and snowfalls are projected to increase more than in summer. Overall, there are projected increases in summer rainfall, up to 10.7 percent with the RegCM4-ECHAM5 model and up to 21.4 percent with the RegCM4-HadGEM2 model. Nevertheless, according to the spatial pattern output of both models, there is a projected decrease of up to 10 percent in summer precipitation in the central part of the country for all future time-slices.

At the country level, however, average annual precipitation is projected to increase. Mongolia will be slightly wetter by 20 millimeters per year by 2050 and by 44 millimeters per year by 2090. Most of the increase is expected to occur in the winter. The projected increase in precipitation together with greater seasonal variation and more severe extreme events will increase the frequency and severity of floods. The impact of precipitation changes will be greater than the impact of temperature fluctuations. If annual precipitation drops by 10 percent and temperatures remain the same, it is estimated that average river flows would decrease by 7.5 percent (MET, 2017). Continued warming may exacerbate ongoing diminution of water resources and desertification, the latter already affecting 78 percent of the country.

Changes in precipitation, evaporation and temperature regimes, and in soil and other environmental factors, will affect groundwater resources throughout the country. Higher temperatures and droughts will result in increased evapotranspiration. Aquifers will also suffer from the trend of heavier precipitation events, because more water will go to runoff before it can percolate into the aquifers. Thus, even in a future where overall precipitation increases, aquifer levels may decrease.

Mongolia has a continental climate and is located in an arid region. In general, precipitation is the only source for the hydrological cycle and water is only lost due to evaporation processes in arid and semi-arid regions (Byambakhuu, 2011). Thus, climate change is expected to contribute to reduced aquifer recharge and water levels because of changes in precipitation and increases in evapotranspiration, even with the anticipated larger summer rain events. Climate change impacts including increase of air temperatures, decrease of precipitation, and increased frequency and intensity of natural disasters such as drought, dzud and flooding, combined with changing land use patterns due to population growth and infrastructure expansion, has led to significant reduction of water resources and deterioration of water quality in UB (AECOM, 2018b).

### 8.1.3 Surface and Groundwater

Mongolia's water resources form part of three distinct main hydrological basins: the Arctic Ocean Basin, the Pacific Ocean Basin, and the Asian Internal Drainage Basin. In the Mongolian part of the Arctic Ocean Basin, the hydrological network is comparably well-developed and the natural conditions are pleasant. In Mongolia, the average precipitation in the Arctic Ocean Basin is 27 percent higher than that in the Pacific Ocean Basin and 80 percent higher than that in Asian Internal Drainage Basin. Hence, average runoff depth is 1.95 times higher and evapotranspiration is 11 percent higher in the Arctic Ocean Basin than in the Pacific Ocean Basin. Analogously, runoff

depth is 4.7 times higher and evapotranspiration is 44 percent higher in the Arctic Ocean Basin than in the Asian Internal Drainage Basin. Average water temperature in the Arctic Ocean Basin for the period from April through October is 3.1 to 3.3 °C less than in the other two basins. Evaporation from open water surface is also less by 30 to 39 percent in the Arctic Ocean Basin.

The country is divided into 29 river basins for water resources management purposes. The total water resources of Mongolia are estimated as 599 cubic kilometers. The potential impacts of climate change on water resource were evaluated with the downscaled RegCM4-ECHAM5 and RegCM4-HadGEM2 regional climate models and are summarized as follows:

- Annual mean precipitation, as projected by RegCM4-ECHAM5 with respect to annual mean precipitation observed during the 1986-2005 baseline period, is expected to increase in the 2016-2035, 2046-2065, and 2080-2099 time-slice periods respectively by 0.01, 30.6, and 53.7 millimeters in the Arctic Ocean Basin, by 0.01, 20.6, and 32.9 millimeters in the Pacific Ocean Basin, and by 0.02, 19.9, and 41.4 millimeters in the Asian Internal Drainage Basin. Annual mean precipitation projected by RegCM4-HadGEM2 model is higher than that projected by the RegCM4-ECHAM5. Specifically, it is higher in the 2016-2035 period by 20.1 mm in the Arctic Ocean Basin, by 14.8 mm in the Pacific Ocean Basin and by 18.9 mm in the Asian Internal Drainage Basin, while projected changes in precipitation are nearly the same for both the RegCM4-HadGEM2 and RegCM4-ECHAM5 models in the 2046-2065 and 2080-2099 periods.
- Annual mean (April-October) evaporation from open surface water, as projected by RegCM4-ECHAM5 with respect to the annual mean evaporation from open surface water observed during the 1986-2005 baseline period, is expected to drastically increase in the 2016- 2035, 2046-2065 and 2080-2099 periods respectively by 143.5, 162.3, and 221.6 millimeters in the Arctic Ocean Basin, by 164.7, 364.5, and 370.2 millimeters in the Pacific Ocean Basin, and by 106.8, 96.1, and 150.2 millimeters in the Asian Internal Drainage Basin. Evaporation projected by the RegCM4-HadGEM2 model is less than that projected by the RegCM4-ECHAM5. Specifically, it is 2.08 to 5.35 times less in the Arctic Ocean Basin and Pacific Ocean Basin for all future time-slice periods, and in the Asian Internal Drainage Period it is 3.11 times less for the 2016-2035 period and 11 to 14 percent in 2046-2065 and 2080-2099 periods.
- Annual mean runoff depth, as projected by RegCM4-ECHAM5 with respect to the annual mean runoff observed during the 1986-2005 baseline period, is expected to increase in the 2016-2035, 2046-2065 and 2080-2099 periods respectively by 0.0, 8.9, and 15.6 millimeters in the Arctic Ocean Basin, by 0.0, 4.0, and 6.2 millimeters in the Pacific Ocean Basin, and by 0.0, 2.1, and 4.3 millimeters in the Asian Internal Drainage Basin. The runoff projected by the RegCM4-HadGEM2 model is less than that projected by the RegCM4-ECHAM5. Specifically, it is less in the 2016-2035 period by 6.0 millimeters in the Arctic ocean Basin, by 2.7 millimeters in the Pacific Ocean Basin, and by 1.8 millimeters in the Asian Internal Drainage Basin, while projected changes in runoff are nearly the same for both models in the 2046-2065 and 2080-2099 periods.
- Changes in water balance elements projected by the RegCM4-ECHAM5 model are basin specific. Almost no changes in precipitation and, consequently, no changes in runoff are expected in the 2016-2035 period. However, annual mean (April-October) evaporation from open surface water in the Arctic Ocean Basin is projected to increase by 128 millimeters per year for the Tuul River, by 71 millimeters per year for the Kharaa River, by 52 millimeters per year for the Eroo River, by 115 millimeters per year in the middle reaches of the Selenge and Orkhon rivers and by 60 and 174 millimeters per year respectively in their upper reaches. In the Pacific Ocean Basin, changes in evaporation are expected to increase by 95 millimeters per year for the Kherlen River, by 88 millimeters per year for the Onon River, by 52 millimeters per year for the Ulz River, by 67 millimeters per year for the Galyin River, and by 41 millimeters per year for the Khalkh River. In the Asian Internal Drainage Basin, evaporation is projected to increase by 74 millimeters per year for the

Khovd River, by 138 millimeters per year for the Zavkhan River, by 107 millimeters per year for the Khungui River, by 85 millimeters per year for the Baruunturuun River, by 45 mm/year for the Turgan River, by 130 millimeters per year for the Tes River, by 20 to 30 millimeters per year for the catchments draining from southern slopes of the Altai Mountains, by 182 to 313 millimeters per year for the catchments draining from the southern slopes of the Khangai Mountains, by 299 millimeters per year in the catchments draining from southern slopes of Gobi-Altai Mountains, and by 160 to 295 millimeters per year in the Galba-Oush-Dolood Gobi basins.

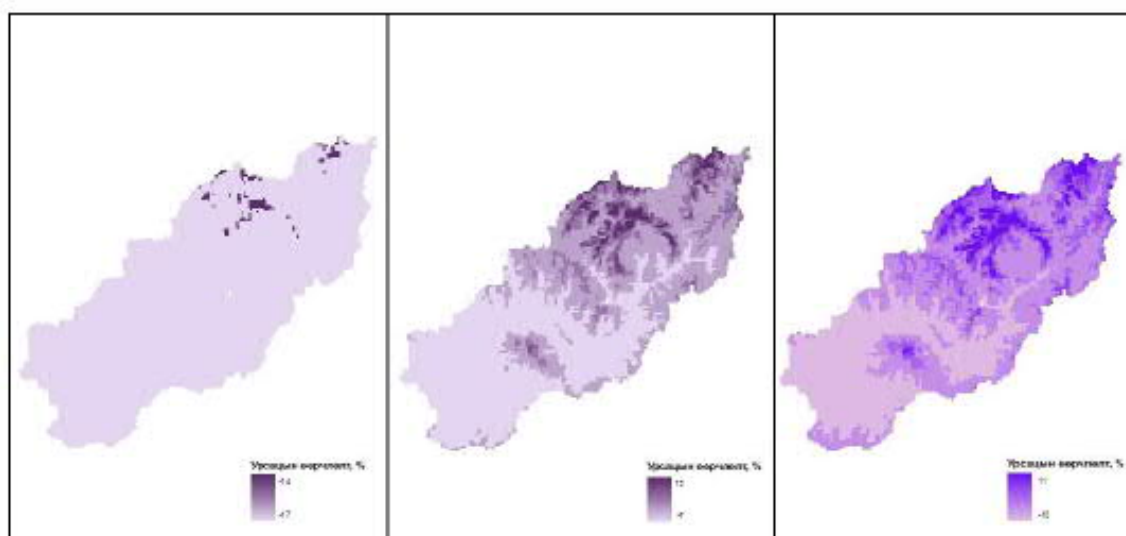
Changes in the hydrological balance for the Tuul River basin projected by a downscaled regional climate model show that precipitation and, consequently, runoff will increase whereas evapotranspiration will drastically increase, leading to an imbalance of the water cycle and, thus, a drying effect will prevail in the river basin.

Increased temperatures, extended periods of drought, and increased intensity of rain events in the summer will impact the flow, level, and quality of water in rivers, streams and lakes (AECOM, 2018b). A sensitivity analysis of climate change impact on Tuul River surface water was conducted and found that a 20 percent increase in precipitation could result in an increase of runoff to the Tuul River of approximately 58 percent (Byambakhuu et al., 2016). A summary of the results are shown in Table 8-2.

**Table 8-2 Tuul River Runoff Sensitivity to Changes in Temperature and Precipitation**

Change in Temperature	Evaporation (%)	Change in Runoff in the Tuul River, %				
		Change in Precipitation, %				
		-20%	-10%	0%	+10%	+20%
0°C		-42.1	-22.9		26.9	57.8
+1°C	5.6	-46.8	-29.1	-7.9	17.0	45.7
+2°C	11.4	-51.1	-34.8	-15.2	7.9	34.7

Climate modeling using the HADCM3 model (Hadley Centre Coupled Model, version 3), developed in the climate study section of the Strengthening Integrated Water Resource Management in Mongolia project, estimates that impacts of climate change on the Tuul River will include a decrease in flow of up to 17 percent in 2020, an additional 13 percent in 2050, and an additional 5 percent in 2080 (Byambakhuu et al., 2016) (see Figure 8-1). Moreover, for every 1°C increase in temperature, a 2 percent annual river flow decrease can be expected (MET, 2017). Therefore, temperature increase due to climate change will also likely impact the Tuul River flow.



**Figure 8-1 Tuul River Flow Change in 2020, 2050, and 2080 (%)**

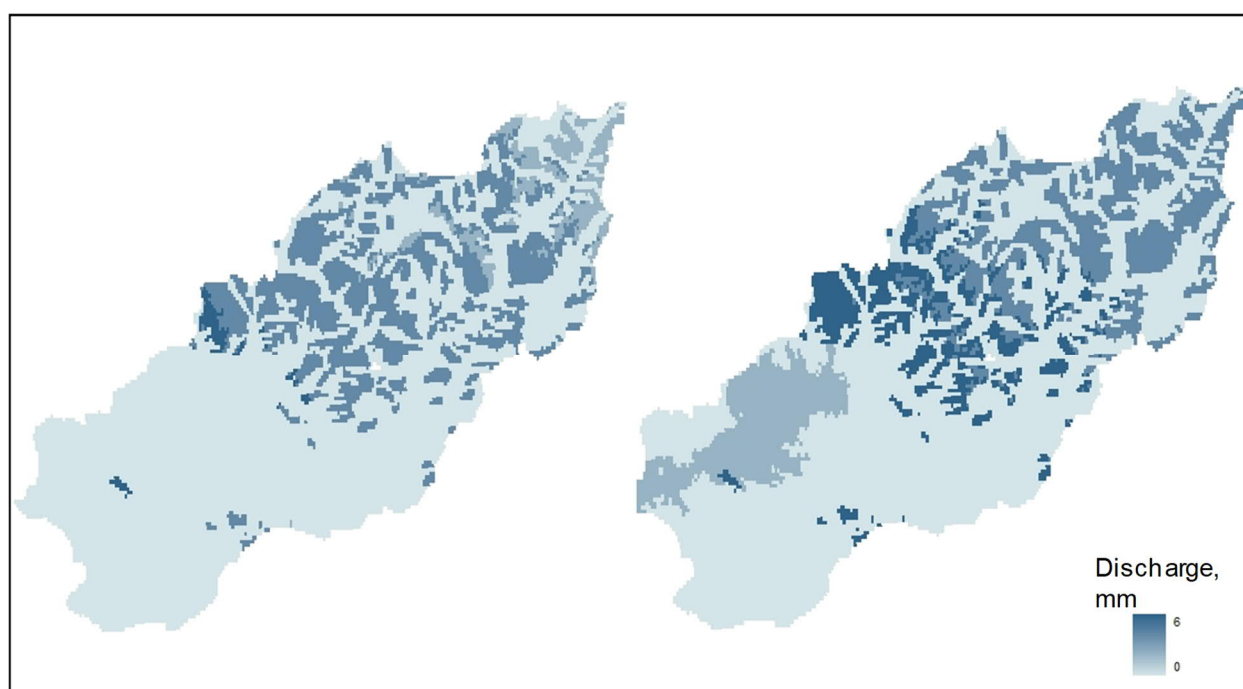


The climate of a region, its geological features, hydrogeological conditions, inner and outer rechargeable areas of groundwater resources, and biological processes have an important effect on groundwater resources and its formation (Byambakhuu et al., 2016). In other words, the Tuul River and the groundwater resources of the water supply in UB are hydraulically connected.

Therefore, the groundwater resources in UB depend greatly on the amount of precipitation for a given year since Tuul River recharge is greatly dependent on precipitation. On the other hand, the amount of groundwater recharge is significantly dependent on the base-flow distribution of Tuul River flows. Flows in the Tuul River are expected to decrease due to climate change in this region (see Figure 8-1). Moreover, the duration and thickness of ice cover in UB are expected to decrease too because of climate change (Dorjsuren et al., 2014).

Additionally, surface runoff reaching the Tuul River is increasing as changes in land use patterns reduce infiltration of precipitation into the ground. However, despite this, the average base-flow is decreasing (Byambakhuu et al., 2016). The impact of land use changes on the hydrological processes of the Tuul River was estimated with a HEC-HMS model.

Discharge measures for the Tuul River have increased at the Tuul-Altan-Bulag hydrological gauge due to increases of surface runoff caused by land use changes in UB, as shown in Figure 8-2. This result suggests that flood frequency, and socio-economic and infrastructure damage from flooding could increase in the Aol of the BWSE project. Moreover, this also has a severe impact on the eco-hydrological processes of Tuul River and indicates that in the future Tuul River and groundwater recharge and resources will decrease in the Aol of the BWSE project.



**Figure 8-2 Impact of Land Use Changes on Surface Water Resources without Settlement (left) and with Settlement (right)**

Climate change projections are also available for the Aol of the BWSE project, and are similar to the country-level projections summarized above. This is discussed in Section 8.2.

### 8.1.4 Climate Change Impacts in UB

The climatic characteristics of UB are also under the effects of climate change. The Climate Change Mitigation and Adaptation Sub-Program of UB was developed by the Environmental

Department, Municipality of UB in 2018 and it is based on key policy documents, including the Mongolian National Sustainable Development Concept 2030, the National Action Plan on Combating Climate Change, and the UB Development Plan 2020. It aims to fulfil the UB Governor's Action Plan to make UB “a city with a harmonious and green development concept and creating comfortable living conditions for citizens” by means of maintaining ecological balance, climate change adaptation and mitigation, reduction of greenhouse gas emissions, increasing production efficiency, and supporting green economic growth.

The Climate Change Mitigation and Adaptation Sub-Program of UB analyzed multi-year variation of average annual air temperatures and precipitation for the period between 1961 and 1990 collected at the Buyant-Ukhaa meteorological station, shown in Table 8-3.

**Table 8-3 Average Annual Air Temperature and Total Precipitation, 1961-1990**

Seasons	Temperature, °C		Precipitation, mm	
	Average of years 1961-1990	Variation	Average of years 1961-1990	Variation
Winter	-22.5	3.7	5.2	2.0 (38%)
Spring	-0.2	2.5	24.0	13.6(57%)
Summer	15.3	2.2	184.0	-24.1(-13%)
Autumn	-2.4	2.2	35.6	-3.1(-9%)
Year	-2.5	2.6	248.7	-11.7(-5%)

In the late 1980s air temperature increased intensively with heavy rainfall and snow, but since the early 1990s UB is experiencing less precipitation. Overall, there air temperatures have increased by 3.7 °C in winter, 2.5 °C in spring, and 2.2 °C in both summer and autumn. Precipitation has increased by 38 percent in winter and 57 percent in spring, and it has decreased by 13 percent in summer and 9 percent in autumn. In brief, increased air temperatures and precipitation were recorded during the cold seasons, while decreased precipitation was reported during the warm seasons.

UB is expected to be affected by a number of climate change impacts, as listed below:

- Increased number of days with higher extreme temperatures
- Increased number of days with lower extreme temperatures
- Changes to soil freezing and thawing period and frequency
- Increased water and weather related phenomena (heavy rainfall, floods and strong winds)
- Shrinking of green areas and loss of vegetation species
- Increase of insect population
- Increase of allergies and infectious diseases

UB is increasingly vulnerable to flood risk, in part due to the higher intensity of summer precipitation in recent decades and, in part, due to rapid urbanization. Rapid urbanization has increased impermeable surfaces, leading to larger volumes of runoff instead of water infiltrating into the ground. In relation to the BWSE project, flooding may cause damage during the construction and operational phases, affecting the water supply and its infrastructure. As described in Section 5, flood analysis in the Tuul River floodplain focused on the Biokombinat and Shuvuun wellfields was carried out with a HEC-RAS flood elevation model. Outputs from the model provided information on a statistically defined 100-year flooding event at the wellfield sites, based on historical data, which have informed the design to safeguard infrastructure (AECOM, 2020d). Climate change projections were not included in the model as there is no reliable statistical way to do so. Rather, safety factors were included in the design.

The annual and seasonal temperature and precipitation trends of UB are projected until 2100 using an average of the 10 climatic models and based on low, medium and high greenhouse gas emission scenarios and compared to the baseline period from 1986 and 2005, as shown in Table 8-8-4.

**Table 8-8-4 Climate Projections for UB for Three Scenarios of Greenhouse Loads**

GHG emission scenarios	Season	Near future, 2016-2035		Medium future, 2046-2065		Far future 2081-2100	
		Temperature change °C	Precipitation change, %	Temperature change °C	Precipitation change, %	Temperature change, °C	Precipitation change, %
<b>RCP 2.6</b>	Winter	1.5±0.6	9.5±8.1	1.8±0.6	16.2±8.8	1.5±0.8	13.1±11.1
	Spring	1.2±0.4	10.4±8.3	1.3±0.4	12.6±12.8	1.2±0.5	10.5±9.6
	Summer	1.0±0.3	9.2±9.6	1.6±0.3	6.2±9.8	1.4±0.3	8.3±7.0
	Autumn	1.4±0.4	5.3±10.4	1.6±0.3	7.0±10.3	1.5±0.3	6.1±10.6
<b>RCP 4.5</b>	Winter	1.2±0.5	9.7±9.2	2.1±0.6	17.9±7.7	2.8±0.7	28.3±8.7
	Spring	1.0±0.5	8.4±7.9	1.9±0.5	14.0±9.1	2.4±0.4	15.7±10.2
	Summer	1.1±0.4	2.8±6.9	2.0±0.3	7.3±8.6	2.8±0.3	4.9±10.0
	Autumn	1.1±0.3	4.9±7.7	2.2±0.3	7.8±9.2	2.7±0.3	8.1±8.2
<b>RCP8.5</b>	Winter	1.5±0.7	12.1±10.6	3.1±0.9	30.7±10.7	5.6±0.8	52.4±7.9
	Spring	1.3±0.6	8.1±10.2	2.7±0.8	17.2±7.8	4.8±0.6	26.0±10.4
	Summer	1.3±0.4	4.2±8.5	2.9±0.5	7.1±7.1	5.4±0.7	5.1±9.0
	Autumn	1.3±0.4	6.8±11.2	3.1±0.7	9.7±8.3	5.6±0.7	16±8.9

In general, projected temperature changes in UB are directly related to the intensity of future greenhouse gas emissions. However, the changes of the winter temperature and their annual fluctuations will be slightly higher than in summer.

The intensity of temperature change is projected to remain same, from 1.0 to 1.5 °C, for all greenhouse gas emission scenarios in the near future time-slice from 2016 to 2035, but it will be more divergent for each scenarios over time. Depending on greenhouse gas emissions, seasonal temperatures are expected to rise by 3.1 °C in the medium emissions scenario and by 5.6 °C in the high emissions scenario.

Precipitation is expected to increase in winter and experience a smaller increase in other seasons. In wintertime precipitation is projected to increase by 12.1 percent, 30.7 percent and 52.4 percent with each increasing emissions scenario, while summer precipitation is expected to increase by less than 10 percent for all scenarios.

Present climate change and future climate change projections in UB suggest that one of the most significant impacts will likely be on the hydrological system of the Tuul River and groundwater resources.

## 8.2 Climate Change Impacts on Project Components

### 8.2.1 Water Supply and Infrastructure

Around 30 percent of Mongolia's population has access to the water supply system. About 25 percent of the population receives water from the water transportation service, over 35 percent get water from water supply points and less than 10 percent use water from springs, rivers and snow water (WHO, 2018).

Mongolia has a high reliance on groundwater resources, which account for 80 to 90 percent of all freshwater consumed (MET, 2017). National water consumption is highest in the Tuul and Orkhon

River basins, accounting for 27.6 percent and 13.5 percent of total water use in Mongolia, respectively (2030 Water Resources Group, 2016).

The territory of UB belongs to Tuul and Kharaa river basins. The water supply of UB, where about 47 percent of the national population lives, is mainly sourced from the upper reaches of the Tuul River basin. The estimated usable groundwater resources of the Tuul River basin are approximately 641 million cubic meter per year, whereas surface water resources are approximately 1.59 billion cubic meters per year (MEGD, 2012).

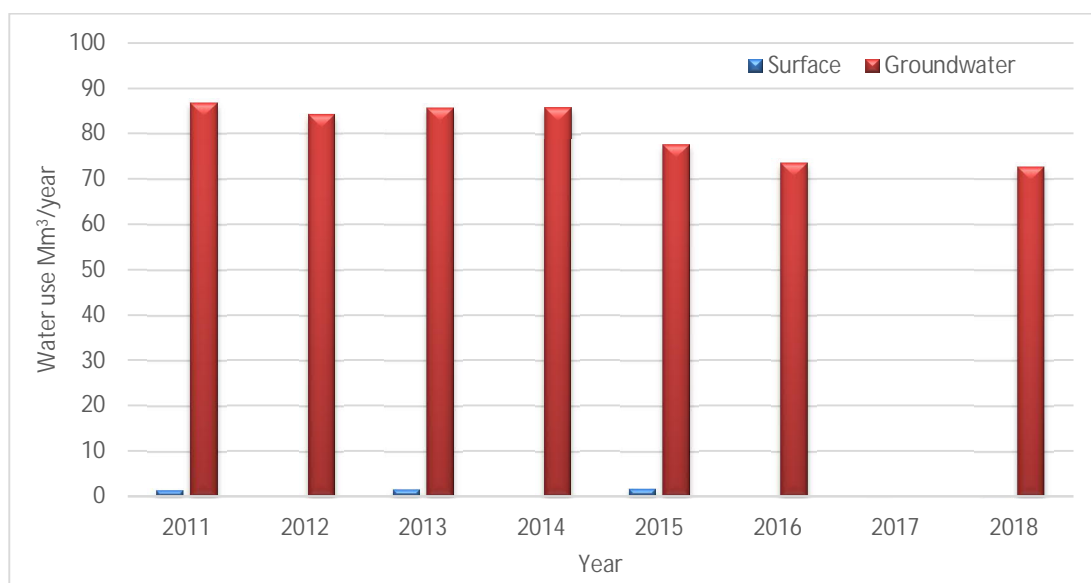
A number of hydrogeological studies were conducted in the vicinity of UB city from 1956 to 2015 to assess groundwater sources and develop groundwater wellfields. For instance, during the periods from 1977 to 1979 and 1983 to 1984, the Project Scientific Research Institute of Engineering Building, a scientific institute of the former Soviet Union, completed comprehensive hydrogeologic investigations to identify centralized water-supply sources to satisfy current and future water demands for UB city (AECOM, 2019a). During the investigations, potential approvable groundwater resources at several sites were evaluated and compared, and as a result seven wellfields were developed. Groundwater production from these and other wellfields contributing to the UB water supply is summarized in Table 8-5.

**Table 8-5 Groundwater Production (Annual Average)**

Source	Number of Wells	Average Diameter of Wells (mm)	Average Capacity of Wells(l/sec)	Production Rates of Wellfields	
				Million m³/year	m³/day
USUG					
Upper	55	300	25.0	18.7	51,200
Gachuurt	21	256	16.5	1.8	4,900
Central	88	327	18.1	21.8	59,700
Makh	11	300	29.3	4.0	11,000
Uildver	16	396	33.0	7.9	21,600
Nisekh	20	273	18.6	1.0	2,700
Yarmag	2	6,000	58.3	0.05	140
Subtotal	213			55.3	151,240
Ministry of Energy					
CHP 2	6			2	5,500
CHP 3	18	426	44.4	9	24,700
CHP 4	12			10	27,400
Subtotal	36			21	57,600
Total	249			76	208,840

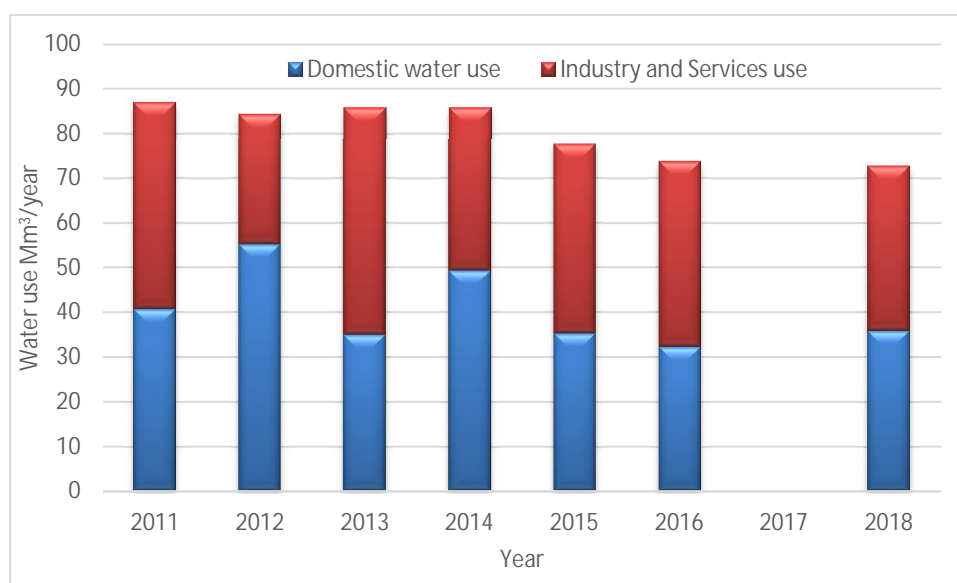
As illustrated in Figure 8-3, about 90 percent of water use is supplied from the groundwater resources. In 2018, UB consumed 72.67 million cubic meter per year in total, of which 99 percent was withdrawn from ground water resources and 0.02 million cubic meter per year used from surface water resources<sup>62</sup>.

<sup>62</sup> <http://www.eic.mn/box/search>



**Figure 8-3 Surface Water and Groundwater Use**

Water consumers in UB are classified into two types: domestic and commercial. The amount of water supply for domestic and commercial consumption over the past 7 years in UB is illustrated in Figure 8-4<sup>63</sup>.



**Figure 8-4 Water Consumption in UB**

Economic sectoral water use in UB during the period from 2011 to 2018 is shown in Table 8-6. The power sector is the largest commercial water consumer in UB<sup>64</sup>.

<sup>63</sup> <http://www.eic.mn/box/search>

<sup>64</sup> <http://www.eic.mn/box/search>



Table 8-6 Sectoral Water Use in UB

Sector (million cubic m/year)	2011	2012	2013	2014	2015	2016	2017	2018
Animal husbandry	1.4	1.4	1.66	1.57	1.80			
Crop farming	4.11	4.32	3.56	3.73	3.17	4.01		3.02
Mining	4		0.13	0.05	0.04	0.04		0.04
Processing industry	14.09		21.64	0.31	15.4	16.3		0.81
Power	21.4	18.37	24.07	25.8	18.89	19.5		19.11
Tourism								
Greenery and environmental needs	2.41	4.36	0.67	4.28	4.28	1.49		1.99
Other sectors		0.6	0.6	0.6	0.43			11.61

MET has encouraged water protection and conservation initiatives in recent years, especially wastewater treatment, and recycling and re-use of grey water. Thus, from 2013 to 2016 re-use of grey water increased sharply as shown in Figure 8-5<sup>65</sup>.

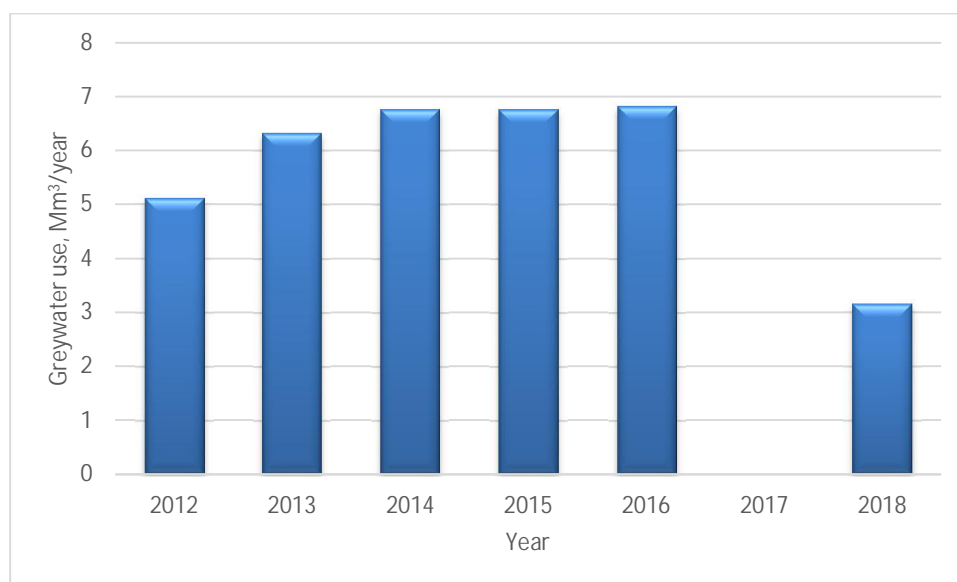


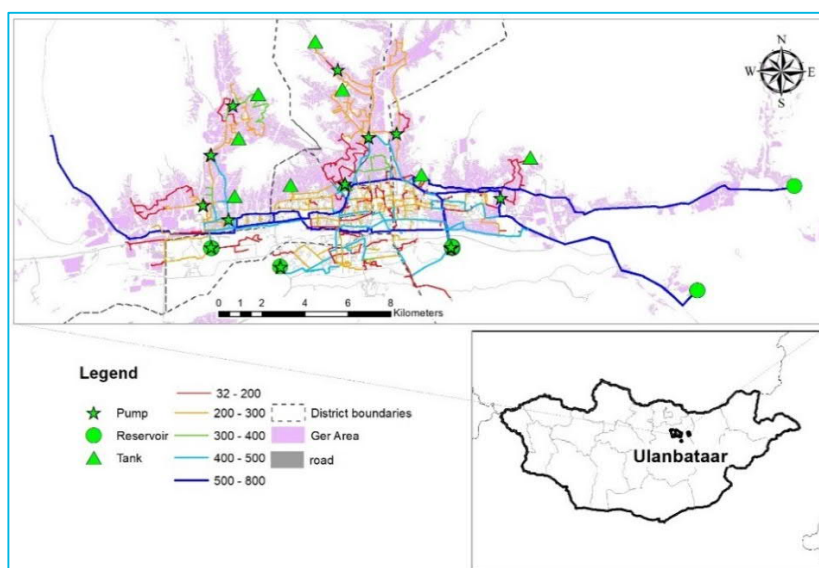
Figure 8-5 Greywater Re-Use

The current infrastructure of the UB water supply system and its locations are shown in Table 8-7 and Figure 8-6.

Table 8-7 Elements of Existing Infrastructure

Element	Total Number	Active
Pipes	2469	2431
Pipe Length (m)	398,750	379,730
Junctions	2103	2070
Tanks	9	9
Reservoirs	10	10
Pumps	44	44
Source: BWSE Project Hydraulic Model Analysis		

<sup>65</sup> <http://www.eic.mn/box/search>



**Figure 8-6. Infrastructure of the UB Water Supply System**

UB has been the engine of Mongolia's urbanization. Economic growth is increasingly concentrated in the capital with about 47 percent of the total population generating more than 60 percent of the country's GDP, and accounting for 50 percent of its total investment (Byambakhuu et al., 2016). The rapid urbanization in UB has led to other environmental impacts in addition to air pollution, particularly water shortage.

Considering future uncertainties, the water demand gap for UB has been assessed based on three development scenarios that is low, medium and high economic development. UB, the capital of Mongolia and the largest city in the country, is facing water shortage and sanitation shortfalls, which are key constraints to economic growth and poverty reduction (2030 Water Resources Group, 2016). Based on the future projections and scenarios of various studies, MCC determined that the projected increase in water demands in UB will exceed current production capacity in the near future, as shown in Figure 1-1 of Section 1.1. This led to the BWSE project formulation that constructing new wells and related facilities and buildings, and identifying new wellfields were essential to meeting UB's future water supply demands (AECOM, 2018a).

## 8.2.2 Water Supply and Operation

As mentioned in Section 8.3.2, the water consumers in UB are classified into two types: domestic and commercial. Currently groundwater sourced from seven wellfields operated by USUG is used mainly for domestic and commercial purposes of UB (see Table 8-5).

The water supply service for UB city is the responsibility of USUG and the Housing and Public Utilities Authority of UB City and comprises both piped network and trucked services. The mission of USUG is to manage the operation and maintenance of water supply and wastewater systems, including the wastewater treatment plants in the City. This includes identifying the sources of supply and extracting water, treating it to the desired quality levels, and storing and pumping the water in the main water supply network of the City.

USUG provides 150,000 cubic meters per day of fresh water to residences and industries in UB and 100 percent of the connections are metered. The water supply distribution network and its infrastructure elements are shown in Table 8-7. Almost all commercial buildings and apartments have piped water connections. Ger residents are provided for either through pipe-supplied or truck-supplied water kiosks (2030 Water Resources Group, 2016).

USUG maintains the central water supply and wastewater networks, with which it supplies the Housing and Public Utilities Authority and some bulk users, such as selected industries. The Housing and Public Utilities Authority further maintains the water supply and wastewater networks through more than 170 Community Transmission Centers to service apartments, industries and other water users. Virtually all industries are connected to either the USUG or Housing and Public Utilities Authority networks, but some industries also abstract groundwater via private wells. Between November and June, all industries are dependent on water from the distribution networks as groundwater levels fall to 7 meters below surface, a net fall of 4 meters, which is out of reach for their wells (2030 Water Resources Group, 2016).

UB has one Central Wastewater Treatment Plant (CWWTP), with a design capacity of 230,000 cubic meters per day. The plant receives an average of 160,000 to 200,000 cubic meters of wastewater per day, performing mechanical biological treatment and disinfection with chlorine and ultraviolet light, and discharges the effluent to the Tuul River (2030 Water Resources Group, 2016).

Power, heat and hot water are currently supplied by three Combined Heat and Power Plants, namely plants No.2, No.3 and No.4. The older plants No.2 and No.3 have both been operated by the Ministry of Energy for approximately 40 years. Plant No.4 is the biggest coal-fired combined heat and power plant in Mongolia and covers 70 percent of the total power demand and 64 percent of the total heat demand of the district heating system of UB. The plant was built over 30 years ago and many upgrades and repairs have been done in recent years.

The heating season goes from September 15<sup>th</sup> to May 15<sup>th</sup> each year, while hot water is provided year-round. The UB City Heating Company is responsible for the central heating grid and transfers heat from the combined heat and power plants to the pumping stations and sub-stations of the Housing and Public Utilities Authority, as well as to another 9,000 buildings. The Housing and Public Utilities Authority has 143 stations and 300 sub-stations across the city for receiving water and heat from USUG and the UB City Heating Company. These sub-stations have heat exchangers where cold water is heated to 70 °C and circulated to apartments. The Housing and Public Utilities Authority supplies hot and cold water to 70 percent of residents of UB. Figure 8-7 shows heat circulation in a closed loop system (2030 Water Resources Group, 2016).

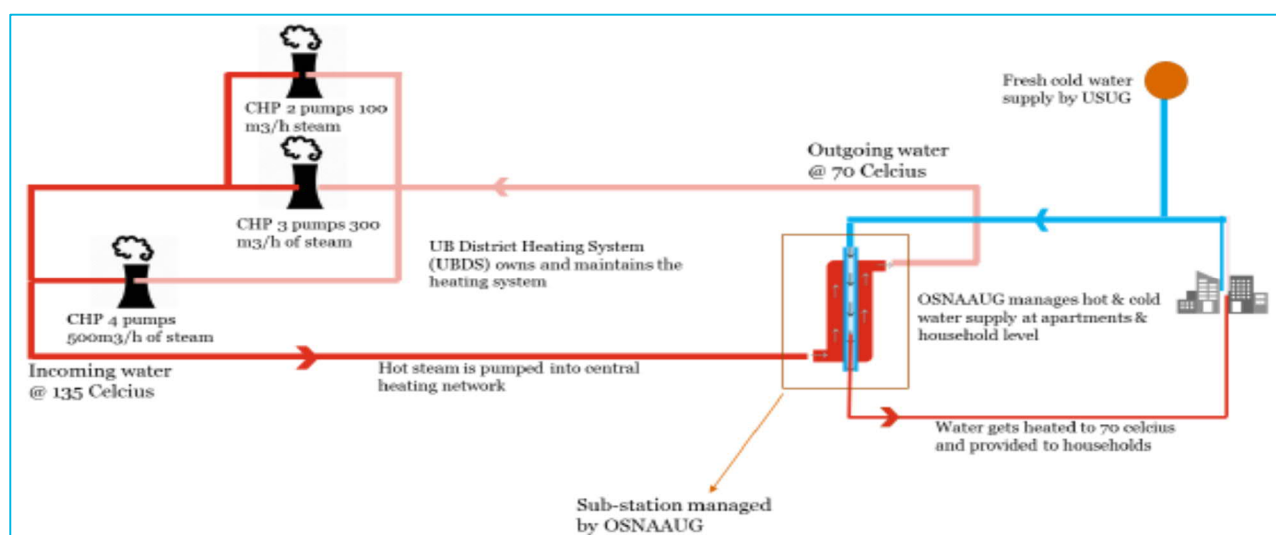


Figure 8-7 Heat and Hot Water System in UB

## 8.2.3 Potential Climate Change Impacts on Project Components

Climate change is an important factor for any project. The quality and quantity of the water supply and water infrastructure associated with the project may be impacted by climate change. Table 8-8 displays potential impacts and vulnerabilities of water supply and water infrastructure identified by USAID in its climate risk screening tool (USAID, 2017). While this list is somewhat general, many of the potential impacts and vulnerabilities are particularly relevant to the BWSE project. These are discussed in the following paragraphs.

### Impacts to Water Quantity

Higher temperatures, changes in precipitation patterns towards more intense rainfalls, and increased urbanization of the UB region, with associated increase of impermeable surfaces, will lead to reduced aquifer replenishment through direct vertical infiltration. This in turn may affect groundwater levels along the Tuul River aquifer. The location of the Biokombinat and Shuvuun wellfields, the downstream wellfields as they were called during the feasibility study for this project, was a bold choice made, in part, to mitigate this risk. The location presents numerous advantages with respect to upstream wellfields in terms of water quantity:

- The catchment recharging the proposed wellfields is large (9,140 square kilometers), contributing large amounts of water to sustain the aquifer.
- The proposed wellfields are downstream of the urbanized areas of UB, meaning that there is space for the runoff from the city to recharge the aquifers, at least in part. Discharges to the Tuul River from the city, including the effluent discharge from the new CWWTP, which will discharge continuously through the year, will also contribute to aquifer recharge.
- The water bearing layer at the proposed downstream wellfields is much deeper than at the existing upstream and central wellfields. Most of the wells would be drilled to 60 meters without hitting bedrock, compared to a water bearing layer upstream of UB that ranges from 18 to 23 meters in depth. This would allow pumps to be placed well below the phreatic surface, and so would be less affected by seasonal fluctuations or long-term changes in groundwater levels. In the worst of circumstances, where there is a sufficient drop in water levels to cause cavitation at the pumps, the pumps could be dropped down further along the well to be in the water bearing part of the aquifer.

### Impacts to Water Infrastructure

Constructing in an active floodplain will always bring with it flood risk and the associated risk of damage to structures and infrastructure. With this in mind, and in line with international best practice and Mongolian requirements, flood protection measures are included in the design of the BWSE to protect against a statistically defined 100-year flooding event. A 100-year event is an acceptable compromise between long term protection and investment in flood protection. Where human lives are at risk, for example, a larger, statistically less likely event such a 500-year or 1,000-year event would be used in design.

The trends in climatic change would indicate that precipitation events will be more intense but the total volumes will change little. This, in combination with larger urbanized, less permeable areas in and around UB, may lead to an increase in the runoff-to-infiltration ratio in the city and the Aol. Downstream, impermeable areas within the Tuul River floodplain, unless already saturated, could attenuate the runoff problem, which in turn would contribute to aquifer recharge.

The proposed embankments in the floodplain, built to protect transmission lines from freezing in winter, have been sized so as not to be overtopped by the aforementioned 100-year event, thus protecting from scouring by floodwaters, while armored openings in the embankments would allow floodwaters to flow downstream, precluding increased flood levels.

## Impacts to Water Quality

Harmful algal blooms that produce toxins leading to human health impairment may be caused by higher temperatures. Water quality may be affected by more pathogens and lower dissolved oxygen caused by higher water temperatures, especially considering that the new CWWTP outfall will be upstream of the proposed wellfields, as is the outfall of the existing CWWTP. As a result of higher temperatures and flooding, incidence of waterborne infectious diseases may grow, which could contaminate groundwater abstracted from the proposed boreholes. Flooding could increase the amount of suspended solids in raw water, potentially including contaminated Tuul River sediments, thus increasing the cost or decreasing efficiency of water treatment processes. In addition, the ability of the Tuul River to dilute and carry away contaminants may be reduced due to increased low-flow periods.

Water quality, however, has been a key criterion in the development of the BWSE. The AWPP is sized on the basis of worst-case scenarios, themselves developed using water quality data collected in the field. The design recognizes that the Tuul River aquifer is under the direct influence of surface water and the necessary protective measure are in place to guarantee high quality treated water.

**Table 8-8 Potential Impacts and Vulnerabilities of Water Supply and Water Infrastructure**

<b>Impacts to Water Quantity</b>	Increased evaporative water losses due to higher temperatures.
	Increased demands for potable water and for other uses of water due to higher temperatures.
	Decreased water availability in the dry season due to rapid runoff and reduced infiltration caused by heavy rainfall over sparsely-vegetated/increasingly impermeabilized watershed.
	Potentially diminished seasonal water supply due to climate change impact.
	Increased competition for water to meet rural and urban needs due to drought and water shortages.
	Reduced surface water availability and groundwater recharge due to prolonged dry periods and droughts
	Increase in production wells drying up due to declining recharge of aquifers caused by longer dry periods and increased surface runoff during rains.
<b>Impacts to Water Infrastructure</b>	Damage to water supply and sanitation infrastructure due to flooding.
	Increased damage to water supply systems, including collection, treatment, and distribution systems, due to increased intensity of precipitation.
	Damage to water and sanitation infrastructure due to changes in soil freezing patterns and permafrost in wellfields.
	Disruption to supply chains for construction and maintenance of water and sanitation infrastructure due to flooding and/or severe events.
<b>Impacts to Water Quality</b>	Harmful algal blooms that produce toxins leading to human health impairment may be created by higher temperatures.
	Reduced water quality due to increased pathogens and lower dissolved oxygen caused by higher temperatures.
	Increased incidence of waterborne infectious diseases due to higher temperatures and flooding.
	Contaminated groundwater through boreholes and unprotected wells due to flooding.
	High levels of contaminated Tuul River sediments may result in the potential contamination source for groundwater and it may impact costs or efficiency of water treatment processes
	Reduced ability of Tuul River to dilute and carry away contaminants during increased low-flow periods.
<b>Behavioral Change and Enabling Environment</b>	Reduced resources available for community education as a result of resources required for emergency response.
	Reduced resources for and enforcement of government policies and regulations related to water use due to diversion of government staff and resources to address extreme events and other climate impacts.



Design measures that improve resilience to climate change: As noted in the previous paragraphs, it is expected that climate change will impact water quantity, water infrastructure, and water quality. It should be clearly stated that climate change projections were not considered when modelling data to determine design parameters and criteria. However, best engineering practices call for safety factors generally, and more stringent safety factors in the face of uncertain risk, that implicitly improve the resilience to climate change of a design. Some examples:

- The location of the wellfields downstream of UB and the CWWTP outfall was selected to limit impacts on flows in the Tuul River. This choice brings greater aquifer depth and more recharge than central and upstream wellfields, providing more resilience to impacts on water quantity.
- The inclusion of redundant wells was done in accordance with Construction Code of Mongolia CCM 40-02-16, *Water supply: Pipeline networks and facilities*. This requirement implicitly increases climate change resilience with respect to impacts on water quantity (enabling operating additional wells if necessary), water infrastructure (redundancy in wells per se), and water quality (enabling switching off contaminated wells without too much impact on wellfield production).
- The design of the AWPP, with technologies sized on worst case scenarios of contamination from CWWTP into groundwater under the influence of surface water, provides for a robust yet flexible treatment facility that can deal with expected and unexpected contamination; thus, implicitly increasing the climate change resilience of the project with respect to impacts on water quality.
- The design of a freeboard for well pumphouses of 1 meter above a 100-year flood event was included in the design to protect the structures in accordance with Mongolian requirements and international best practice. While the flood modelling did not account for climate change projections, the 1-meter freeboard implicitly provides resilience to impacts on water infrastructure caused by increased flooding due to climate change.

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## 9. Cumulative Impact Assessment

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### 9.1 Introduction

The BWSE project would be implemented downstream of UB, as discussed in Section 5. This Section presents a cumulative impact assessment (CIA) for the BWSE project, including details of the definition, applicable guidance, methodology, scoping, and impact assessment.

The CIA of the BWSE project needs to be considered in conjunction with the potential impacts from other future developments or activities that are planned and reasonably defined and are located within a geographical scope where potential environmental and social interactions could act together with the Project to create a more (or less) significant overall impact.

In addition to this, the CIA takes account of planned (i.e. consented) projects and projects which are at an advanced stage in the planning process in the downstream vicinity of UB.

#### 9.1.1 Definition

Cumulative impacts would occur when activities of a proposed project act together with activities of other planned projects to impact the same environmental or social resource or receptor. As defined by IFC PS1 *“Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.”*

#### 9.1.2 Guidance and Methodology

The CIA of the BWSE project thus needs to be considered in conjunction with the potential impacts from other future projects or activities that are planned and reasonably defined and are located within a geographical scope where potential environmental and social interactions could act together with the Project to create a more (or less) significant overall impact.

The methodology to the present CIA is based on the international best practice provided by IFC and its associated guidance. In other words, this Section has adopted the six-step CIA approach defined in the IFC Handbook - Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (IFC, 2013). Central to the IFC approach of CIA is the concept of valued environmental and social components (VECs). The IFC defines VECs as “environmental and social attributes that are considered to be important in assessing risks (IFC, 2013); they would be:

- physical features (e.g., living and non-living environmental components);
- environmental processes (e.g., water and nutrient cycles, microclimate);
- ecosystem conditions (e.g., biodiversity);
- social conditions (e.g., local communities and economics), and
- cultural aspects (archeological sites, etc.).

Figure 9-1 explains the six steps of the IFC approach to CIA, which is an iterative process consisting of the following steps:

- Step 1: Identify VECs, spatial and temporal boundaries;
- Step 2: Identify the other activities and environmental drivers;
- Step 3: Establish information on the baseline status of VECs;
- Step 4: Assess cumulative impacts on VECs;

- Step 5: Assess the significance of predicted cumulative impacts; and
- Step 6: Management of cumulative impacts – design and implementation.

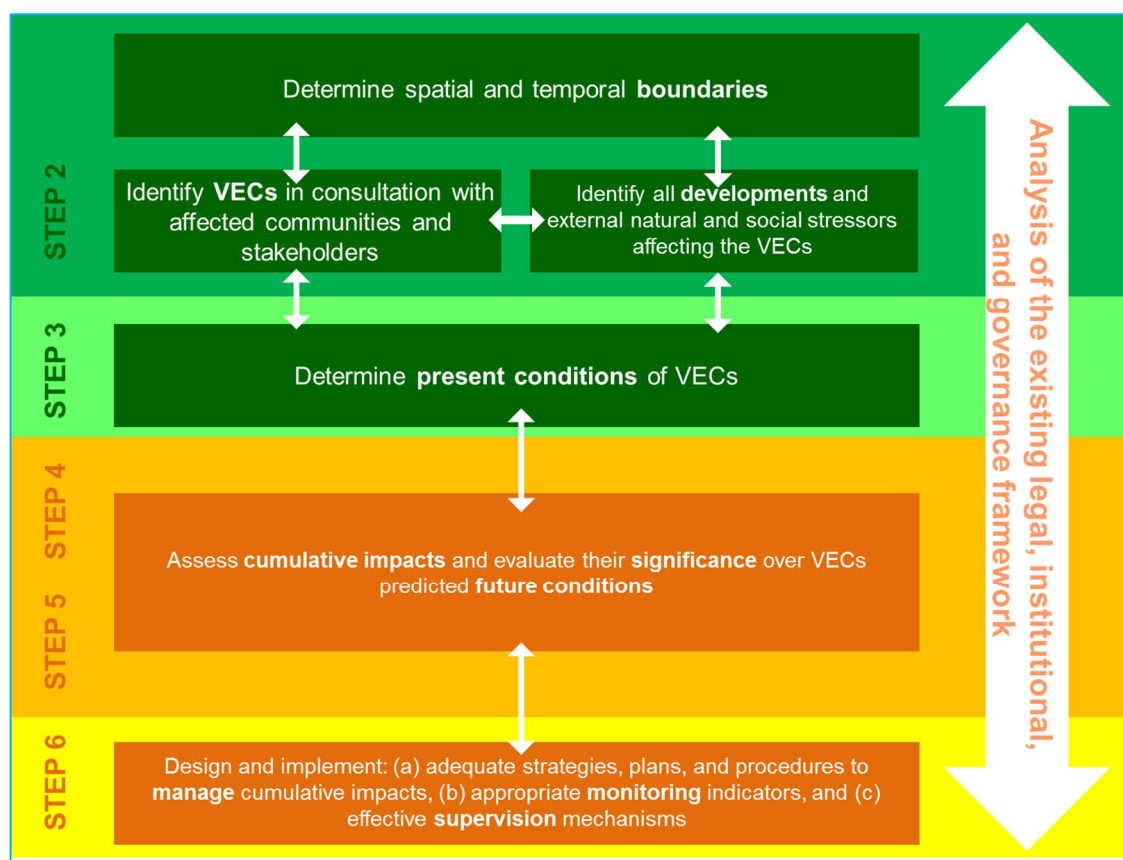


Figure 9-1 Rapid Cumulative Impact Assessment Methodology

## 9.2 Identification of VECs, Spatial and Temporary boundaries

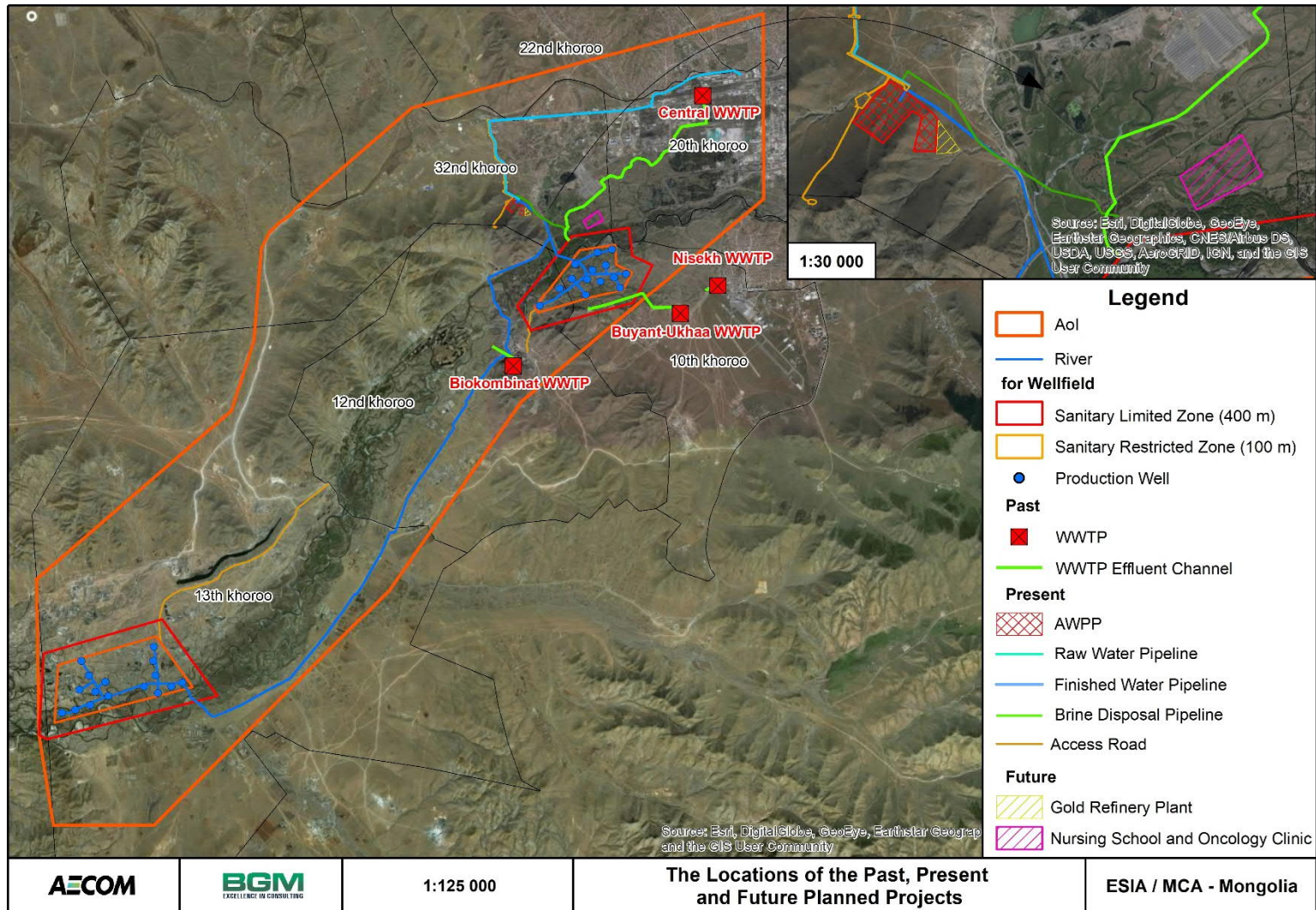
### 9.2.1 Spatial and Temporal Boundaries

Boundaries for CIA analysis need to encompass the geographic and temporal extent of impacts (from other past, present and future planned developments) that influence VEC condition throughout the time period during which project impacts would occur (IFC, 2013).

The CIA of the BWSE project thus needs to be considered in conjunction with the potential impacts from other past, present and future developments that are planned and reasonably defined and are located within a geographical and temporal extent where potential environmental and social interactions could act together with the project to create a more (or less) significant overall impact (see Figure 9-2).

The spatial boundary is the geographical area impacted by the projects and their associated facilities and cumulative impacts. The AoI of the BWSE project would be included in this geographical area (IFC, 2013). In addition to this, the past, present, and future planned projects would impact defined VECs in the AoI of the BWSE project.

The temporal boundary is the timescale over which a project is likely to have impacts. In order to define the temporal boundary of the CIA, VECs are described based on whether they would be impacted by the BWSE project activities during the pre-construction, construction and operation and maintenance phases.



**Figure 9-2 The Locations of Past, Present and Future Planned Projects**



## 9.2.2 Identification of the VEC

As discussed in Section 7, the ESIA report considers the potential impacts on environmental and social receptors (e.g. VECs). These VECs have been defined by taking into account the existing environmental and social conditions in the Aol of the BWSE project. Public consultation with relevant stakeholders has been a key component of the environmental and social resource identification process, as discussed in Section 4. In addition to this, soil cover has been damaged due to many gravel mining activities along the Tuul River's northern floodplain in Shuvuun area, where proposed Shuvuun wellfield would be constructed as mentioned in Section 6.1.7.7. As discussed in Sections 6.1.9.1 and 6.1.9.2, the CWWTP performs poorly, discharging partially treated wastewater to the Tuul River and causing surface and groundwater pollution downstream of the river outfall. In addition to the CWWTP, there are comparatively small wastewater treatment plants that also discharge to the Tuul River.

The summary of VECs that have been considered within this ESIA Report, and thus within this CIA, comprise the following:

- Humans (local communities, local economy, etc.);
- Environmental components, both living (habitat, flora, fauna, etc.) and non-living (air quality, water bodies, landscapes, etc.), and;
- Cultural heritage components (archeological sites, etc.).

However, according to the IFC guidance note, this CIA considers those VECs that would be impacted by the BWSE project with any degree of residual impact. Therefore, VECs for which there is residual impact significance that is deemed to be Negligible do not need to be included and would be scoped out of this CIA. Where the residual impact significance of the BWSE project is defined to be moderate or high, the applicable VEC is scoped into the CIA. Residual impacts defined as low have been subject to further evaluation in order to see if there is potential for cumulative impacts to be generated. Table 9-1 presents a summary of the residual impact assessment as reported in Section 7 and identifies the residual impacts significance on defined VECs during the pre-construction, construction and operation and maintenance of the BWSE project.

**Table 9-1 Summary of the BWSE Project Residual Impact Significance**

Section	VEC	Pre-construction: Residual impact significance	Construction: Residual impact significance	Operation and Maintenance: Residual impact significance
<b>Section 7.4</b>	Soils	Negligible to Low	Low	Low
<b>Section 7.5</b>	Air	Low	Low	Low
<b>Section 7.6</b>	Water	Negligible	Low	Negligible to Low
<b>Section 7.7</b>	Biodiversity	Negligible to Low	Low to Moderate*	Negligible to Moderate*
<b>Section 7.9</b>	Human receptors	Negligible to Moderate	Negligible to Moderate	Negligible to Moderate**
<b>Section 7.9</b>	Culture heritage	Negligible to Moderate	Negligible to Moderate	Negligible to Moderate
<b>Section 7.9</b>	Waste	Negligible to Moderate	Negligible to Moderate	Negligible to Moderate
* <i>only for Mongolian Marmot habitat</i>				
** <i>The majority of the impact on households is very small, with most households in the Khan-Uul resettlement area who will lose only a narrow strip of land along their frontages - some of which they do not own. The RAP for SKhD not finished and so impact is not final but is expected to be similar in type, if not number.</i>				



## 9.3 Cumulative Impacts Assessment

This section defines the existing, planned or reasonably defined projects in the vicinity of the BWSE project and the potential cumulative impacts of those projects together with the BWSE. If the BWSE project is able to interact with these existing, planned or reasonably defined projects temporally and spatially, the BWSE project would exert potential cumulative impacts in the downstream vicinity of UB. During the stakeholder meetings, information on these developments was obtained from local and governmental organizations, and third parties (e.g., Erdenes Alt Resource LLC).

### 9.3.1 Existing, Planned or Reasonably Defined Projects

MCA-Mongolia would implement a wastewater recycling project. The wastewater recycling plant activity supports the recycling and reuse of a large quantity of wastewater effluent (e.g., 50,000 cubic meters per day) from the CWWTP through the construction of a wastewater recycling plant, pumping stations and associated pipelines to convey the recycled water to water storage facilities near combined heating and power plants and internal piping, storage facilities, and control systems to facilitate the use of recycled wastewater for certain processes at combined heating and power plants 3 and 4.

From the information provided by “Erdenes Alt Resource” LLC and the resolution of Citizen’s representative council of Songinokhairkhan district with order number 11/01, a gold refinery and “nursing school and oncology clinic” would be developed in the Aol of the BWSE project. At the time of writing, AECOM was not able to estimate a timeline for these planned projects. However, it would be assumed these project will be developed in the near future.

The gold refinery project would be constructed at a site adjacent to the proposed AWPP site of the BWSE project. A feasibility study for the project has been approved by the Refinery sub council of the Minerals Professional Council on September 9<sup>th</sup>, 2019 (CTP/19-01-01). The latest green technology for gold refineries, approved by the Euro-Asian Patent Committee, “Precious metal refinery innovative technology” was incorporated in the feasibility study<sup>66</sup>. This project is being implemented under strictly enforced rules and regulations of State and official secrecy laws and project procedures. Thus, construction and operation times are not known.

The nursing school and oncology clinic would be located on southeast side of the proposed AWPP site of the BWSE project. Here also, construction and operation times are not known at the time of writing.

A hydropower pumped storage plant would be constructed near the proposed AWPP site. This project is anticipated to produce electricity by releasing the stored water in upper reservoir, pumped there from another reservoir at a lower elevation. The water source to be used under this project is planned to be supplied from the CWWTP outfall discharge which currently discharges to the Tuul River. At the time of writing, AECOM would not able to estimate a timeline for the construction and operation phase of this anticipated project.

### 9.3.2 Assessment of Cumulative Impacts

Section 9.3.1 defined the existing, planned or reasonably defined projects in the vicinity of the BWSE project. The CIA has accounted for existing, planned or reasonably defined project features (e.g., distance from the BWSE project activities and other project activities footprint) in

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<sup>66</sup> Official letter from Ministry of Mining and Heavy Industry on October.02 of 2019

order to determine the potential residual impact significance to generate cumulative impact during project implementation phases.

It is important to note that IFC's rapid CIA methodology takes into consideration the limitations that a private sector financial institution may face carrying out this type of analysis, including limited baseline information on VECs, the uncertainty associated with anticipated developments (e.g., incomplete information about other projects and activities), limited government capacity, and absence of strategic regional, sectoral, or integrated resource planning schemes (IFC,2013).

As mentioned in Section 9.3.1, AECOM would not able to estimate a timeline for these planned projects. However, it would be assumed these project will be developed in the near future. In addition to this, information about these existing, planned or reasonably defined developments is still lacking or incomplete (e.g., design information, the information is not available in the public and etc.).

Section 9.2.2 defined the VECs and the residual impact significance that need to be considered as part of the CIA on the basis of a moderate residual impact significance. However, in this part some VECs are considered that experience a low residual impact, as detailed in Table 9-1, where the potential for cumulative impacts warrants further consideration due to the sensitivity / importance of affected VECs in the vicinity of the BWSE project. Depending on currently available data or information of the existing, planned or reasonably defined projects, if a cumulative impact risk is identified, the significance of the potential cumulative impact is either quantified or qualified in Table 9 2.

**Table 9-2 The BWSE Project VECs which could Experience a Cumulative Impact as Associated with Future Projects**

VEC	Wastewater Recycling Plant	Gold Refinery Plant	Nursing School and Oncology Clinic	Hydropower Storage Plant <sup>67</sup>
<b>Soils</b>	x	✓ Construction phase only*	x	✓ Construction phase only*
<b>Air Quality</b>	x	✓ Construction and operation phase*	x	✓ Construction and operation phase*
<b>Tuul River surface water</b>	✓ Construction phase only*	x	✓ Construction phase only*	✓ Construction and operation phase*
<b>Biodiversity features (flora and fauna)</b>	x	✓ Construction phase **	x	✓ Construction phase**
<b>Noise and Vibration</b>	x	✓ Construction and operation phase*	x	✓ Construction and operation phase*
<b>Local communities</b>	x	✓ Construction phase only*	x	✓ Construction phase only*
<b>Culture heritage</b>	x	✓	x	✓

<sup>67</sup> Hydropower Storage Plant project includes two sub-projects, namely the Tuul-Gobi project and Waste water treatment project. The Tuul-Gobi project plans a water source to be supplied from the CWWTP outfall discharge, which currently discharges to the Tuul River. The waste water treatment project is to clean the CWWTP outfall discharge before using it for hydropower storage project. However, GoM is now upgrading CWWTP with foreign loan. Thus, the waste water treatment project under hydropower storage project would not implemented. In addition to this, no feasibility study and design available for these project at this time.

VEC	Wastewater Recycling Plant	Gold Refinery Plant	Nursing School and Oncology Clinic	Hydropower Storage Plant <sup>67</sup>
		Construction phase ***		Construction phase ***
Waste Management	x	Construction and operation phase*	x	x
<b>x-no impact</b> <b>✓- impact</b> <i>* If construction (and operation) phase is overlapping between the BWSE project and other projects</i> <i>** If construction and operation phase is overlapping between the BWSE project and other project then cumulative impact would generate to Mongolian Marmot habitat</i> <i>*** If construction and operation phase is overlapping between the BWSE project and other project then cumulative impact would generate to archeological sites.</i>				

### 9.3.3 Assessment Residual Impact Significance

It is important to note that the detailed environmental impact assessment (DEIA) will be carried out for all existing, planned or reasonably defined projects according to Mongolian environmental impact assessment law. Thus, potential impacts from these projects for environmental components, social-economic components, and cultural aspects would be analyzed during each DEIA based on comprehensive information in terms of approved design or feasibility studies and public consultation activities.

The future planned projects have potential impacts to environmental components (e.g., living and non-living components) in the vicinity of the BWSE project. Presumably, the potential impacts from existing, planned or reasonably defined project activities on environmental components could occur at the site scale and over a temporary, short-term duration (i.e., limited to construction phase). However, residual impact significance would be minimized through the implementation of various protection and mitigation measures or best engineering practices as described in each DEIA.

Therefore, this section presents only potential cumulative impacts from these projects. As summarized in Table 9-1, Sections from 7.4 to 7.7 reports that the residual impact significance on soils, air quality, Tuul River surface water and biodiversity features are all predicted to be negligible or low during all BWSE project phases, with impacts generally occur at site scale and short-term duration. However, the residual impact significance for fauna (e.g., Mongolian Marmot habitat) is predicted to be moderate.

This indicates that the BWSE project's ability to cause cumulative impacts on soils, air quality, Tuul River surface water, and biodiversity features (e.g., flora) with other existing, planned or reasonably defined projects in the vicinity would be very limited, except for Mongolian Marmot habitat.

The following points are made with regard to the potential for cumulative impacts to VECs (e.g., environmental components including living and non-living components):

**Soils:** The BWSE project, gold refinery, and hydropower pumped storage plant will have the potential to impact upon soil resources. They will adopt a range of best engineering practices and mitigation measures to limit the impacts associated with land clearance and earthworks, accidental leakages and spillages. In addition, the areas collectively impacted are also spatially limited to the development of footprints, which are small when compared to the local soil resource. On this basis, no residual impacts significant to cumulative impacts on soils are anticipated with respect to the concurrent developments of these projects. Additionally, no residual impact significant to cumulative impacts on soils are anticipated during the operational phase given that all project impacts are predicted to be negligible.

**Air quality:** The BWSE project, gold refinery, and hydropower pumped storage plant will have the individual potential to impact air quality. Furthermore, they will adopt a range of best engineering practices and mitigation measures to avoid and reduce potential cumulative impacts associated with project-level greenhouse gases and dust emissions due to construction works. For example, some access road used by the BWSE project vehicles could be used by vehicles associated with Gold refinery plant, and Hydropower storage plant during the construction phase. However, given that these project locations will have a negligible magnitude on changes to air pollution at nearby receptors indicates that there would be less opportunity for cumulative air pollution impacts generated by vehicles. Thus, no residual impact significant to cumulative impacts on air quality are anticipated during the construction and operation phases.

**Tuul River surface water:** The BWSE project and Wastewater recycling plant will have the potential to impact to Tuul River surface water due to construction and installation works of pipelines. Presumably, the pipeline route for crossing the Tuul River will be at different locations due to the current locations of these projects. On this basis, no residual impact significant cumulative impacts on Tuul River surface water are anticipated during the construction and operation phase.

**Biodiversity features:** The BWSE project, gold refinery, and hydropower pumped storage plant will have the potential to impact biodiversity features in their vicinity. Residual impacts significant to cumulative impacts on flora are not anticipated during the construction and operation phases of these projects. However, given these project locations, Mongolian Marmot habitat could be cumulatively impacted due to the construction works of these projects. The magnitude of the impacts from potential impacts of projects could be different due to the distance between project locations and Mongolian Marmot habitat. Furthermore, the projects will adopt a range of best engineering practices and mitigation measures to avoid and reduce potential cumulative impacts to Mongolian Marmot habitat associated with construction works, accidental leakages, and spillages. Therefore, no significant cumulative impacts on Mongolian Marmot habitat are anticipated with respect to the concurrent development phases of these projects.

**Local communities and Waste:** Mongolia has made progress in terms of economic development. The implementation of the project will but contribute to such improvement through long term benefits that would come from the availability of clean water for the residents of UB. Not only will citizens drink clean and potable water, but also small scale businesses such as in the agriculture sector will be able to expand their production. The expansion of the water supply contributes to social progress and wellbeing.

Nevertheless, the construction and operation of the project in a social context with limited access to socioeconomic institutions and scarcity of resources engender competition. The individuals with social assets, including social networks, are able to control available resources using practices with adverse ethical effects, such as corruption. The BWSE project brings substantial resources to the community that may trigger competition for control over resources.

### **9.3.4 Risks Associated with Existing, Planned or Reasonably Defined Projects**

**Regarding the gold refinery plant:** Information about the gold refinery plant development at a site adjacent to the AWPP site is limited to a letter from the Ministry of Mines and Heavy Industry, indicating chemicals that will be used at the development, and a letter from the developer,

Erdenes Alt Resources LLC, indicating the chemicals used and residuals management plans at the proposed gold refinery plant<sup>68</sup>.

The chemicals and materials to be used at the gold refinery plant represent the chemicals of common usage across industrial processes, including water and wastewater treatment. There is clear guidance and legislation on handling and disposing of these chemicals; it is assumed that these standards practices will be applied given the transparency of the operator in sharing this information.

If a spill were to occur, and the spilled waste entered the river or groundwater, theoretically it could impact the AWPP, although dilution with non-contaminated water during conveyance would mitigate that impact. Fortunately, the advanced processes at the AWPP are designed for the purpose of removing a host of “unknown” pollutants.

Plant residuals handling at the gold refinery, as described in the two documents available to AECOM at the time of writing, include liquid waste from treatment plant, solid waste from treatment, and treated gas.

If they follow the treatment/reuse plan as described in the documents, there is no risk to AWPP or wellfields because in principle there are no discharges to the river. In other words, it is not like a WWTP, which has an effluent outfall to receiving water, vulnerable to the efficacy of the WWTP unit treatment processes.

The gold refinery will collect, treat, and recycle its waste. Only small volumes of residuals are to be hauled off-site. Gas residuals are scrubbed and treated before release to the atmosphere. Of course, a gas release before scrubbing could pose risk to AWPP employees as well as the gold refinery employees.

However, it is estimated as low risk to staff and processes at AWPP, since all unit processes and staff work areas are contained indoors. Air intakes and louvers obviously could draw in gases but again the risk seems low.

Therefore, it is important to note that these accidental leakages and spillages and other chemicals and residuals handling impacts or risks should be well developed and discussed in the DEIA report of the gold refinery project. The final determination can be done by the MET when the DEIA report will be approved by the MET. However, we recommended that emergency action plan and management of gold refinery plant and AWPP be coordinated to deal with any potential emergency at gold refinery plant during the operation.

**Regarding the hydropower pumped storage plant:** The hydropower pumped storage plant would be constructed at nearby the proposed AWPP site. This project is anticipated to produce electricity by releasing the stored water in an upper reservoir, which will be pumped from another reservoir at a lower elevation. The water source to be used under this project is planned to be supplied from the CWWTP outfall discharge which currently discharges to the Tuul River.

During the construction and operation phase of this project, an accidental leakages and spillages could be occurred due to vehicle and some storage of fuel at the site. As mentioned above, if an accidental leakage and spillage were to occur, and the spill entered the river or groundwater, theoretically it could impact the AWPP, although dilution with non-contaminated water during conveyance would mitigate that impact. Fortunately, the advanced processes at the AWPP are

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<sup>68</sup> Memorandum-Gold refinery plant, issued by AECOM to MCA-Mongolia on 05 of May 2020.



designed based on a risk-based approach for the purpose of removing a host of “unknown” pollutants in order to protect public health.

As mentioned in Section 6.1.8, drinking water supplies in UB city are completely dependent on groundwater sourced from production wells located in the alluvial plain of the Tuul River, which flows through UB city. The main source of the Tuul River flow is rainfall during the warm seasons and the flow varies depending on season and location.

On the other hand, the BWSE project would develop Biokombinat and Shuvuun wellfields to ultimately supply 50 million cubic meters per year of raw untreated water. By providing this additional supply, the BWSE would partially address the anticipated shortfall in water supply capacity by increasing groundwater withdrawals from the proposed two wellfields.

Thus, the potential impacts of groundwater abstraction from proposed two wellfields on Tuul River surface water are considered changes in terms of water quantity as discussed in Section 7.6. In other words, to determine whether full wellfield production would impact the number of near-zero flow days (defined as days with river flows less than 100,000 cubic meters per day) in the Tuul River. As part of the hydrogeological investigations performed in 2019 (AECOM, 2019a), the assessment of Tuul River surface water and groundwater interaction was conducted using the MODFLOW groundwater modeling system based on near-zero flow days and well drawdown criteria of Decree No. A-173 approved by MET.

The MODFLOW groundwater model simulations (e.g., assumed that current CWWTP effluent continuously discharges to Tuul River in the future) confirm that groundwater abstraction from Biokombinat and Shuvuun wellfield would not result in additional days of near-zero flows in the Tuul River surface water.

In addition to this, the calculated drawdown in the Shuvuun wellfield is less than 1 meter across the wellfield under average conditions. Thus, drawdown impacts due to groundwater abstraction from the Shuvuun wellfield do not appear to impact other wells in the area. In the Biokombinat wellfield, the drawdown across the wellfield under average conditions is approximately 0.5 to 1.5 meters. During the dry season, the drawdown in the vicinity of the Nisekh wellfield under dry conditions ranges from approximately 0.6 meters at the eastern end of the wellfield, to 1.7 meters in the western end of the wellfield closest to the Biokombinat wellfield.

The hydropower storage plant is planned that water source to be supplied from the CWWTP outfall discharge which currently discharges to the Tuul River. This plant would use 50,000 cubic meters of water to fill its reservoir at the start of the operation phase. During the operation phase, water loss would occur due to evaporation and other factors. Thus, this amount of lost water would be re-filled using the CWWTP outfall discharge. However, the amount of water loss would be assumed much less than reservoir capacity. As a conclusion, the hydropower storage plant would not generate potential cumulative impacts to Tuul River surface water resource in downstream area of UB city since it will use only 50,000 cubic meter water once, at the beginning of the operation phase, from the CWWTP outfall discharge which currently discharges to the Tuul River. In addition to this, as mentioned above, Tuul-Gobi project under hydropower storage plant project is planned that water source to be supplied from the CWWTP outfall discharge which currently discharges to the Tuul River. The Tuul River will not be recharged by the CWWTP effluent if the Tuul-Gobi project will be implemented. Thus, this will lead to some environmental risks in the vicinity of the BWSE project. For example, it could increase additional days of near-zero flows in the Tuul River surface water and drawdown impacts to other existing wellfields (e.g., Nisekh wellfield) when 50 million cubic meters per year of raw groundwater is abstracted from the two proposed wellfields. As recommendations, the implementation of Tuul-Gobi project would not be feasible due to high environmental risks which in turn negatively affect the Tuul River environment and the bulk water supply system of UB city via the BWSE project. Feasibility studies for the Tuul-Gobi project and the hydropower storage plant have not yet been conducted.

Therefore, it is important to note that these environmental impacts or risks should be well developed and discussed in the DEIA report of this project (e.g. hydropower storage plant and Tuul-Gobi project). The final determination can be done by the MET when the DEIA report will be approved by the MET.

### **9.3.5 Cumulative Impact Mitigation, Monitoring and Management**

The potential cumulative impacts from project activities have been identified in Section 9.3.2 and 9.3.3. As discussed in those sections, project-level potential impacts would occur in the vicinity of the BWSE project.

However, these potential impacts would be avoided, minimized, or reduced to negligible or low after the successful application of the proposed best engineering practices and mitigation measures in each ESIA or DEIA.

Therefore, defined potential impacts to VECs from these projects would not generate potential cumulative impacts in the vicinity of the BWSE project. Thus, no adverse cumulative impacts have been identified that are considered to be significant and in need of specific mitigation measures, monitoring or management, except for Tuul-Gobi project. However, the final determination of Tuul-Gobi project would be done once feasibility study and DEIA will carried out and approved by relevant government agencies and authorized institutions and companies according to Mongolian law.

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## **10. Environmental Impact Enhancement, Avoidance, and Mitigation**

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Potential impacts from BWSE project activities to soil, air, water resources and biodiversity are described and documented in Section 7.1. In accordance with the impact assessment framework presented in Section 3.3.2, impact significance determinations were defined based on the expected magnitude of impacts and the sensitivity of each defined receptor to impact. The impact determinations are presented in Section 7.1.

As stated in Section 3.3.2, if best engineering practices are in place that avoid or sufficiently reduce the impact of activities evaluated in the ESIA to below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. For adverse impacts that are not reduced to acceptable levels by best engineering practices—i.e., impacts are determined to be significant—further mitigation would be required to avoid, minimize, or reduce the potential impacts.

As described in Section 3.3.2.4, mitigation would be required for impacts determined to be of moderate or high significance. The mitigation identified in this section is formalized as management measures in the ESMPs, which are outlined in Section 13 and presented in Appendices F, G, and H.

### **10.1 Soils Impact Enhancement, Avoidance, and Mitigation**

Table 10-1, Table 10-2, and Table 10-3 present a summary of the impacts to soil associated with the BWSE project activities and the impact determinations presented in Section 7.4. As the significance of all residual impacts to soils are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed. No mitigation is prescribed.

**Table 10-1 Assessment of Soil Potential Impacts: Pre-Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Residual Impact Significance	Enhancement, Avoidance, Mitigation and
					Measures	Overall		
Exploratory and test well drilling	Soil cover disturbance and compaction Create the access road where required.  Spillage of engine fuel or other chemicals during operations.	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	None required
Geophysical survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Negligible	
Geotechnical field survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Negligible	
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Negligible	
Topography and geodesy field survey		Alluvial gravelly, alluvial derno and meadowish soil	High			Low	Negligible	
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Negligible	

**Table 10-2 Assessment of Soil Potential Impacts: Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Residual Impact Significance	Enhancement, Mitigation and Management plan
					Measures	Overall		
<b>Production well drilling</b>	Topsoil disturbance	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	None required
<b>Well construction</b>		Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	
<b>Pipeline installation</b>	Compaction, mixing, and loss of soil structure as a result of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Low	None required
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate		Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Low	
<b>Tuul River crossing</b>	Re-profiling of river bed and stream, and topsoil erosion	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	None required



Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact	Residual Impact Significance	Enhancement, Mitigation and Management plan
					Occasionally		
<b>Construction of AWPP facilities</b>	Mass soil movement and the formation of slope erosion features	Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate Low	None required
<b>Temporary works camp</b>	Compaction and loss of topsoil	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low Low	None required
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low Low	
<b>Land clearance and earthworks</b>	Increased soil exposure to erosion and loss of soil structure as a results of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate Low	None required
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Moderate Low	
<b>Contamination of soil</b>	Leaks and spills leading contamination and may affecting future use of soils	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration:	Moderate Low	None required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Residual Impact Significance	Enhancement, Mitigation and Management plan
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate		Temporary Frequency: Occasionally	Moderate	Low	

**Table 10-3 Assessment of Soil Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall		
<b>Groundwater abstraction from Wellfield</b>	No impacts	Alluvial gravelly, alluvial derno and meadowish soil	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Negligible	
<b>Maintenance pipeline of</b>	Compaction, mixing, and loss of soil structure as a result of stockpiling	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	None required
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Low	
<b>Access road</b>	Leaks and spills leading contamination	Alluvial gravelly, alluvial derno and meadowish soil	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	None required
		Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate			Low	Negligible	

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall		
<b>Solid and liquid disposal:</b>	Compaction and loss of topsoil	Mountain kashtanozem, Mountain chestnuts and chestnuts	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	negligible	None required

## 10.2 Air Quality Impact Enhancement, Avoidance, and Mitigation

Table 10-4, Table 10-5 and Table 10-6 present a summary of the impacts to air quality associated with the BWSE project activities and the impact determinations presented in Section 7.5. As the significance of all residual impacts to air quality are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed. No mitigation is prescribed.



**Table 10-4 Assessment of Air quality Potential Impacts: Pre-Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Exploratory and test well drilling</b>	Dust and emissions from vehicle movement and drilling activities.	Drillers and workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Geophysical survey</b>		Drillers and workers	High			Low	Moderate	Low	None required
<b>Geotechnical field survey</b>	Spillage of engine fuel or other chemicals during operations.	Local communities	High			Low	Moderate	Low	None required
<b>Topography and geodesy field survey</b>		Local communities	High			Low	Moderate	Low	None required

**Table 10-5 Assessment of Air Quality Potential Impacts: Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
<b>Production well drilling</b>	Release of dust and exhaust emissions	Drillers workers and	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Well construction</b>		Construction Workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Pipeline installation</b>	Increased air pollution due to dust and exhaust emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
<b>Tuul River crossing</b>	Deterioration of local air quality conditions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
					Occasionally				
<b>Construction of AWPP facilities</b>	Exhaust emissions and dust due to Degradation of soil and vegetation	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Low	None required
<b>Temporary work camps</b>	Deterioration of local air quality conditions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Land clearance and earthworks</b>	Release of GHG emissions and dust	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
<b>Air pollution</b>	Not direct release of emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
					Occasionally				

**Table 10-6 Assessment of Air Quality Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan	
					Measures	Overall			
Groundwater abstraction from wellfields	Not direct release of emissions	Local communities	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Negligible	None required
Maintenance of pipelines	Exhaust emissions and dust due to degradation of soil and vegetation	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
Access roads	Deterioration of local air quality conditions due to release of exhaust emissions and dust	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Negligible	None required



Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts		Magnitude of impact	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
Air pollution	Not direct release of emissions	Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Low/Moderate	Negligible	None required

## **10.3 Water Resource Impact Enhancement, Avoidance, and Mitigation**

Table 10-7, Table 10-8 and Table 10-9 present a summary of the impacts to water resources associated with the BWSE project activities and the impact determinations presented in Section 7.6. As the significance of all residual impacts to Tuul River surface water and its quality are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed. No mitigation is prescribed.

**Table 10-7 Assessment of Water Potential Impacts: Pre-Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan	
					Measures	Overall			
Exploratory and test well drilling	Alterations to surface water flow resulting from changes to the vegetation cover and soil compaction  Spillage of engine fuel or other chemicals during operations.	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	negligible	low	Negligible	None required
Geophysical survey		The riparian zone of the Tuul River	High			negligible	low	Negligible	None required
Geotechnical field survey		The riparian zone of the Tuul River	High			negligible	low	Negligible	None required
		Upland	Moderate			negligible	negligible	Negligible	None required
Topography and geodesy field survey		The riparian zone of the Tuul River	High			negligible	low	Negligible	None required
		Upland	Moderate			negligible	negligible	Negligible	None required

**Table 10-8 Assessment of Water Potential Impacts: Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
<b>Production well drilling</b>	Alterations to surface runoff as a result of removal of vegetation cover and soil compactions	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Well construction</b>		The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
<b>Pipeline installation</b>	Effects on dry stream bed at pipeline crossing point	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
		Upland	Moderate			Moderate	Moderate	Low	None required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
<b>Tuul River crossing</b>	Potential for increasing turbidity, sediment loads and contamination in the downstream	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	
<b>Construction of AWPP facilities</b>	Suspended solids in surface runoff resulting in deterioration of water quality	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Low	None required
		Upland	Moderate			Moderate	Moderate	Low	None required
<b>Temporary work camps</b>	Alterations to surface runoff as a results removal of vegetation cover	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
		Upland	Moderate			Low	Low	Low	None required
<b>Land clearance and earthworks</b>	Alterations to surface water flow resulting in changes to the vegetation cover and soil erosion	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
		Upland	Moderate			Moderate	Moderate	Low	None required



Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
Contamination of Water	Leaks and spills causing contaminated runoff or infiltration and transport through groundwater resulting in deterioration of water quality	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
		Upland	Moderate		Moderate	Moderate	Low	None required	

**Table 10-9 Assessment of Water Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential impact	Receptor	Sensitivity of receptor	Type of Impacts	Magnitude of impact		Impact significance (Pre-Best Engineering Practices)	Residual impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Groundwater abstraction from wellfields</b>	No direct impacts	The riparian zone of the Tuul River	High		Intensity: Low Extent: Site Duration: Long-term Frequency: frequently	negligible	Low	Negligible	None required
<b>Maintenance of pipeline</b>	Changes to natural drainage	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
		Upland	Moderate			Low	Low	Negligible	None required
<b>Access road</b>	Leaks and spills leading contamination	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
		Upland	Moderate			Low	Low	Negligible	None required
<b>Solid and liquid waste disposal</b>	Compaction and loss of topsoil	The riparian zone of the Tuul River	High	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Moderate	Low	None required

## 10.4 Biodiversity Impact Enhancement, Avoidance, and Mitigation

Table 10-10, Table 10-11 and Table 10-12 present a summary of the impacts to biodiversity features associated with the BWSE project activities and the impact determinations presented in Section 7.7. As the significance of all residual impacts to biodiversity features are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed for the pre-construction phase. Thus, no additional mitigation is required (see Table 10-10).

However, the application of the best engineering practices by Contractors and the Operator would not reduce to acceptable levels the significance of the residual impacts on the critical habitat area of the Mongolian marmot (*Marmota sibirica*) nearby the AWPP site during the construction and operation and maintenance phases. In addition to this, Contractors would not reduce to acceptable levels the significance of the residual impacts on the planted trees which are located within the protection zone of the finished water pipeline.

This requires additional mitigation measures to avoid, minimize and restoration to reduce the significance of the residual impacts on Mongolian marmot (*Marmota sibirica*) and the planted trees to be negligible or low (see Table 10-11 and Table 10-12). These additional mitigation measures is developed based on mitigation hierarchy concept of IFC requirements as shown in Table 10-13. As described in Table 10-13, the re-evaluated design of road to monument and the ovoo, as discussed in Section 5.1.6.3, has significantly reduced residual impacts to Mongolian marmot (*Marmota sibirica*) habitat area. Also, construction of proposed earthen berm (as one of the mitigation measures) between AWPP site and Mongolian marmot (*Marmota sibirica*) habitat area before any earthwork and construction work would reduce the remaining residual impacts in order to support Mongolian marmot normal behaviors. In addition to this, planting native shrubs and perennial plants, and building one permeable rock berm using natural stone along stream would reduce the current degradation and fragmentation of Mongolian marmot (*Marmota sibirica*) habitat. The implementation of these avoidance, mitigation and restoration measurements would support or achieve net gains of Mongolian marmot (*Marmota sibirica*) habitat area. This would result in the BWSE project not leading to a high risk for the Mongolian marmot (*Marmota sibirica*) habitat area. Therefore, in this case, a separate Biodiversity Action Plan would not be required since the BWSE project's "mitigation strategy" is integrated with appropriately designed monitoring and evaluation program as discussed in Table 10-13.

**Table 10-10 Assessment of Biodiversity Features Potential Impacts: Pre-Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
Exploratory and test well drilling	Vegetation cover disturbance and removal.  Fauna avoidance of noise and vibration from source  Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Low	Negligible	None required
		Birds* and mammals**	Low			Low	Low	Negligible	None required
Geophysical survey		Annual and perennial plant species	Moderate			Low	Low	Negligible	None required
		Birds*, Mammals** Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	Low/ Moderate	Negligible/Low	None required
Geotechnical field survey		Annual and perennial plant species	Moderate			Low	Low	Negligible	None required
		Birds*, Mammals** and Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	Low/ Moderate	Negligible/Low	None required
Topography and geodesy field survey		Annual and perennial plant species	Moderate			Low	low	Negligible	None required
		Birds* , Mammals** and Mongolian marmot ( <i>Marmota sibirica</i> )	Low And high			Low and Moderate	low	Negligible/Low	None required
*Magpie ( <i>Pica pica</i> ), Rook ( <i>Corvus frugilegus</i> ), Red-billed chough ( <i>Pyrrhocorax</i> ), Black kite ( <i>Milvus migrans</i> ), Common kestrel ( <i>Falco tinnunculus</i> ), and Demoiselle crane ( <i>Grus virgo</i> ). ** <i>Daurian pika (Ochotona dauurica)</i> and Long-tailed ground squirrel ( <i>Spermophilus undulatus</i> )									

**Table 10-11 Assessment of Biodiversity Features Potential Impacts: Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Production well drilling</b>	Vegetation cover disturbance and removal.  Fauna avoidance of noise and vibration from source	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
		Birds* and mammals**	Low			Low	Low	Low	None required
<b>Well construction</b>	Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
		Birds* and mammals**	Low			Low	Low	Low	None required
<b>Pipeline installation</b>	Vegetation cover disturbance and removal.  Fauna avoidance of noise and vibration from source  Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	Moderate	Low	None required
		Planted Trees***	High			Moderate	High	Moderate	Relocation Plan is required
		Salix communities	High			Moderate	High	Low	None required
		Birds* and mammals**	Low			Moderate	Moderate	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High	Moderate	Mitigation hierarchy is required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Tuul river crossing</b>	Vegetation cover disturbance and removal. Fauna avoidance of noise and vibration from source Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	Moderate	Low	None required
		Salix communities	High			Moderate	High	Low	None required
		Birds* and mammals**	Low			Moderate	Moderate	Low	None required
<b>Construction of AWPP facilities</b>	Vegetation removal due to mass soil movement Fauna avoidance of noise and vibration from source Mongolian marmot habitat areas lost and degradation Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	Moderate	Low	None required
		Birds* and mammals**	Low			Moderate	Moderate	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High	Moderate	Mitigation hierarchy is required
<b>Temporary works camp</b>	Habitat degradation	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
		Birds* and mammals**	Low			Low	Low	Low	None required



Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Land clearance and earthworks</b>	Loss and degradation of habitat due to increased soil excavation and dust emissions Spillage of engine fuel or other chemicals during operations.	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	Moderate	Low	None required
		Salix communities	High			Moderate	High	Low	None required
		Birds* and mammals**	Low			Moderate	Moderate	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			High	High	Moderate	Mitigation hierarchy is required
<b>Contamination of ecosystem</b>	Leaks and spills leading contamination of habitat	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	Moderate	Low	None required
		Salix communities	High			Moderate	High	Low	None required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
		Birds* and mammals**	Low			Moderate	Moderate	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Moderate	High	Low	None required
<p><b>*Magpie (<i>Pica pica</i>), Rook (<i>Corvus frugilegus</i>), Red-billed chough (<i>Pyrrhocorax</i>), Black kite (<i>Milvus migrans</i>), Common kestrel (<i>Falco tinnunculus</i>), and Demoiselle crane (<i>Grus virgo</i>).</b></p> <p><b>** Daurian pika (<i>Ochotona dauurica</i>) and Long-tailed ground squirrel (<i>Spermophilus undulatus</i>)</b></p> <p><b>*** Planted trees which are located within protection zone of the finished water pipeline (see Figure 7-10)</b></p>									

**Table 10-12 Assessment of Biodiversity Features Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
<b>Groundwater abstraction from wellfields</b>	No impacts	Annual and perennial plant species	Moderate		<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Long-term <b>Frequency:</b> frequently	negligible	Low	Negligible	None required
		Birds* and mammals**	Low			Low	Low	Negligible	None required
<b>Maintenance of pipeline</b>	Vegetation cover disturbance and removal.  Fauna avoidance of noise and vibration from source	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Low	Low	None required
		Salix communities	High			Low	Moderate	Low	None required
		Birds* and mammals**	Low			Low	Low	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Low	Moderate	Moderate	Monitoring program is required
<b>Access road</b>	Fauna avoidance of noise and vibration from source  Leaks and spills leading contamination	Annual and perennial plant species	Moderate	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
		Birds* and mammals**	Low			Low	Low	Low	None required
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Low	Moderate	Moderate	Monitoring program is required

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
					Measures	Overall			
Solid and liquid disposal:	Fauna avoidance of noise and vibration from source  Leaks and spills leading contamination	Annual and perennial plant species	Moderate	Negative and Direct	Intensity: Low Extent: Site Duration: Long-term Frequency: Occasionally	Low	Low/Moderate	Negligible/low	None required
		Birds* and mammals**	Low			Low	Low	None required	
		Mongolian marmot ( <i>Marmota sibirica</i> )	High			Low	Low	None required	
<div>*Magpie (<i>Pica pica</i>), Rook (<i>Corvus frugilegus</i>), Red-billed chough (<i>Pyrrhocorax</i>), Black kite (<i>Milvus migrans</i>), Common kestrel (<i>Falco tinnunculus</i>), and Demoiselle crane (<i>Grus virgo</i>). ** Daurian pika (<i>Ochotona dauurica</i>) and Long-tailed ground squirrel (<i>Spermophilus undulatus</i>)</div>									

**Table 10-13 Mitigation Hierarchy for Mongolian Marmot**

Hierarchy	Construction phase	Operational and Maintenance phase
<b>Avoidance</b>	As discussed in Section 5.1.6.3, The design evaluated in this ESIA replaces the existing dirt trail to the monument with a gravel road and pedestrian path, establishes a natural car parking area at the monument, and provides a walking trail that traverses southward across the western portion of the AWPP site from the monument to a juncture with the existing trail to the ovoo. This was incorporated in the biodiversity impact assessment in Section 7.7. This change in access road to ovoo significantly reduces impact to Mongolian marmot ( <i>Marmota sibirica</i> ) habitat area.	<ul style="list-style-type: none"> <li>- Implement no-traffic restrictions in home range area of Mongolian marmot (<i>Marmota sibirica</i>).</li> <li>- Implement no-driving restrictions (e.g., construction area near AWPP site) that also sets the suitable speed to limits risks to Mongolian marmots (<i>Marmota sibirica</i>) and habitat</li> <li>- Develop and provide marmot protection and avoidance training to all employees and visitors</li> </ul>
<b>Minimization</b>	<p>However, remaining impacts from earthwork and construction work of the BWSE project still would impact the Mongolian Marmot (<i>Marmota sibirica</i>) habitat area. Therefore, the following potential mitigation measure would be needed:</p> <ul style="list-style-type: none"> <li>- Construct barrier between Mongolian marmot habitat area and AWPP site prior to any earthwork and construction work <ul style="list-style-type: none"> <li>o The earthen berm would reduce potential impacts (e.g. noise impacts) in order to support Mongolian Marmot (<i>Marmota sibirica</i>) normal behavior (e.g. foraging time, feeding, breeding, and mating behavior)</li> </ul> </li> <li>- Implement no-traffic restrictions in home range area of Mongolian marmot (<i>Marmota sibirica</i>).</li> </ul>	None required

Hierarchy	Construction phase	Operational and Maintenance phase
	<ul style="list-style-type: none"> <li>- Implement no-driving restrictions (e.g., construction area near AWPP site) that also sets the suitable speed to limits risks to Mongolian marmots (<i>Marmota sibirica</i>) and habitat</li> <li>- Develop and provide marmot protection and avoidance training to all Project employees and visitors</li> <li>- Erection of warning and interpretive signs of Mongolian marmot (<i>Marmota sibirica</i>) that would be placed at natural parking area.</li> </ul>	
<b>Restoration</b>	<p>As discussed in Section 7.7, ecosystem services in the Aol have been substantially altered or degraded by human activities. During the construction work of AWPP site, soil would be excavated at approximately 5.3 hectares, which would lead biodiversity loss. In addition to this, a net gain is required in critical habitats in accordance with IFC PS6. Therefore, restoration measure would be necessary to support the net gain in Mongolian marmot (<i>Marmota sibirica</i>) habitat area. The following potential restoration measure would be needed:</p> <ul style="list-style-type: none"> <li>- Planting native shrubs and perennial plants in home range of the Mongolian marmot (<i>Marmota sibirica</i>) in order to support services<sup>69</sup> of ecosystems</li> <li>- Home range of Mongolian marmot (<i>Marmota sibirica</i>)</li> </ul>	None required

<sup>69</sup> IFS PS6: Supporting services will provide soil formation, nutrient cycling, primary production



Hierarchy	Construction phase	Operational and Maintenance phase
	near AWPP site is divided by seasonal stream. Building one permeable rock berm using natural stone along this stream would reduce degradation and fragmentation of Mongolian marmot ( <i>Marmota sibirica</i> ) habitat caused by water erosion during heavy rains.	
<b>Monitoring program</b>	A robust, appropriately designed Mongolian marmot ( <i>Marmota sibirica</i> ) monitoring program would be implemented at every stage of the mitigation hierarchy executed above. In other words, successful minimization can only be evaluated through a monitoring program. This monitoring program would be integrated into the ESMPs.	A robust, appropriately designed Mongolian marmot ( <i>Marmota sibirica</i> ) monitoring program would be implemented every stage of mitigation hierarchy executed above. In other words, successful minimization can only be evaluated through monitoring program. This monitoring program would be integrated into the ESMPs.
<b>Offset</b>	According to the IFC PS6, biodiversity offset should be considered only after appropriate avoidance, minimization and restoration measures have been applied. Therefore, offset should only be decided if monitoring program shows that proposed mitigation measures are inadequate.	According to the IFC PS6, biodiversity offset would be considered only after appropriate avoidance, minimization and restoration measures have been applied. Therefore, offset should only be decided if monitoring program shows that proposed mitigation measures are inadequate.

Figure 10-1 shows the existing Mongolian marmot (*Marmota sibirica*) burrows on the north and south sides of Songinokhairkhan mountain. There are several empty burrows, marked pink in the Figure 10-1, which could be used for relocation of Mongolian marmot (*Marmota sibirica*) from AWPP site, if deemed necessary as result of monitoring program.

Construction phase and Operation and Maintenance phase:

The monitoring of the Mongolian marmot (*Marmota sibirica*) will be carried out during construction.

Monitoring rationale will include:

- Reduce the significance of the residual impacts on the critical habitat area of the Mongolian marmot (*Marmota sibirica*) nearby the AWPP site during the construction.

Monitoring period will include (Contractor would select appropriate monitoring period):

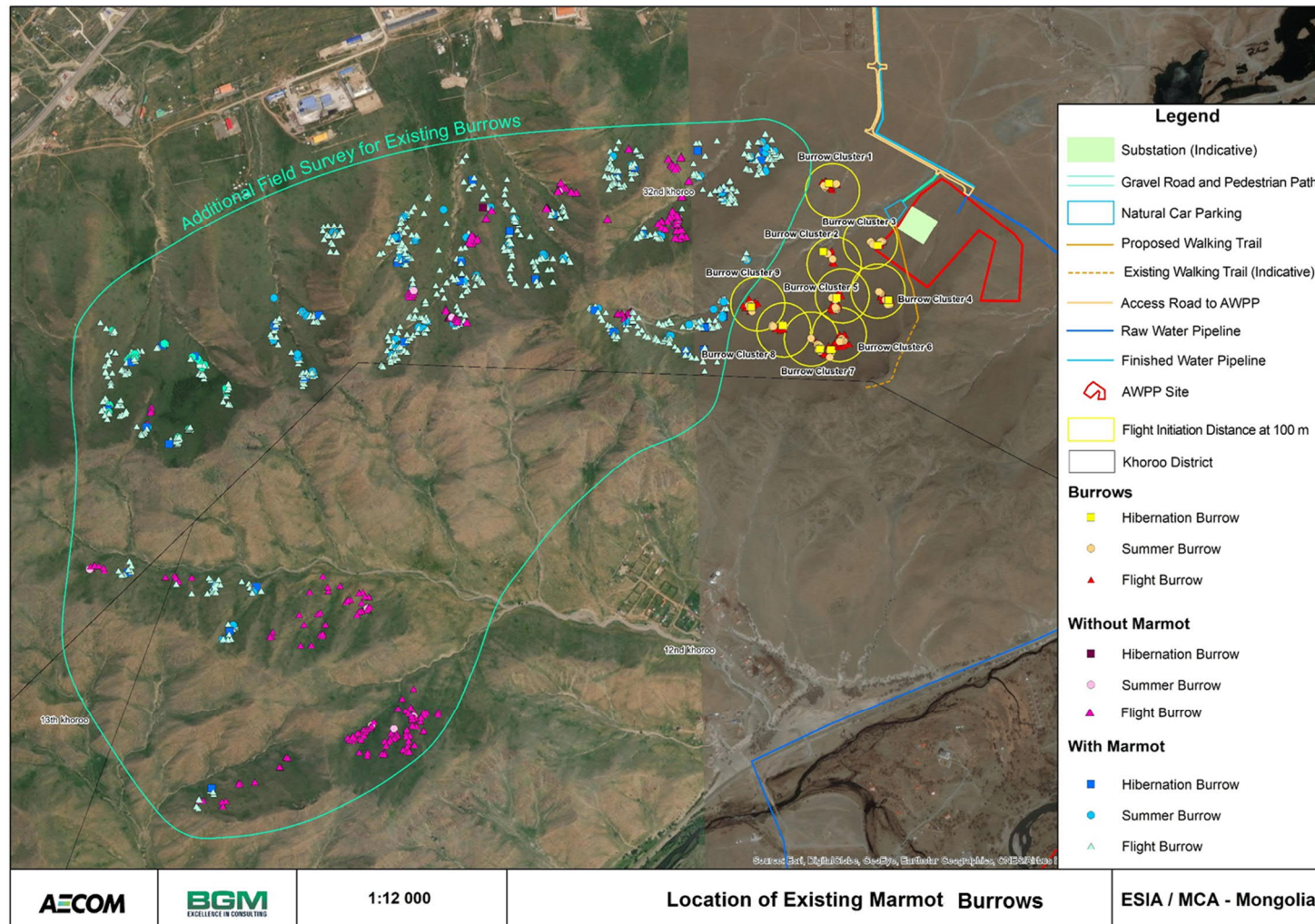
- Initial monitoring and observations are conducted in late March and early April each year during post-hibernation and mating. It allows Contractors or Operators to determine post-hibernation population, breeding behavior, and spatial location

etc. The next monitoring is conducted from late June through early July, when marmot pups are growing and eating outside of their burrows. This study is to determine the number of newborns and the location of female marmots with pups. The third monitoring should be performed in mid- to August to determine survivals and mortality of newborns. The last monitoring of the year should be done in late September, before the Mongolian marmot (*Marmota sibirica*) goes into hibernation. This information is important in determining the change in marmot population in each burrow and their location.

Monitoring activities and approaches will include (Contractor would select appropriate approach):

- **Direct Observation:** Mongolian Marmots live in a variety of social systems ranging from the mostly solitary groundhog to those highly social ones, where offspring from several years live together with their parents. The marmot mating occurs on land surface. They graze relatively far from their burrows. If a person or a predator is detected, marmots use alarm calls by standing on their hind legs. This kind of behavior allows scientists make direct observation. Researchers can use binoculars and telescopes to distinguish, record and identify individuals and their ages.
- **Use an automatic camera trap:** An automatic camera is placed on each hole in the family burrow. The use of camera traps is very important to study and collect data on the population of individuals in the family, the number of pups, behavioral relationships, daytime activities, invasion by land and air predators, and mortalities. The automatic cameras may be installed for long term if needed.
- **Use a drone:** A drone can be used to collect information on the spatial location of marmot families living within the monitoring area, to identify the location of burrows and landscapes, to determine the use and location of family holes, to monitor changes in family space, to determine vegetation types, and any human interferences. It should be fitted with thermal imaging cameras for every research.
- **Capture (possible method):** Marmot adults are captured using humane traps and marmot pups may be caught by hand as well. Capture of individuals in each family provides important demographical data such as the migration of the population of marmots, age structure, sex ratio, survival, and mortality within the monitoring area. After capturing, non-ferrous metal earrings can be used for marking.
- **Track of land and air predators:** Another method of monitoring is to track marmot remains nests of hunting birds and cortex shelters in the vicinity of the monitoring area. This information helps to identify the age group of the pups and older ones that are attacked and killed by predators.

Figure 7-12 and Figure 7-13 shows that the locations of the planted trees along the finished water pipeline. However, 397 trees are located in the protection zone of the finished water pipeline. Avoidance, minimization and restoration is not possible for these trees due to the limited space of corridor between AH3 highway and properties as seen in Figure 7-13. Therefore, these planted trees must be relocated because they cannot be put back in the protection zone as their roots could compromise the integrity of the finished water pipeline. The relocation of these trees would need to be done before the construction works of the finished water pipeline. The new locations of these trees should be coordinated with local authorities.



**Figure 10-1. Locations of Existing Marmot Burrows**

## **10.5 Noise Impact Enhancement, Avoidance, and Mitigation**

Table 10-15, Table 10-16 and Table 10-17 present a summary of the potential impacts of noise emissions associated with the BWSE project activities and the impact determinations are presented in Section 7.9. As the significance of all residual impacts of noise emissions are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed. No mitigation is prescribed.

**Table 10-14 Assessment of Noise Potential Impacts: Pre-Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Avoidance, and Mitigation
					Measures	Overall			
<b>Exploratory and Test well drilling</b>	Noise emissions from vehicles movement and drilling activities.  Spillage of engine fuel or other chemicals during operations.	Driller and Worker	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Low	None required
<b>Geophysical survey</b>		Driller and Worker	High			Moderate	High	Low	
<b>Geotechnical field survey</b>		Local communities and Workers	High			Low	Moderate	Low	
<b>Topography and geodesy field survey</b>		Local communities and Workers	High			Low	Moderate	Low	

**Table 10-15 Assessment of Noise Potential Impacts: Construction Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Avoidance, and Mitigation
					Measures	Overall			
<b>Production well drilling</b>	Release of noise emission	Driller and Worker	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Low	None required
<b>Well construction</b>		Construction Worker	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
<b>Pipeline installation</b>	Increased noise emissions due to works	Workers and Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Low	None required
<b>Tuul River crossing</b>	Release of noise emission	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Low	None required
<b>Construction of AWPP facilities</b>	Noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Moderate	High	Low	None required



**Bulk Water Supply Expansion**  
**Environmental and Social Impact Assessment**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Avoidance, and Mitigation
					Measures	Overall			
Temporary works camp	Release noise emissions	Workers and Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Low	Moderate	Low	None required
Land clearance and earthworks	Release noise emissions	Workers and Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	High	Low	None required
Noise pollution	Not direct release of noise emissions	Workers and Local communities, workers	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Negligible	low	Low	None required

**Table 10-16 Assessment of Noise Potential Impacts: Operation and Maintenance Phase**

Key Activities	Potential Impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact		Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management plan
					Measures	Overall			
<b>Groundwater abstraction from Wellfield</b>	Not direct release of noise emissions	Local communities	High		<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Long-term <b>Frequency:</b> frequently	negligible	Low	Negligible	None required
<b>Maintenance of pipeline</b>	Noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Low	None required
<b>Access road</b>	Release of noise emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Temporary <b>Frequency:</b> Occasionally	Low	Moderate	Negligible	None required
<b>Noise pollution</b>	Not direct release of emissions	Local communities, workers	High	Negative and Direct	<b>Intensity:</b> Low <b>Extent:</b> Site <b>Duration:</b> Long-term <b>Frequency:</b> Occasionally	Low	Low/Moderate	Negligible	None required

## 10.6 Waste Impact Enhancement, Avoidance, and Mitigation

Table 10-17 present a summary of the potential impacts of waste associated with the BWSE project activities and the impact determinations are presented in Section 7.10. As the significance of all residual impacts of waste are determined to be negligible or low, additional avoidance or minimization of potential adverse impacts are not needed. No mitigation is prescribed.

**Table 10-17 Assessment of Waste Potential Impacts during the BWSE project phases**

Description of Waste type	Waste Category	Waste Storage Facility at the Site	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
Pre-construction phases					
Waste metal and drinks cans	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	None required
Food waste	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Waste tries from vehicles	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Waste oil from maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Oil filters and oily rags due to maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Potentially infectious waste from clinics and healthcare	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Used batteries from maintenance of vehicles	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Waste metal containing oil residues	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Contraction phase					
Site clearance waste	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Low	None required
Surplus concrete and other general mixed construction materials	Inert	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Low	
Waste metal and drinks cans	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Food waste	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Waste plastic packaging from construction materials	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Low	

Description of Waste type	Waste Category	Waste Storage Facility at the Site	Impact Significance (Pre-Best Engineering Practices)	Residual Impact Significance	Enhancement, Mitigation and Management Plan
Waste wooden packaging from construction materials	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Low	
Waste glass from construction materials	Non-hazardous	Applicable handlings available but capacity to accept waste from project may be constrained due to size of facility or distance from site.	Moderate	Low	
Potentially infectious waste from clinics and healthcare	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Used batteries from maintenance of vehicles	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Waste metal containing oil residues	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Operational and Maintenance Phase					
Waste metal and drinks cans	Inert	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	None required
Food waste	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Waste tires from vehicles	Non-hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Negligible	Negligible	
Waste oil from maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Oil filters and oily rags due to maintenance of vehicles and equipment	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Potentially infectious waste from clinics and healthcare	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Used batteries from maintenance of vehicles	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	
Waste metal containing oil residues	Hazardous	Applicable handlings available with sufficient capacity to manage the quantities of wastes generated.	Low	Negligible	

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## 11. Social and Gender Impact Enhancement, Risk Avoidance, and Mitigation

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Potential social and gender impacts from BWSE project activities are described and documented in Section 7.11. In accordance with the impact assessment framework presented in section 3.3.2.4, impact significance determinations were defined based on the expected magnitude of impacts and the sensitivity of each defined receptor to impact. The impact determinations are presented in Section 7.11.

As stated in Section 3.3.2, if best social safeguarding practices are in place that avoid or sufficiently reduce the impact of activities evaluated in the ESIA to below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. For adverse impacts that are not reduced to acceptable levels by best social safeguarding practices—i.e., impacts are determined to be significant—further mitigation would be required to avoid, minimize, or reduce the potential impacts.

As described in Section 3.3.2.4, mitigation is required for impacts determined to be of moderate or high significance. The mitigation identified in this section is formalized as management measures in the ESMPs, which are outlined in Section 13 and presented in Appendices G, H and I.

Table 11-1 and Table 11-2 summarize the social impact assessments and the enhancement, avoidance and mitigation measures recommended for inclusion in the ESMPs by project phase.



**Table 11-1 Assessment of Social and Gender Impacts: Pre-Construction Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Residual Impact Significance	Enhancement, Avoidance, and Mitigation
<b>Stakeholder Engagement</b>	Lack of information and discussion/consultation leads to delays, increased grievances, political interference and unnecessary pressure from uninformed groups	All stakeholders	High	Both negative and Positive and Direct	Intensity: High Extent: Site, districts and UB Duration: Permanent Frequency: Intermittent	High	Moderate	Revise and update the Stakeholder Engagement Plan for the project MCA-Mongolia or its representative to employ a Social Manager leading a Social Safeguards Team (SST) with two Social Safeguards Officers and two Community Liaison Officers During contract preparation mandate each contractor to have a Social Safeguards Officer in their core team Each contractor must have a stakeholder engagement plan agreed with the MCA-Mongolia specialists and coordinate with the MCA-Mongolia Stakeholder Engagement Plan An important task is supervision and monitoring of the UB MUD resettlement process to ensure compliance with the principles of IFC PS 5 on involuntary resettlement including community consultation, free consent, full market value for losses and compensation and timely livelihood replacement
<b>Grievances</b>	Delays and changes to implementation plans	All stakeholders	High	Negative and Direct	Intensity: Low to high Extent: Site Duration: Permanent Frequency: Intermittent	Moderate	Moderate	Insistence on the participation in and use/operation of the project GRM by all project partners mandated in contracts and monitored and supervised by MCA-Mongolia or its representative
<b>Resettlement</b>	Loss of land, structures and livelihoods	Affected Persons and Households	High	Negative and Direct	Intensity: Low Extent: Site Duration: Permanent Frequency: Singe process	Low	Low	Mitigation for adverse impacts of the resettlement process and outcomes are contained in the RAP The RAP contains special measures to ensure women, socially excluded groups

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of Impact Measures	Overall	Residual Impact Significance	Enhancement, Avoidance, and Mitigation
								and vulnerable people get equal access to and benefit from the resettlement process
	Loss of grazing land	Herding households	High	Negative and Direct	Intensity: Low Extent: Site Duration: Permanent Frequency: Ongoing through life of project	Low	Negligible	SST to organize with District Officers community meetings and dialogues to rearrange and agree community land access and interaction with herding communities
<b>Land take</b>	Potential threat of loss/ damage to or perceptions of infringement of religiously or spiritually significant cultural and sacred landscape and places	Songinokhairkhan Mountain Temples	High	Negative and Direct	Intensity: Low to high Extent: Site and immediate area Duration: Permanent Frequency: Ongoing	Major	Moderate	Avoidance of sites during design and all construction phases Enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction near to SK mountain – project support to rituals to allay perceptions of damage to the mountain's integrity Mandate in all partner contracts respect and avoidance for local culture and monuments Mandate respect and avoidance for culture in worker behavior code for each contractor
	Disruption to archaeological sites	Known and unidentified sites near to the area	High	Negative and Direct	Intensity: Low to high Extent: Site and immediate area Duration: Permanent Frequency: Ongoing	Moderate	Moderate	Avoidance of identified sites during design and implementation Consult Ministry of Culture and the Institute of Archeology about fencing off known sites if located near to works and ensuring access for the public Mandate adherence to the project Chance Finds Procedure in all project partner contracts to be used in the event of a new find Mandate training on cultural issues and the chance find procedure at all levels of contractor work force

**Table 11-2 Assessment of Social and Gender Impacts: Construction and Operational Phase**

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact Measures	Overall	Residual Impact Significance	Enhancement, Mitigation and Management plan
<b>Stakeholder Engagement</b>	Delays to Construction	All stakeholders	High	Potentially positive and Direct but negative if not undertaken properly	Intensity: High Extent: Site, districts and UB Duration: ongoing Frequency: ongoing	Major	Minor	Revise, update and implement the Stakeholder Engagement Plan for the project MCA-Mongolia or its representative to expand SST in relation to the increase in supervision and monitoring of contractors Mandate each contractor to have a Social Safeguards Officer in their core team Each contractor must have a Stakeholder Engagement Plan agreed with the MCA-Mongolia specialists and coordinate with the MCA-Mongolia Stakeholder Engagement Plan MCA-Mongolia or its representative monitor and supervise stakeholder engagement activities of contractors
<b>Community Consultation</b>	Delays to Construction, increased grievances	Affected communities and local administration	High	Potentially positive and Direct but negative if not undertaken properly	Intensity: High Extent: Site, districts and UB Duration: ongoing Frequency: ongoing	Major	Minor	SST undertake community information dissemination according to the Stakeholder Engagement Plan, conduct community meetings and undertake media activities to keep project information flowing effectively SST to introduce contractors' specialists to communities and monitor and supervise contractors contacts with communities All activities to be documented in the Stakeholder Engagement matrix for the project
<b>Grievances</b>	Delays to the construction	All stakeholders	High	Negative and Direct	Intensity: High Extent: Site Duration: ongoing Frequency:	Major	Minor	Insistence on the participation in and use/operation of the project GRM by all project partners mandated in contracts and monitored and supervised by MCA-Mongolia or its representative Mandate worker training on the GRM within each contractor work plan

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact Measures	Overall	Residual Impact Significance	Enhancement, Mitigation and Management plan
					ongoing			Mandate a company GRM process for each contractor for workers grievances relating to employment
<b>Access to Employment</b>	Improved community and contractor/ worker relations, reduced delays etc.	All local workers meaning workers from impacted khoroo	High	Positive and Direct	Intensity: High Extent: Site Duration: ongoing Frequency: ongoing	Moderate	Moderate	In so far as is compatible with MCC restrictions on employment regulations, encourage contractors to employ local unskilled and semi-skilled labor rather than to import labor from elsewhere in Mongolia or internationally
		Employment of women	High	Positive and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Moderate	Encourage contractors to achieve a minimum of 30% women in their labor force in contract Encourage opportunities for local women from affected families through the actions of MCA-Mongolia or its representative's Social Safeguards Officer who will facilitate lists of interested local women and pass these to contractors as well as liaise with the UB and District Labor Offices
		Affected persons	High	Positive and Direct	Intensity: Low Extent: Site	Moderate	Moderate	Encourage opportunities for affected persons especially socially excluded and vulnerable APs to gain employment with contractors by the SST collecting and forwarding names to contractors Contractors required to publish all categories of work with paygrades with equal pay for men and women doing each job. Mandate in contracts the prohibition of anyone under 18, require employers to document each worker's employment, maintain records and facilitate inspection and monitoring of their employment records Monitoring by MCA-Mongolia or its representative
		Socially Excluded and Vulnerable people	High	Positive and Direct	Duration: Temporary Frequency: Occasionally	Moderate	Low	
		Child Labor	High	Negative and Direct	Intensity: Low Extent: Site Duration: Temporary Frequency: Occasionally	Moderate	Negligible	

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact Measures	Overall	Residual Impact Significance	Enhancement, Mitigation and Management plan
<b>Counter-Trafficking in Persons</b>	Workers experiencing systemic abuses of employment	All Employers	High	Negative and Direct	Intensity: Moderate Extent: Site Duration: Ongoing Frequency: Constant	Moderate	Low	Mandate in contracts compliance with MCC Policy on counter-trafficking in persons ensuring fair and equal employment contracts for men and women that specifically exclude the unfair employment practices including forced labor, cited in the Policy  The contractor must have an internal grievance redress mechanism for employees to report abuses of employment.  MCA-Mongolia or its representative to set up a grievance hotline for employees of contractors to report breaches of anti-trafficking compliance
<b>Worker Behavior</b>	Poor behavior causing social problems and not meeting the standards required under MCC Policies on Gender and Social Exclusion and Counter-Trafficking in Persons	All workers on the project	High	Negative and Direct	Intensity: High Extent: Site and local areas Duration: Duration of contract Frequency: intermittent	Major	Low	Require all contractors to have a Worker Behavior Code of Conduct that each worker has to sign when employed  Mandate worker training in each contract on standards required to prevent workers creating nuisances in the local community.  Workers must be informed and enabled to use the internal grievance redress mechanism for reporting abuses of employment  This covers use or practices of illegal drug taking, gambling, alcohol consumption on site and work camps, sexual harassment, procurement of prostitution services and sex trafficking
	HIV/AIDS and imported diseases to local communities	All workers on the project and local communities	High	Negative and direct	Intensity: High Extent: Site and local areas Duration: Duration of contract Frequency: ongoing	Major	Low	Contractors to provide workers with healthcare facilities including testing and treatment  Contractors required to aid HIV/AIDS and communicable diseases to toolbox training talks
	Gender issues in employment and Gender							Contractors required to comply with the MCC Gender and Social Inclusion Policy

Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact Measures	Overall	Residual Impact Significance	Enhancement, Mitigation and Management plan
	Based Violence							by contracting specialist training for employees SST to contract specialist training on gender issues and separately gender-based violence training to add to the community information program
<b>Community conflicts</b>	Conflicts between local workers and communities with migrant Labor	Workers in communities and migrants	High	Negative and direct	Intensity: High Extent: Site and local areas Duration: Duration of contract Frequency: ongoing	Moderate	Low	MCA-Mongolia or its representative to encourage contactors to take local Labor SST to work with District Labor Offices to manage expectations of employment opportunities SST to add conflicts over employment opportunities to community information programs
<b>Provisioning and procurement</b>	Opportunities for local businesses and entrepreneurs to provide goods and services to the project and ancillary activities	Local communities and local businesses	Moderate	Positive and Direct	Intensity: High Extent: Site and local areas Duration Duration of project Frequency: intermittent	Moderate	High	MCA-Mongolia or its representative to organize information on procurement of goods and services to project partners and elements for local communities MCA-Mongolia or its representative to encourage contractors to use local goods and services/ subcontractors MCA-Mongolia or its representative to emphasize zero tolerance of corruption and bribery in contractor activities and set up a monitoring program and a whistleblower hot line for reporting transgression
<b>Location of temporary works camp</b>	Poor worker behavior and exploitation of local communities	All employees	High	Negative and Direct	Intensity: High Extent: Site/ Local area Duration: Temporary Frequency: Ongoing	Moderate	Low	Requirement that workers camps be located at least 2 km from local residential centers Permitted activities and restrictions on contact with local communities mandated in contracts and worker code of behavior.
<b>Provision of Clean water</b>	Clean water, better health	Residents of UB Residents of affected districts	High Low	Positive for UB residents				The project improves clean water supply mostly to UB and environs.



Key Activities	Potential impact	Receptor	Sensitivity of Receptor	Type of Impacts	Magnitude of impact Measures	Overall	Residual Impact Significance	Enhancement, Mitigation and Management plan
				Neutral for KhUD and SKhD residents				Many in the local communities are not served by piped water and therefore will not directly benefit from the project unless a way to increase local water availability at acceptable cost is found.
<b>Protection of Cultural heritage</b>	Damage to monuments or Ovoo, or to archaeological sites as yet undiscovered	Cultural and Archaeological sites within the Aol	High	Negative	Intensity: high Extent/ site: Local Duration: Ongoing Frequency: Ongoing	Moderate	Low	Implement the Chance Finds Procedure  Implement the cultural awareness employee training program

## 11.1 Social Safeguards Personnel

The success of the implementation of enhancement, avoidance and mitigation measures relies on each project entity having sufficient numbers and qualified staff to undertake the implementation, supervision and monitoring of all program activities.

### 11.1.1 MCA-Mongolia

MCA-Mongolia or its representative must include a Social Safeguards Team (SST) consisting of a suitably experienced Social Manager with resettlement experience and of management of social issues in construction. The Specialist must be supported by two Social Safeguards Officers, one of whom must be experienced in liaison with construction companies and familiar with work place training/ toolbox talks, the second will have gender and social inclusion experience, will manage MCA-Mongolia or its representative's coordination with the MCA-Mongolia Grievance Redress mechanism as well as other team responsibilities. The Team needs to have two Community Liaison Officers to work at the local level, one per district. The responsibilities of the team are:

- Manage, update, and implement the Stakeholder Engagement Plan
- Plan and lead community consultation meetings
- Ensure the design and delivery of effective information campaigns using all media
- Liaise with the UB MUD regarding the land acquisition and compensation process in resettlement
- Undertake further enquiry among herders as to the pattern of grazing disruption caused by land take and land reclassification
- Liaise with khoroo administration and local communities to negotiate new grazing arrangements for both winter and summer grazing
- Liaise with MUD, and contractors to implement and assist in resolution of grievances
- Inform community members of employment opportunities
- Assist local people to apply for vacancies through the Ministry of Labor and Social Protection offices
- Liaise with contractors to encourage and promote local employment over imported labor and emphasize the contractual obligations to aim for 30 percent of unskilled and semi-skilled jobs to go to women
- Liaise with experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender-based violence, gender equity, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Monitor and supervise contractor compliance with training, grievance systems internally, and the project GRM
- Monitor achievement of resettlement and review completion, and recommend further measures if households fail to reinstate their livelihoods
- Finalize the Vulnerable People's Plan and ensure implementation through the Ministry of Labor and Social Protection

As needed, the MCA-Mongolia or its representative must expand the SST size in relation to the increase in supervision and monitoring of contractors.

### 11.1.2 Contractors

Each Contractor must have a responsible Social Safeguards Officer (ideally with someone who has gender experience), appointed to manage the contractual obligations specified in the

contract, or a Contractor's Social Safeguards Team. Depending on the size of the company, the contractor must have at least one designated Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be useful to work with local labor where such employment is required.

Responsibilities are:

- Negotiate and agree with the MCA-Mongolia or its representative's SST the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with SST over community contacts
- Liaise with both MCA-Mongolia and SST to implement and assist in resolution of grievances
- Inform SST of employment vacancies and recruit through territorial offices of the Ministry of Labor and Social Welfare, and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the company internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the contractor's responsibilities with the project MCA-Mongolia GRM; documenting, reporting, and taking part in finding solutions

## 11.2 Stakeholder Engagement

Effective stakeholder engagement is aimed at keeping all stakeholders informed and involved where required. This needs up to date records of stakeholder interests and priorities so that information exchanges can be planned and delivered in a timely fashion. Well informed stakeholders enable smoother project delivery with fewer delays.

The project Stakeholder Engagement Plan is the responsibility of the MCA-Mongolia or its representative's designated Officer, as is the update and maintenance of the stakeholder matrix. Each contractor must have a stakeholder engagement plan (Contractor's Stakeholder Engagement Plan) agreed with the MCA-Mongolia specialists, coordinated with the MCA-Mongolia Stakeholder Engagement Plan, and operated by the contractor's Social Safeguards Officer. The Contractor's Stakeholder Engagement Plan must reflect the individual roles and responsibilities of each contractor in the project

At the very least, the Contractor's Stakeholder Engagement Plan must define

- How contacts with local communities are to be made and recorded and information shared with other project partners. Community interactions will be governed by a Standard Operating Procedure (SOP) agreed with MCA-Mongolia.

- The Contractor's Stakeholder Engagement Plan shall include the contractor's role in participating in the project Grievance Redress Mechanism,
  - How the company is to take action to resolve low level grievances and
  - How it will participate in higher tier grievance resolution.
- The company's role in participating in and contributing to the overall monitoring and evaluation of the project

## 11.3 Community Consultation

Effective communication with communities and other Stakeholders supports and encourages participation and increases satisfaction with the project; whereas, poor communication leads to adverse criticism, social conflict, and potentially delays. Protocols for conducting, recording, and disseminating the results of community consultation are required in the Stakeholder Engagement Plan in Appendix B and specified as management measures in each section of each contract. The SST and Contractor's Social Safeguards Officer will liaise to ensure that good and timely information is delivered, and communities consulted fairly and effectively using all appropriate media and on all aspects of social and environmental impact. All organizations must have a budget element for consultation to include hiring meeting spaces, manufacture of materials, and refreshments.

The SST will undertake community information dissemination and consultation according to the Stakeholder Engagement Plan. The SST will introduce contractors' officers to communities and monitor and supervise contractors contacts with communities and other stakeholders. All Social Safeguards personnel will ensure that gender and social inclusion measures are taken when planning meetings to ensure that all sections of the community are equally informed and consulted. This may require separate meetings for women and men or women only meetings, meetings for those considered vulnerable or with specific social groups. The aim is to enable everyone to have a voice and participate.

A standard operating procedure on meeting planning and protocols is required. All activities are to be documented in the Stakeholder Engagement matrix for the project.

## 11.4 Grievance Resolution

MCA-Mongolia has developed and implements a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of MCA-Mongolia project activities (MCA-Mongolia, 2020). A well-implemented grievance redress management system demonstrates that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

All persons are entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and the MCA-Mongolia or its representative should include a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system requires that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

The GRM is the devolved responsibility of the MCA-Mongolia or its representative but all project partners are required to accept the process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The

requirement to collaborate with the project GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism is intended to support traditional local-level mechanisms<sup>70</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It will also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

1. Internal MCA-Mongolia human resources complaints which are to be resolved according to the MCA-Mongolia human resources policy,
2. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
3. Law suits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) is compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields<sup>71</sup> (2018), and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city<sup>72</sup>.

The GRM in place for the ESIA data collection and public consultation process is the same as that for the RAP design and implementation in the pre-construction phase and is proposed to extend to all project related grievances in the construction and operation and maintenance phases.

The MCA-Mongolia or its representative will supervise and monitor the GRM. A Grievance Manager should be appointed and be responsible for maintaining the grievance redress matrix, although the size and magnitude of the likely grievance work could suggest that a Social Safeguards Team with a Social manager should be appointed and whom will take over the grievance redress mechanism. The grievance redress matrix is the record of every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The Grievance Manager facilitates the development and implementation of the grievance mechanism, administers some of its resources, monitors internal and external good practice, ensures coordination among access points, and makes certain that the system is responsive to the information it manages

The mechanism requires that each contracting company has an internal and external grievance policy and mechanism within each organization. The Contractor has to have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated

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<sup>70</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>71</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018;

<sup>72</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017;

with this project GRM. The Contractor must also have an internal grievance management system, as presented in Section 11.4.4.

The SST would manage most grievance procedures for the MCA-Mongolia or its representative, monitoring and supervising the contractors' Social Safeguards Officer. One member of the SST will be the designated officer for leading the handling of grievances and the redress mechanism. This assistance is especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise above that in each organization.

The SST will advise on and participate in training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

### 11.4.1 Complaint Resolution Procedure

These complaint resolution procedures are compliant with Mongolian Law.

#### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,



- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches;
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.
- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

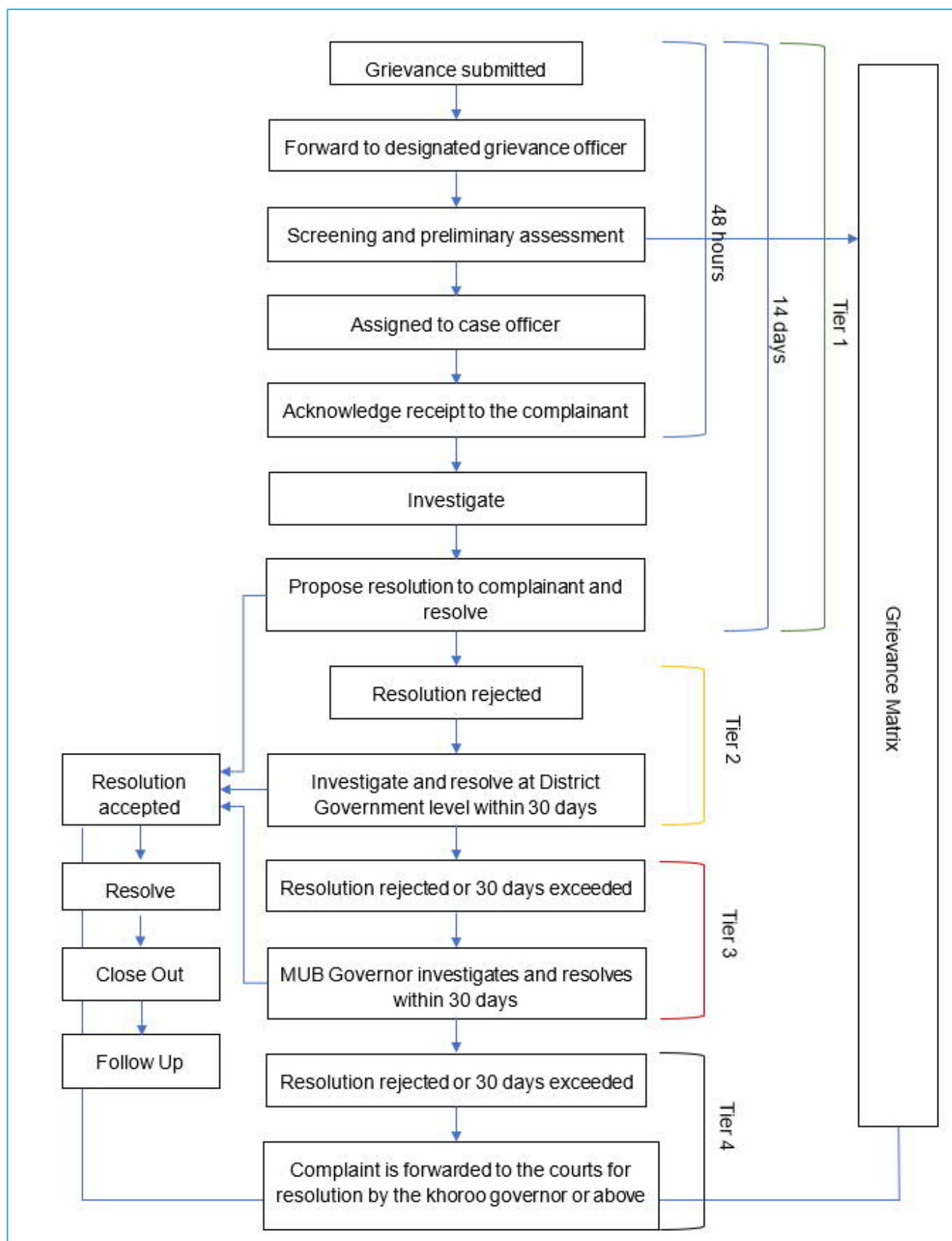
If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes. During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in Figure 11-1.



**Figure 11-1. Flow Chart of the GRM**

## 11.4.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Ensure that the SST include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative should periodically conduct an internal assessment of the GRM to evaluate and improve its effectiveness. Important elements of evaluation include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia should also solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 11.4.3 The Grievance Form

The Grievance Form (GF) will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)
- As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e. go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 11.4.4 Grievance Mechanisms for Contractors Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contact and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

Open discussion of such behavior is culturally difficult and there is an institutional preference to covering up and ignoring such problems. The Contractor must have an anonymous mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is proposed that investigations into these issues are conducted with both a member of the SST present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

The SST will assist the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected, and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.

## 11.5 Resettlement

Resettlement, and the relocation or loss of assets causes great distress to affected households. The RAP for the two affected districts is designed to mitigate the adverse impacts of resettlement impacts and includes not only land acquisition and asset compensation requirements to IFC PS 5 standards but also recognizes the need for livelihood restoration and support measures for vulnerable people to mitigate against long term hardship. IFC PS 5 requires that compensation and resettlement is complete and verified before work can start. Verification means that it is checked and proven that land ownership has been formally transferred, compensation for lost assets and allowances paid, and livelihood restoration started. Livelihood restoration is the most important long-term mitigation for affected people as simply recompensing people for lost assets does not guarantee that standards of living and income are restored or enhanced as required by the World Bank Policy on Involuntary Resettlement.

The RAP contains special measures to ensure women, socially excluded groups, and vulnerable people get equal access to and benefit from the resettlement process. These are contained in RAP Section 6.4, Participation of Vulnerable Groups.

To qualify for the release of acquired land for project construction, all payments and transfers must have been made, relocation completed, and where livelihood restoration and support for vulnerable people are in place, these must be started and ongoing before land access can be permitted. The land acquisition process and compensation payment are the responsibility of MUB according to the legislation. However, assistance on negotiating access to grazing for animals in the 13<sup>th</sup> khoroo of KhUD will fall to the SST.

The number of livelihoods affected is very small but need appropriate mitigation when losses are confirmed; potentially herders will lose pasture land and will need assistance to find alternative grazing lands rather than starting completely new and different livelihoods. Currently, information on herding livelihoods is scarce due to the inability of interviewing under Covid restrictions. Further consultation is needed as the first step to discover the extent of impact and then consider approaches to mitigation when the nature and scale of impacts are known.

Partnerships with the Labor Department are important to assist in the implementation of creating restored livelihoods for affected communities. The implementation of the support measures for vulnerable people, if needed, will require liaison with the khoroo social workers to access GoM programs and may require further programs funded by the MCA-Mongolia. The SST will coordinate the implementation of support for vulnerable people with MCA-Mongolia.

## 11.6 Access to Employment and Human Resources Policy

IFC Performance Standard 2 *Labor and Working Conditions* requires a human resources policy. Mongolian law also has specific requirements for the employment of workers in the project. These are included in the Labor Management measure included in the ESMPs for the BWSE.

IFC Performance Standard 2 stipulates that:

1. The contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this Performance Standard and national law
2. The contractor will provide workers with documented information that is clear and understandable, regarding their rights under national labor and employment law and will provide reasonable working conditions and terms of employment.
3. The contractor will identify migrant workers and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work.
4. Working conditions and terms of employment examples are wages and benefits; wage deductions; hours of work; overtime arrangements and overtime compensation; breaks; rest days; and leave for illness, maternity, vacation or holiday.
5. Where accommodation services are provided to workers covered by the scope of this Performance Standard, the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services that are nondiscriminatory.
6. The contractor will permit collective bargaining and worker's unions and will engage with such workers' representatives and workers' organizations, and provide them with information needed for meaningful negotiation in a timely manner.
7. The contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.
8. The contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
9. Prior to implementing any collective dismissals, the contractor will carry out an analysis of alternatives to retrenchment. If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented to reduce the adverse impacts of retrenchment on workers.
10. Prior to implementing any collective dismissals, the contractors will carry out an analysis of alternatives to retrenchment. If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented to reduce the adverse impacts of retrenchment on workers. The client should ensure that all workers receive notice of dismissal and severance payments mandated by law and collective agreements in a timely manner.

11. The contractor will provide a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns. The mechanism should also allow for anonymous complaints to be raised and addressed.
12. The client will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.
13. The client will not employ forced labor, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor-contracting arrangements. The client will not employ trafficked persons.
14. The client will provide a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in the client's work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women.
15. With respect to contracted workers the contractor will take commercially reasonable efforts to ascertain that the third parties who engage these workers are reputable and legitimate enterprises and have an appropriate environmental and social management system/human resources policy that will allow them to operate in a manner consistent with the requirements of this performance standard
16. The contractor will establish policies and procedures for managing and monitoring the performance of such third party employers in relation to the requirements of this Performance Standard. In addition, the client will use commercially reasonable efforts to incorporate these requirements in contractual agreements with such third party employers.
17. The contractor will ensure that third party contracted workers have access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the contractor will extend its own grievance mechanism to serve workers engaged by the third party.
18. Where there is a high risk of child labor or forced labor in the primary supply chain, the contractor will identify those risks and if child labor or forced labor cases are identified, the client will take appropriate steps to remedy them.
19. Where there is a high risk of significant safety issues related to supply chain workers, the contractor will introduce procedures and mitigation measures to ensure that primary suppliers within the supply chain are taking steps to prevent or to correct life-threatening situations.
20. The ability of the contractor to fully address these risks will depend upon the contractor's level of management control or influence over its primary suppliers. Where remedy is not possible, the contractor will shift the project's primary supply chain over time to suppliers that can demonstrate that they are complying with this Performance Standard.

There are a variety of ways in which the PS 2 and Mongolian law apply to the employment of workers in the BWSE depending on the options selected as discussed in the following sections. These requirements are incorporated into the risk assessment and management measures discussed in the remainder of this section.

### **11.6.1 Local Workers**

Enhancement and avoidance of impact applies to directing employment opportunities for local people. The communities in the project districts have concentrations of marginalized, poor, and lower skilled workers. The area houses people migrating to UB for employment but who find it difficult to find more than informal work, often in poor conditions. The men, women, and those in vulnerable groups in the area all need work, even though the most opportunities are in the construction phase and therefore short-term.



The construction contracts must emphasize that contractors employ local people to undertake unskilled and semi-skilled jobs in the project. The advantages for contractors of employing local people are:

- Workers camps are not needed and the costs of importing labor, possibly foreign workers are removed.
- Local labor is less likely to have conflicts with the community over work and recreational demands.
- No cultural differences that require training programs to harmonize understanding and behavior
- No increase in illegal drugs, gambling, alcohol, and prostitution.
- Sex trafficking within the community is less likely.
- Damage to cultural heritage is less likely.

Previous experience has shown remarkable benefits to construction timetables and quality of output by employing local workers and artisans.

Contractors usually like to bring in their own work teams as they are already used to the company work practices and as tied to the contract can only focus on the work. However, importing labor, particularly from China or North Korea, sets up antagonism between workers and communities through demonstration of arrogance, disrespect for local culture and traditions, lack of respect for and attitudes to community women, and demands for drinking, gambling, drug taking, and prostitution facilities. Increased diseases and threats to community health usually accompany the use of imported labor.

Other projects have pioneered good practices in employing local people. This was achieved through cooperation with the district Labor Offices by the SST and Community Liaison Officers. The SST encourages the publication of vacancies within communities and supports applicants to apply. The SST gathers names of interested workers from affected households and through community information programs and consultation meetings. These are shared with the District and Khoroo Labor Offices and forwarded to contractors. In projects where this was tried, the contractor was happy to achieve on time with little community conflict. Communities were happy for short-term employment with regulated conditions of contract.

Setting up a Brigade training sub-program element to assist Brigades to operate as employees or as subcontractors as described in Sections 7.11.4.1 and 11.6.6, assisted by the CLOs, is the best social impact mitigation for the project. Additionally, in so far as is compatible with MCC prohibition of restrictions on employment regulations by nationality, encouraging contractors to employ local unskilled and semi-skilled labor rather than to import labor from elsewhere in Mongolia or internationally is recommended. Whilst it is not legal to mandate against imported labor, the practice of employing local people should be strongly proposed.

The risks of employing brigades are:

- Delays while training is devised to assist brigades to work to the required standard
- Assistance will have to be given to help brigades to understand and produce policies, strategies and plans as required for subcontractors
- Possibly additional levels of management and supervision

The benefits are:

- Creating capacity and capability for local people for the future
- Keeping employment income local to UB

Every Contractor must prepare a Labor Management Plan, including an Anti-Sexual Harassment Policy. This will be reviewed by the SST, then be reviewed and approved by the MCA-Mongolia GSI. The plan must be compliant with IFC PS 2 (as presented in Section 11.6 above), MCC

Gender and Anti-Trafficking Policies prior to the Contractor commencing works. Each Contractor's plan will be monitored and audited by the MCA-Mongolia or its representative. This is described in full in Appendices F, G and H.

The Labor Management Plan will apply across the Project area, including all contractors' employees and subcontractor's workers engaged by the Project. Each contractor will prepare a detailed Labor Management Plan in keeping with the minimum requirements identified here. The contractor must investigate working conditions along the supply chain to ensure, in particular, that no forced or child labor is employed by the supplier.

The aim of the Labor Management Plan is to manage the employment of local unskilled labor and impacts of influx of semi-skilled and skilled labor because of the Project. The purpose of the plan is to:

- Define a formal and integrated approach to manage workforce presence and movement during all phases of the project; and
- To meet the requirements of the applicable regulations and relevant international standards and IFC PS 2.

The specific objectives of the Labor Management Plan are to:

- Prevent employment of minors below the age of 18 years
- Provide an analysis of pay grades by employment type which is published so that employers have to pay men and women the same rate for the same work.
- Provide a fair, consistent and transparent recruitment strategy and action plan to encourage local men and women to apply for the work
- Provide an employment forecast for all positions expected with qualifications to be submitted to the MCA-Mongolia or its representative and disseminated through district and khoroo Labor Offices
- Inform the MCA-Mongolia or its representative's CLOs of the recruitment forecast to enable the employment of local men and women as unskilled labor at each site
- Ensure employees are aware of their rights and entitlements including pay, festivals, sick and bereavement leave, and rest breaks;
- Ensure contractors comply with MCC counter trafficking in persons policy and guidelines in their employment conditions for employees;
- Deliver a fair and equitable environment that includes an employees' grievance mechanism for responding to and resolving employees' questions and concerns;
- Ensure compliance with all relevant Mongolian regulations, and relevant international standards;
- Ensure employee relations issues are managed justly, and in a coordinated and consistent manner; and
- Ensure separate sanitary arrangements for all locations where both men and women work.

Induction packages shall be mandatory for all employees and will include:

- Employment rights and conditions;
- Gender and Social Inclusion Policy;
- Contractor's Anti-Sexual Harassment Policy and awareness on what constitutes sexual harassment, exploitation and abuse;
- Countering the Trafficking in Persons Plan;
- Health hazards including HIV/ AIDs and STI's, awareness of the possibilities of the transmission of HIV/AIDs and communicable illnesses;
- Rights to have access to local festivals;
- Contractors' grievance redress mechanism;
- Cultural sensitivities, and social norms and practices in each area;
- Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of adults and minors.

The contractor may hire a third party organization to deliver appropriate training and awareness programs. The employer must provide a written reminder fact sheet for all employees reminding

them of the contents of the induction training. The Code of Conduct for workers must set out expectations and responsibilities for all project employees to ensure they understand cultural sensitivities within each district. It also must list local customs and festivals and their timings, and cultural practices by area and community. It must also specify penalties for contraventions including instant dismissal for proven incidences of sexual harassment and violence in the workplace.

The Contractor shall determine the potential for offering apprenticeships and other technical training to suitably interested and qualified employees. This can be achieved through engaging with education and professional organizations like TVET, the Implementing agency of the Ministry of Labor and Social Protections, the Mongolian University of Science and technology and the Mongolian Builder's Association. This would enable identification of qualified job applicants and offer potential establishment of internships. Internships can be offered to TVET graduates and to students studying water engineering and other relevant degrees at the university.

At the end of the employment period and prior to implementing any retrenchment or collective dismissals, the contractor will carry out an analysis of alternatives to retrenchment. If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented to reduce the adverse impacts of retrenchment on workers. The retrenchment plan will be based on the principle of non-discrimination and will reflect the client's consultation with workers, their organizations, and, where appropriate, the government, and comply with collective bargaining agreements if they exist. The client will comply with all legal and contractual requirements related to notification of public authorities, and provision of information to, and consultation with workers and their organizations.

### **11.6.2 Employment of Women**

The condition of women in the project area is particularly poor; women earn 69 percent less than men. Many women headed households are living on incomes below the minimum living standard, have very high unemployment rates, and higher numbers of dependents, and women face discrimination in accessing employment and at work.

The contracts for construction will contain a recommendation that each contractor should aim to achieve 30 percent women's employment. This is easier to achieve if local labor is engaged than if imported labor is brought in. This is best achieved through the proposals in Section 11.6.1 to find, and get to apply for, suitable local labor under the Labor Management Plans in the ESMPs. The SST will make efforts to inform and assist women to apply for work. In projects where this has been tried, this has resulted in a major increase in women's employment without a decrease in output. The contractors were satisfied.

Employers must be required to provide gender-segregated toilet and washing facilities.

Contractors must develop a procurement forecast of all goods and services that could be procured locally and a strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women. The Contractor's SST and the procurement team shall hold meetings and disseminate information on Contractor's shopping and procurement bidding through district and khoroo offices, community organizations, business associations and the media.

### **11.6.3 Employment of Socially Excluded/Vulnerable Groups**

Social exclusion in the project affected districts applies to the poor households living on incomes below the minimum living standard of 230,000 MNT per capita per month. These households are considered vulnerable through low incomes, high unemployment, few income earning members,

and higher rates of elderly, disabled, or young children members. Many of these households are female headed. Employment, even short-term employment would assist these households greatly. Hiring local vulnerable labor with the assistance of the SST, as per Labor Management Plans in Appendices F, G and H, will enable many households in this group to gain some employment for a period which is much valued.

#### **11.6.4 Child Labor**

Mongolian Law prohibits the employment of children under the age of 16 and regulates the employment for those aged 17-18 to industries and enterprises judged safe for minors. The construction industry does not qualify as suitable for employment for this age group. IFC PS 2 and MCC policy prohibits all child labor under the age of 18. This will be mandated in the contracts and emphasized and monitored by the MCA-Mongolia or its representative's Health and Safety Team through the supply chain.

Child labor does not solely arise in construction work, children are often employed as cleaners, cooks helps, running errands, carrying supplies, etc. The practice of condoning child labor is endemic in Mongolia, as in so many other places. Over 80 percent of poor households in the affected communities admit to sending children to work to support the family.

It is far better to enable the employment of an adult from the local community to work and allow children to go to school than to condone child labor. This can only be achieved by promoting local labor employment as above.

Therefore, the project will enforce a complete prohibition on the employment of minors – under 18 years of age – in the requirement for a Labor Management Plan in Appendix F, G, H. The Contractor is responsible for ensuring that all labor recruited is aged 18 years or older and has to enforce this requirement in contracts for labor force supply. This requires that the Contractor and labor force recruiter checks the identification of all personnel. If the person appears young, then the identification must be checked with community leaders to verify names and ages.

Any Contractor found employing minors will be reported by MCA-Mongolia or its representative to the police for civil action. The SST and the Contractor's SSO will conduct awareness training in community meetings regarding child labor.

Monthly toolbox talks will include discussions on child labor. Sessions should include ways in which workers can report suspected child labor and contacts to the district Children, Youth and Family offices.

#### **11.6.5 Foreign Labor**

Contractors need to be encouraged to employ local people.

Where foreign labor is imported by Contractors on BWSE, the Contractor must ensure that the Mongolian law on foreign labor conditions of employment on the same basis as Mongolian workers is adhered to and that the Labor Management Plan is implemented in full. This will be monitored by the MCA-Mongolia or its representative's Human Resources Team or Social Safeguards Team.

#### **11.6.6 Enhancement, Avoidance and Mitigation of Employment Opportunities**

The maximization of employment benefits from the project is achieved only by the mandating of local labor with assistance already described above. This makes the impact positive; whereas, allowing foreign workers makes the impact negative. The additional negative impacts caused by importing foreign labor are cumulative and any potential savings owing to the possible lower cost

are wiped out in terms of increased trafficking in persons, increased gender inequality, increased harassment, increased social ills, and increased cultural conflict and disharmony.

Local labor is vastly more supportive of MCC Policies on Gender and Social Inclusion and on Counter-Trafficking in Persons.

An effective enhancement of local employment impacts that makes a positive contribution to all aspects of construction work would be to develop a sub-project element to improve the capacity of the construction Brigades to work to international standards and appropriate worker behavior.

Project experience in Nepal has shown that fostering the development of building groups – as such are Brigades - in both labor intensive construction and more technological construction environments, is successful in increasing their capacity and activity and enables the project to be achieved in time and on budget. The aim is to produce brigades that can either contract to contractors or work as employees of contractors and gain experience of the requirements of working to international standards. There are 12 types of Brigade in the construction industry offering a range of skills for construction. These perform employment and work functions but are also very frequently social organizations with mutual support for members.

The Brigades face the following issues:

1. Lack of formal registration and licensing for many
2. Poor management capacity and practices.
3. Low representation of women in Brigades
4. Poor work management and lack of quality control, timekeeping and health and safety issues
5. Lack of policies or protocols on any aspect of work management
6. Little awareness of the rights of both men women in employment

Experience of setting up worker building groups show that the Brigades would need training and assistance. The outline of such a sub-project would be to gather sufficient construction brigade members before construction starts and offer initial training in the following aspects:

1. Group formulation, registration and effective management of the brigade
2. Electing officers – roles and responsibilities
3. Compliance with the Law on Labor and other Mongolian legislation
4. Construction standards
5. Policies and protocols required – e.g., a gender policy, anti-trafficking policy, health and safety policy, member code of conduct, grievance procedures and others required to work on international projects
6. Capacity building – what skills are needed
  - a. Contract development and pricing
  - b. Accounting skills
  - c. Assessment of physical construction skills
  - d. Understanding the tax rules and protocols
  - e. How to work with the project via contractors.

The initial training is aimed at getting existing Brigades to be able to start working with Contractors as the construction period starts. Further monthly training sessions would build on the knowledge and experience gained to date and support further improvements and delivery of good quality work. A training organization will be needed to design the program and deliver training. The SST, procurement and Health and Safety teams will contribute and support the program.

## 11.7 Counter-Trafficking in Persons

MCC Policy on Counter-Trafficking in Persons recognize two categories of trafficking – the first on employee conditions of employment contract is discussed here, the second relating to sex trafficking is discussed as part of the next section on employee behavior.

The MCC defines employment trafficking as the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery. A victim need not be physically transported from one location to another in order for the crime to fall within these definitions.

The Labor Law of Mongolia sanctions against these employment conditions but they are often found in employment in the informal sector. Compliance with The Law on Labor must be mandated in the construction contracts and the MCC Policy on Counter-trafficking in Persons is mandated to be complied with in terms of employment conditions. Contracts must include provisions designed to encourage gender and social inclusion by contractors such as:

- Mandating equal pay and benefits for men and women performing the same work.
- Encouraging the employment of women in at least 30 percent of skilled, semi-skilled and unskilled jobs.
- Preventing the employment of minors under the age of 18.
- Prohibiting the preference or exclusion of employment of persons on the basis of gender, ethnicity or sexual orientation.
- Prohibiting the transport of non-employees in Contractors' vehicles.
- Prohibiting the sexual harassment and gender-based violence, sex trafficking and soliciting and engaging minors for sex.
- Providing gender-segregated toilet and washing facilities at all sites where women work.
- Ensuring that cultural sensitivities in work areas are acknowledged and that workers are allowed to attend local festivals, etc.
- Provide training in addition to the usual health and safety programs on:
  - Attitudes and behavior towards women and gender issues
  - Awareness of the issues surrounding gender-based violence
  - Awareness of the exploitation of and trafficking in adult women and men, and minors
  - Cultural sensitivities between employees and in relation to sites of cultural and religious significance
  - HIV/ AIDS and sexually transmitted diseases
  - Conflict resolution in the home and community
- Mandating and enforcing a Worker Code of Conduct Procedure, which requires workers to behave in ways that do not offend local communities or increase negative impacts caused by drinking, gambling, illegal drugs, prostitution, sexual harassment, exploitation or violence to adult women and men, and minors.
- Mandating the refusal of bribes and sexual favors for advancement
- A worker's grievance procedure to manage employees' grievances and institutionalize supportive responses to employee grievances, particularly those relating to sexual harassment in the workplace.

Compliance will be monitored by the MCA-Mongolia or its representative's Health and Safety Team and the SST.



The MCA-Mongolia or its representative's SST and the Contractor's SSO will jointly conduct community meetings with the intention of fostering security within project adjacent communities. During the regular meetings the SST/SSO will remind communities of the anti-harassment policies, how the grievance redress mechanism works, Labor Management policy and the Code of Conduct regulating worker behavior, child labor, and also raise awareness of HIV/ AIDs, road safety and construction site safety.

## 11.8 Employee Behavior

Employee behavior can badly impact project achievement through creating social conflict likely to cause delays, cause negative attitudes to the project and potentially alienate stakeholders inside and outside the area of influence of the project. Additionally, poor employee behavior is contrary to the provisions and expectations of the MCC Policies on Gender and Social Inclusion and on Counter-Trafficking in Persons.

Behaviors that represent a serious project social risk, and often constitute crime, include:

- Introducing or increasing demand for drinking, illegal drugs, gambling and prostitution
- Abusive and harassing behavior to both women and men
- Violence in general and gender-based violence towards women in particular
- Sex trafficking
- Seeking to gain advancement by bribery or other corrupt means
- Increased communicable diseases

The contracts for construction will manage these negative impacts through requiring each contractor to have a Code of Conduct that each employee has to read (or have read to them) and sign when commencing employment. The code will emphasize the zero tolerance at work for these behaviors and the penalty in loss of the employment for proven cases. This is mandated in the Labor Management Plan in the ESMPs.

A Code of Conduct regulating worker behavior is required to address these issues and is mandated as part of the Labor Management Plan requirements. Under the Mongolian Law on Labor, Contractors have to lay out their obligations to workers, and also workers' rights and obligations. This requires that contractors define:

- Conditions of employment: working hours, rates of pay, rest periods;
- Provide an information sheet reminding workers of the commitments to anti-harassment
- Expected behavior of employees and compliance with Anti-Sexual Harassment Policy and the offences which will lead to instant dismissal;
- Rights of employees to a grievance mechanism, holidays, and cultural and festival access; and
- Conditions for work camps, shelter, water and sanitation, food and security.

All workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Code of Conduct by signing the code sheet. The signed document will include the requirement to respect local customs and practices. All Contractors are required to undertake a series of employment inductions and employee awareness programs at the commencement of employment and with reinforcement over the employment period. The code of conduct must include provision for a grievance mechanism to be in place throughout the construction period to ensure that any employee-related grievances will be reviewed with the employees on a regular basis to avoid any such further grievances. The Contractor shall include expectations of employee behavior in induction packages.

The MCA-Mongolia or its representative's Health and Safety Team and SST will monitor and Reinforce contractor compliance with this requirement.

Workers must be informed and enabled to use the internal grievance redress mechanism for reporting abuses of employment.

The MCA-Mongolia or its representative's SST and the SSO will inform communities of the policy on sexual harassment for workers and the process for incident reporting at regular community meetings. The project and contractor's policy on anti-harassment will be disseminated through khoroos and district governments.

## 11.9 Community Conflicts

Issues will arise between local communities and imported workers if imported workers are permitted. Expectations are high that local people will gain even short-term employment, as unemployment in the districts is high, many families are very poor, and need is great. Importing labor that local people feel could have been resourced from among themselves is a threat to the project.

Avoidance of this threat and enhancement of the project employment possibilities can be achieved through mandating local employment and using the system suggested in Section 11.6 to enable local recruitment alongside official channels.

## 11.10 Procurement through Local Businesses

The project offers considerable opportunities for local businesses and entrepreneurs at all levels to provide goods and services to the project and ancillary activities, from major supply contracts to canteen services for work crews. The positive impact of these opportunities can be enhanced through positive action to embrace local procurement in districts and UB.

The main inhibitor to local procurement is generally the lack of understanding of the procurement process and the methodology and language required to tender and then contract services. Previous experience has shown that local procurement can be fostered by the means of invitation of potential suppliers to workshops run by the procurement departments to inform suppliers of the right procedures and mechanisms of procurement. These should be held regularly over the project life as procurement needs change. The SST can support the procurement department to run workshops for both male and female owners of small businesses and start-up entrepreneurs.

MCA-Mongolia or its representative should actively encourage contractors to use local goods and services and subcontractors and emphasize zero tolerance of corruption and bribery in contractor activities. Procurement departments should regularly publicize future areas of procurement so that local businesses can prepare for tendering and negotiations.

## 11.11 Location of Work Camps

If construction camps are required, their locations would be determined by the contractors. The camps would need to meet the requirements of IFC Performance Standard 2, Labor and Working Conditions, and site selection would consider proximity to residences to minimize nuisance to communities and impact to environmental value of the site (e.g., previously cleared area preferred, no disturbance of critical habitat).

Where women are employed, toilets and washing facilities must be provided separately for men and women.

## 11.12 Provision of Clean Water

The objective of the project is to increase both the supply and quality of water provision to the inhabitants of UB and environs. However, many of the households in the local communities which are upstream of the water works, are not connected to the piped water supply and have to resort to expensive water purchase or streams, rivers and wells. The health benefits to UB users are manifold leading to better health, greater capacity to work and enjoy home life and increased incomes.

Greater direct benefits would be accrued if further work can be undertaken to design and fund extensions to the water distribution network throughout the affected communities and increase access to community water points for those who cannot be connected in the project affected districts. This would form a separate project. There is insufficient detail on availability of piped water locations in the affected communities to make firm suggestions and so an additional exercise to map water pipe routes into the affected communities would be needed. Once the location of pipes is known, the location of communities can be mapped and demand estimated. From this data a selection of possible benefit sharing options can be developed. These can vary from communal taps with suitable protection from freezing in winter, water selling kiosks, mobile water sales, etc. Such benefit sharing opportunities should be investigated by MCA-Mongolia.

## 11.13 Protection of Cultural Heritage

The BWSE project will be implemented in an area that includes the land at the foot of the Songinokhairkhan sacred mountain. The Songinokhairkhan Uul is located to the west of UB, and is one of the four sacred mountains of Ulaanbaatar. The sacred mountain is the location of the Monument to Terror Victims, which commemorates the execution in 1937 of the first group of political prisoners, in this instance monks, among the victims of purges that culminated in the second half of the 1930s. Further uphill is an ovoo, or magnificent shrine, which is constructed of stones and tree branches, decorated with colorful prayer flags and silk. The ovoo is symbolic of a deity in Mongolian shamanism, recognizes the sacredness of Songinokhairkhan Mountain, and is a site for worship and ceremonies. **The actual project site does not impinge on any cultural heritage site, extensive consideration has been taken to avoid any such impacts.**

The mountain is the focus of active worship for the population of UB and beyond and considered the dwelling place of the mountain's spirits. Local authorities and residents would like to maintain continuity of access to and activity at the sacred mountain. The mountain has important religious significance to Buddhists and therefore must be protected from disrespect and encroachment.

The project area has 18 temples – all of which have been avoided by designing the project to avoid them.

The area has a rich archaeological heritage with a number of important archaeological burial areas located over the project area. These have been excavated and preserved and need protection in both construction and operational phases by fencing in to protect against vehicular damage. It is entirely likely that there are more sites as yet unidentified – these will be protected by the inclusion of a chance finds procedure in all construction contracts that is compliant with the Law on Protection of Cultural Heritage (2014). The impact sensitivity and significance of infringements is high.

Mitigation of these impacts requires raising awareness of the value and respect required of cultural heritage locations and artefacts and enforcing appropriate behavior in the construction workforce, especially if these are foreign labor. This is managed by requiring good behaviors and practices of both contractors and workers which are written into the Contracts and monitored by

the SST. The MCA-Mongolia or its representative will lead ongoing community consultation on cultural heritage issues throughout the project.

The MCA-Mongolia or its representative's SST will lead consultations with communities throughout the life of the project over issues relating to cultural heritage. Where contractors are involved in a specific issue, the contractor's SSO will be included in discussions. The objective is to ensure that no cultural issues arise causing community distress, which may cause delays and other impacts to the project.

Contractors will be required to add respect for both tangible and intangible cultural and historical monuments into the Code of Conduct and to include these in toolbox talks and other training programs. Contractors will be required to have zero tolerance of employee abuses of cultural heritage and full responsibility for restitution of abuse.

The BWSE project will include:

- A chance find procedure to manage new discoveries mandated in all contracts with the requirement to include training on cultural heritage issues in tool box talks and the usual training program.
- Liaison with religious and spiritual leaders and communities to fence all known archaeological sites and features to prevent construction damage and facilitate access by the community managed by the SST.
- Mandated training in all contracts for all workers on cultural awareness and respect for cultural heritage.

The Chance Find Procedure is set out in the ESMPs but is summarized in here in Figure 11-2.

### **Chance Find Procedure**

As unknown features/objects could be encountered during works, in particular earthworks, a Chance Finds Procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.

Should any unexpected tangible cultural heritage be discovered:

- Cease all work in the immediate area and do not disturb the chance find further, including:
  - Establishing a 30-meter buffer around the chance find
  - Leaving buffer undisturbed until competent cultural heritage specialist assesses the site
  - Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.
- Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area
- Immediately notify the Engineer and the concerned government agencies, specifically the:
  - Office of the Governor of the capital city
  - Office of Governor of the respective Khan-Uul District or Songinokhairkhan District
  - Local police
  - Institute of Archeology, Mongolian Academy of Sciences
  - Institute of History and Ethnography, Mongolian Academy of Sciences
- Provide the following information to the Engineer and government agencies:
  - Cultural heritage site type—description and photograph(s)
  - Location—description and GPS coordinates
  - Date, time, and details of find
  - Nature of work that led to exposure of or locating the find
- Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation
- Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage
- Restart work only upon written direction from the Engineer

### **Cultural and Sacred Landscape and Places**

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

**Figure 11-2. Chance Find Procedure**

## 12. Analysis and Selection of Alternatives

### 12.1 “No Project” Scenario

The purpose of the alternatives analysis is to improve decisions on project design, construction, and operation based on feasible alternatives to the proposed project. The alternative analysis may facilitate consideration of environmental and social criteria at the early stages of development and decision making based on the differences between real options. The alternatives analysis should be conducted as early as possible in the process and examine feasible alternatives; alternative project locations, designs, or operational processes; or alternative ways of dealing with environmental and social impacts (IFC, 2012). This section of the report presents the analyses of the alternatives considered for the BWSE project, as per IFC guidelines.

The BWSE project is the largest municipal water supply project in Mongolia since the socialist period. The project will represent a major step for UB authorities to provide safe, reliable water to meet projected growth in water demands and remove water supply as a constraint to future economic development (AECOM, 2018a). The details of the BWSE project description and its components are described in Section 5. The project will bring improved water supply with higher quality to the citizens of UB but not to the project affected area unless further work can be undertaken to design and fund extensions to the water distribution network and wider access to community water points for those who cannot be connected in the project affected districts.

Routing and siting alternatives of the BWSE project components, including wells, conveyance pipelines and AWPP, have been analyzed in the context of engineering, environmental, socio-economic and cultural heritage optimizations that have been carried out during the feasibility study and preliminary design phases of the project.

Under the alternatives analysis presented here, the “**no project**” scenario is described in compliance with the IFC Performance standard and MCC environmental guidelines (MCC, 2012).

A summary of the “with project” versus “no project” scenarios, in terms of social, economic and environmental aspects is presented in Table 12-1.

**Table 12-1 Comparison of “No Project” and “With Project” Scenarios**

	No Project	With Project
<b>Economic</b>	Water shortage remains as key constraint for economic growth of UB.  No water supply expansion	Increased and reliable water supply will accelerate economic growth of UB  Procurement and investments will increase during the construction and operational phases and it will benefit the relevant local economic sectors, such as construction and technical services.  The latest developments in advanced water purification technology will be adopted in Mongolia.  USUG operations will improve and drinking water cost will increase.
<b>Social</b>	No change in current situation, However, issues related to water shortage will worsen.	The project will have great social benefits. The reliable and fresh drinking water source will be developed in UB.  Availability of quality water can have major positive impacts on the health, nutrition, overall well-being,



No Project		With Project
		<p>capacity to study and work, and the quality of life of UB residents, especially among vulnerable groups, the poor, pregnant women, children, infants, and elderly people.</p> <p>During construction, increased noise, vibration and dust from increased traffic may disturb residential communities and households.</p> <p>The impacts would be temporary and brief, and would be confined to work hours.</p> <p>Construction of the project may result in potential positive effects on local affected communities, such as opportunities of temporary employment, entrepreneurship, and service provision.</p> <p>Resettlement and compensation will be required.</p>
<b>Environment &amp; Tuul River Ecosystem</b>	<p>No changes in environmental baseline conditions and ecosystem services</p> <p>Tuul river surface water pollution remains as current situation</p> <p>No change in the efficient use of natural resource; for example, significant amounts of freshwater from groundwater resources are now used for cooling of combined heat and power plants nos. 3 and 4.</p>	<p>140,054.4 cubic meters per day of groundwater will be extracted from the Shuvuun and Biokombinat wellfields in Tuul River Valley without impact on number of low flow or near zero flow days of the Tuul River.</p> <p>Impacts on Tuul River surface water quality and riparian ecology would be minor.</p> <p>Impacts on ecosystem and ecology would be minor, except for the marmot habitat area near the AWPP site.</p> <p>Liquid and solid wastes will be generated at the AWPP; however, they will be disposed in environmentally friendly manner.</p> <p>The proposed recycling plant<sup>73</sup> will treat some of the effluent from the city's central wastewater treatment plant and deliver this recycled wastewater to combined heat and power plants nos. 3 and 4 for cooling. This will reduce and save fresh groundwater. Thus, this reduced water will be shifted to use for drinking water later.</p>

Under the “no project” scenario, water related issues in UB causing poverty, shortage of water, surface water pollution, unsustainability of ground water resource would not be resolved. The need for the BWSE project is demand driven. The project would give long-term benefits by providing a reliable and sufficient water supply to the population of UB and, thus, accelerating economic growth.

## 12.2 Locations

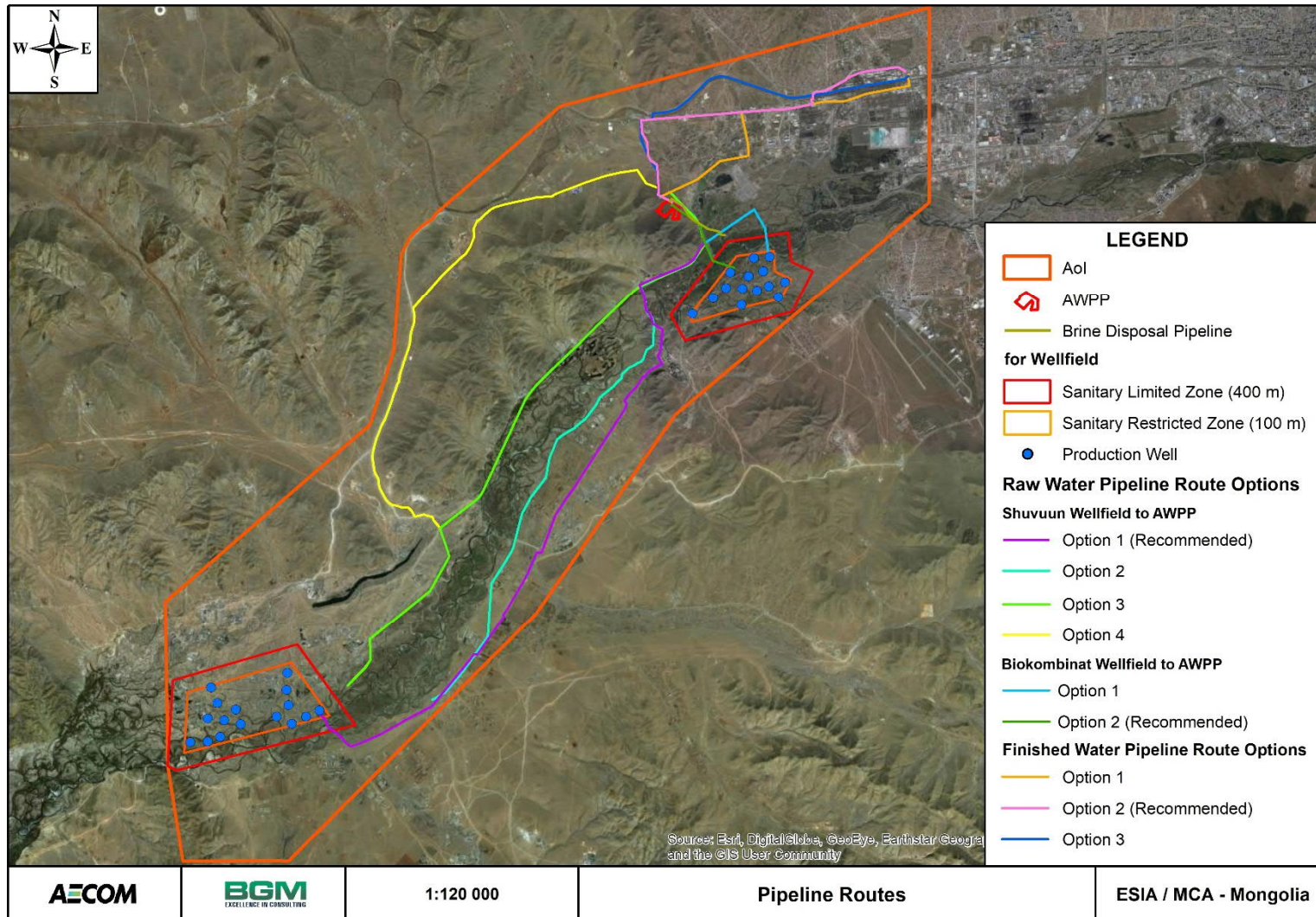
The BWSE project will be located in the territory of two districts, namely Songinokhairkhan district and Khan-Uul district of UB. The project components and infrastructure elements will be constructed in areas crossing over the five khoros of these two districts.

<sup>73</sup> <https://mca-mongolia.gov.mn/en/projects/increase-water-resource/project-3>

The BWSE project will consist of three main infrastructure elements:

- CP-1 Production Well Drilling, Construction, Development, and Acceptance Testing: Comprises only establishment of the wells on both wellfields, excluding all conveyance infrastructure
- CP-2 Advanced Water Purification Plant (AWPP): Comprises construction of the AWPP, including all site civil, structural, mechanical, electrical, and instrumentation components, as well as power distribution at the AWPP site
- CP-3 Raw and Finished Water Conveyance

The location of wellfields and wells, alternatives of raw and finished water transmission pipelines routes and AWPP site is illustrated in Figure 12-1. The location of the BWSE project has been decided based on recommendations of feasibility study (AECOM. 2018a). The location of wells and route of raw and finished water pipeline, and AWPP site has been selected during the design phase. Detailed information can be found in sections 12.3 and 12.5.



**Figure 12-1 Location of Pipelines Route and AWPP Site**

## 12.3 Wells

### 12.3.1 Wellfield location

A Feasibility Study was developed to evaluate the Tuul River Valley Aquifer for the most favorable area(s) to develop the future water supply in 2017. The field investigations covered 13 areas along an approximately 100 km reach of the Tuul and Terelj rivers. The feasibility study included a comprehensive evaluation of region-wide groundwater resources – field hydrogeology investigations, surface water-groundwater modeling, and water quality sampling. The selection of the wellfields depends on the criteria to control possible future increases in aquifer withdrawals. These criteria include factors related to the aquifer and to the Tuul River, as well as other criteria.

- **Aquifer Criterion:** A maximum drawdown of 50 percent of the saturated thickness was presented as a criterion. Decree No. A-173 approved by MET specifies that natural ground water resource volume's 0.3-0.5 can be used and the maximum acceptable amount of the drawdown cannot exceed 40-60 percent of the total aquifer thickness.
- **River Criterion:** Another general guidance relative to groundwater withdrawals is that they should not exceed 10 percent of the long-term average river flow.
- **Another criterion** is based on the flow-duration curve. This criterion states that if the volume below the average flow divided by the total volume is less than 0.4, the river may dry out. This ratio is now close to 0.4 for the Tuul River and dropping. Further decline may cause the river to dry up during the late summer.
- **Other Criteria:** In addition to aquifer and river impact criteria, water quality is another factor. The results of the sample analyses conducted by AECOM in 2017 and 2018 are compared against MNS limits and WHO guidelines; and for VOCs compared against USEPA limits. The sampling did not detect major water quality issues at the test / observation wells.

The groundwater model was used to assess the impact of various groundwater withdrawal strategies on the river flow. The model was specifically structured to allow estimation of these impacts, which can be measured in terms of the number of days with near-zero flow in the river. Since the evaluation determined that increased groundwater production in Zone 1 and Zone 2 would reduce the number of river flow days, which was seen by MCC as an environmental fatal flaw, focus was then directed to development of downstream Zone 3 groundwater resources in the area called Western Wellfields of Shuvuun and Biokombinat (AECOM, 2018a).

### 12.3.2 Well location

At the wellfields, the selection of the location of wells were based on three main:

- Geophysical survey
- Recommended distance between boreholes under A-173 guideline on estimation of the allowable water resource
- Aquifer parameters

These criteria are described as below.

A detailed hydrogeological field investigation was undertaken from May to September 2019. As part of the investigation, a surface geophysical survey was performed along 15 transects with 924 electrode points at the Biokombinat and Shuvuun wellfields. The results of the



geophysical survey were used to estimate the aquifer depth, estimate the most productive bearing zones, and to assist in locating the test pumping well locations along each transect. In addition, borehole geophysics was performed on eighteen 273-mm exploration and twelve 300-mm test pumping wells.

Another criterion is the recommendation of A-173 guideline approved by the Minister of Environment, Green development and Tourism on April 20<sup>th</sup> of 2015. To estimate the allowable water resource, the radius of the pumping wells depends on lithology and aquifer characteristics. In soil materials consisting predominantly of coarse-grained materials (cobbles, gravel and coarse sand) with lesser amounts of fine-grained sediments, such as those found along Tuul River, the minimum spacing between wells is 300 to 400 meters.

The last criterion is derived from the estimation of key aquifer parameters such as hydraulic conductivity, transmissivity, piezometric conductivity coefficient, and storage coefficient. These are important for evaluating the ability of future production wells to produce the required volume of water without causing excessive drawdown in the wellfields. The aquifer parameters were calculated and analyzed using the following three methods:

- Dupuit's analytical equation
- Theis-Jacob analytical method
- Aquifer Test software method

Based on the hydrogeological investigation results and sampling analysis, 30 boreholes in total, 14 in Biokombinat wellfield and 16 in Shuvuun wellfield were selected for the production wells. The spacing between the wells will be at 250-300 m apart. Each well will be designed to supply a maximum flow of approximately 76 to 80 l/s. The combined maximum flow from the wells will be approximately 50 million cubic meters per year, as approved by WRC of MET (BWSE, Hydrogeological investigation report, 2019).

The two wellfields will contain a total of 30 well pump houses. At each wellfield the well pump houses are identical in size and well pump well discharge head, piping, valves and a surge tank. Each will require heating to maintain unoccupied conditions as well as minimal ventilation. The adjacent electrical rooms will also require minimal ventilation and tempering. There will be no plumbing or fire protection systems associated with the wellfield buildings. Portable standby generators will be provided at each wellfield for emergency power supply.

### 12.3.3 Well design and cost

Conventional and Radial Collector Well (RCW) type wells for use in Shuvuun and Biokombinat were considered and evaluated as part of the feasibility study and preliminary design phases of the project. These types of wells were compared against a set of 14 criteria as illustrated Table 12-2.

**Table 12-2 Comparison Summary Conventional vs Radial Collector Well**

Criterion	Conventional Well	Radial Collector Well
1. <b>Well Yield</b>	70 - 80 liter per second achievable	400 liter per second or more
2. <b>Well-Drilling Expertise</b>	Locally available, extensive installation experience	Foreign only
3. <b>Well-Drilling Competition</b>	Not limited locally	Very few contractors world-wide, foreign only
4. <b>Well-Drilling Equipment</b>	Locally available, extensive installation experience	Highly specialized and not locally available in Mongolia
5. <b>Proving the Resource</b>	Currently on-going	May require additional specialized hydrogeologic investigations

Criterion	Conventional Well	Radial Collector Well
<b>6. Land Needed</b>	Expansive, protection for as many as 32 wells	Concentrated
<b>7. Cultural Impact</b>	Potential limitations on land use	Fewer limitations on land use
<b>8. Drawdown and Water Quality</b>	Limited and localized drawdown. If properly located, less chance of water-quality impacts from Tuul River. If contamination enters one well it can be shut down and other wells can continue to operate.	Concentrated area of drawdown. Potential water-quality impacts from Tuul River – if contamination enters the RCW, it must shut down entire unit.
<b>9. Infrastructure Required (Conveyance/ Pump Stations)</b>	Up to 32 pumping stations and associated wellfield piping	As few as four pumping stations and associated wellfield piping
<b>10. Track Record in Mongolia</b>	Hundreds of wells, decades of use	Two wells, limited use, limited operational data
<b>11. Operational Flexibility, Redundancy &amp; Reliability</b>	Decentralization promotes flexibility, reliability and redundancy. Supply is less vulnerable to equipment failures and water-quality issues.	Centralized. Supply is more vulnerable in the case of equipment failure and water-quality issues. "All the eggs in one basket." Poor redundancy: if one RCW must be shut down. The system will lose 50% of capacity. To the RCW option may not meet "standby wells" requirement with one well offline.
<b>12. Operation &amp; Maintenance of Wells</b>	Expertise locally available	Expertise not locally available; specialized, perhaps not available in emergency.
<b>13. Comparative Capital Cost Estimate</b>		
<b>14. Comparative Capital Cost Estimate per Well Yield</b>		

Based on the cost comparison and evaluation of technical criteria, the conventional wells were selected. The conventional wells have the following benefits:

- Extensive expertise in the construction, operation and maintenance of conventional wells is available locally.
- Pumping rates of 76 to 80 l/s appear to be achievable from individual conventional wells in both Biokombinat and Shuvuun. This rate would allow for the pumps to operate for 15 to 18 hours per day, which is optimum to deliver the ultimate wellfield capacity of 70,000 m<sup>3</sup>/day each.
- Drawdown due to pumping of conventional wells would be relatively minor and would be distributed across each wellfield.
- Wellfields consisting of multiple conventional wells promote operational flexibility, redundancy and reliability in the water supply as a whole.
- The conventional well pumps would be equipped with variable frequency drives, and the design points of the pumps would be 80 percent of full speed capacity. If up to 3 of the 16 wells in each wellfield are down for maintenance, then the remaining well pumps could provide the maximum capacity of the field. This equals 20 percent redundancy and eliminates the need for additional redundant wells (and additional capital cost).

While RCWs have a number of attractive features, RCWs would also have a number of significant drawbacks in construction and operation. In term of the construction, it would depend on foreign contractors and experience as well as removal of large cobbles at numerous locations which requires sinking a large-diameter concrete caisson at significant expense and time. Also, RCWs are prone to contamination which would require closure of



the entire facility in case of occurrence (AECOM Basic Design Report for Wells and Conveyance, 2019).

The operating energy (running costs) requirements for the conventional wells vs. RCWs would be about the same – same total volume pumped per day and approximately the same total pumping head required to deliver the flow from the wellfields to the AWPP. All wells and RCWs will be equipped with pumps and motors with variable frequency drives and electrical and mechanical equipment at each installation site.

### 12.3.1 Raw Water Transmission Pipeline Routes

Alternative Raw Water transmission pipeline routes have been evaluated – two routes from the Biokombinat wellfield and four routes from the Shuvuun wellfield as shown in Figure 12-1.

#### 12.3.1.1 Biokombinat to AWPP

East and West route options have been considered for the route from Biokombinat Wellfield to AWPP. Evaluation factors including construction costs, operating costs, groundwater conditions, rock excavation, requirements for pipe jacking under highways, river courses, and railroads, environmental impacts, resettlement impacts, and potential easements across private lands and mining leased areas have been considered for each alternative.

Biokombinat Raw Water Pipeline Options Comparison was made in term of technical characteristics, construction costs, annual power costs and their advantages and disadvantages (see Table 12-3).

**Table 12-3 Biokombinat Raw Water Pipeline Options Comparison**

Parameters	Option 1	Option 2
<b>Total length, m</b>	4,608	2,757
<b>Start elevation (dynamic water level in wells), m</b>	1235	1235
<b>AWPP inlet elevation, m</b>	1307	1307
<b>Static Head, m</b>	72	72
<b>Required head (H static, H friction, H station), m</b>	81	78
<b>Alignment features</b>	Approximately 30%, or 1.5 km, of the pipeline route will be located parallel to the railroad.	478 m will follow the improved earth road embankment
<b>Advantages</b>	Pipeline embankment will be protected from flood if installed western side of existing railroad. Pipeline will not cross existing mining licensed area.	Will require less length of pipeline than option #1. Operation cost will be less than option #1. Pipeline will not cross existing mining licensed area.
<b>Disadvantages</b>	Compared to option 2 the ground surface conditions are complicated along the pipeline route. The length of the pipeline is longer than option 2. Will be Jacking under the river at 4 locations $26+43+20+37=126$ m Will be jacking under railroad at 1 location. 45 m	Will be Jacking under the river at 4 locations $40+40+11+52=143$ m Will be jacking under railroad at 1 location. 45 m

Parameters	Option 1	Option 2
	Will crossing with WWTP effluent channel in 1 location. 7 m	
<b>Annual Power Costs, USD</b>	425,822.69	437,689.88
<b>CAPEX, USD</b>	\$3,388,095	\$2,004,625
<b>Ranking of Options</b>	II	I

Alternatives Analysis Matrix including all evaluation factors such as technical characteristics, cost breakdown and environmental impacts was developed for selection of the feasible option. Overall value calculating magnitude of impact and score are shown in Table 12-4.

**Table 12-4 Alternatives Analysis Matrix**

Biokombinat to AWPP - Pipe Route Options			Option #1 East			Option #2 West		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value
<b>Length</b>		m	4,653	NA	NA	2,757	NA	NA
<b>Capital Costs</b>	0.50	\$	3,388,095	5.9	3.0	2,004,625	10.0	5.0
<b>Annual Power Costs</b>	0.50	\$	425,823	10.0	5.0	437,690	9.7	4.9
<b>Constructability - jacking<sup>2</sup></b>	0.20	m	356	10.0	2.0	376	9.5	1.9
<b>Constructability - jacking<sup>2</sup></b>	0.20	each	6	8.3	1.7	5	10.0	2.0
<b>Constructability - groundwater<sup>2</sup></b>	0.20	m	3,500	4.6	0.9	1,600	10.0	2.0
<b>Resettlement</b>	0.30	USD	0	10.0	2.0	2,994	0.0	0.0
<b>Easement (private land)</b>	0.20	each	0	10.0	2.0	0	10.0	2.0
<b>Environmental aspect</b>	0.30	impact	2	5.0	1.5	1	10.0	3.0
<b>Overall value</b>					18.0			20.8

<sup>1</sup>Score of 10 is given to lowest magnitude parameter.

<sup>2</sup>Constructability relates to construction schedule and potential delays. Costs for pipe jacking, rock excavation, embankments and wellpointing for groundwater removal are included in capital costs.

<sup>3</sup>Potential issue with RR route is that the GoM is planning to rebuild the RR which could cause damage to the buried pipeline along this route.

Based on the technical evaluation and cost analysis as well as assessment of environmental and social considerations, West Route from Biokombinat to AWPP is selected. This option has the advantage of being the shortest route, having the lowest construction cost, having the lowest operating cost, includes the fewest crossings of the Tuul River that require pipeline jacking, and includes the lowest impact on construction cost and schedule due to high groundwater conditions. Because of the shorter pipeline length, this route will have the lowest environmental impact. There are no resettlement issues for either route, and no potential easements across private lands or mining leases.

### 12.3.1.2 Shuvuun Wellfield to AWPP

Four possible raw water pipeline options have been considered for the route selection of Pipeline Options from Shuvuun Wellfield to AWPP (see Figure 12-1).

- Option 1 Highway
- Option 2 Tuul River East:

- Option 3 Tuul River West
- Option 4 Songino

In July 2019 AECOM conducted the rapid assessment of route selection of raw (Shuvuun area) and finished water transmission pipelines to address potential impacts on environmental components. Environmental components includes 5 main categories and 15 sub-indicators.

Table 12-5 shows detailed comparison ranking in terms of technical capacity, description and cost analysis, in addition, advantages and disadvantages of the options.

**Table 12-5 Shuvuun Raw Water Pipeline Options Comparison**

Description	Option 1	Option 2	Option 3	Option 4
<b>Total length, m</b>	20,200	20,250	18,000	21,000
<b>Start elevation (dynamic water level in wells), m</b>	1200	1200	1200	1200
<b>AWPP elevation, m</b>	1307	1307	1307	1307
<b>Maximum high elevation in pipeline alignment, m</b>	1307	1307	1307	1,393
<b>Alignment features</b>	Approx. 8.5 km of pipeline will be installed alongside the highway between Shuvuun and Biokombinat.	4.6 km of pipeline will be installed alongside of CHP Plant #4 water supply pipeline, which is installed with embankment.	10.23 km of pipeline is parallel to the railway. 3.8 km pipeline is in the existing improved earth road embankment.	Generally located along the existing dirt road. 3.8 km of pipeline is located along improved earth road.
<b>Advantages</b>	Pipe will run along existing road and soil water table is not higher than option #2, 3. Possible to use existing highway road for service road.	It is advantageous to be located parallel along the embankment of the existing water transmission pipeline of the Thermal Power Plant.	The length of the pipeline is shortest than other options Operational costs are less than other options	Minimal topographic complications along this route. not necessary to cross the river Jacking and sleeves will be a minimum Soil water appears to be more than 5 m depth
<b>Disadvantages</b>	Groundwater is within 3.0-3.5 m of depth Pass through the edge of 2 mining licensed areas. 500÷800 m far from Tuul river compared to Option 2, 3	Alignment follows the river's valley, and the groundwater is within 1.8 m of depth. Therefore, additional embankment will be required.	Alignment follows the river's valley, and the groundwater is within 1.5-1.8 m of depth. Therefore, a lot more additional embankment work will be required compared to other options. Embankment should be protected from high flood. Passes through the edges of 3 mining licensed areas.	Pass through the edge of 6 mining licensed areas. Length of pipeline is longer than other options. Peak point elevation is higher than other option, pump will require more head.
	Jacking and bore shall be made at	Jacking and bore shall be made at 2	Jacking and bore shall be made at 2 location under the	Jacking and bore shall be made at 1

Description	Option 1	Option 2	Option 3	Option 4
	6 locations under the road. 127.5 m Jacking and bore shall be made at 1 location under the railway. 39 m Jacking and bore shall be made at 3 locations under the river. 367 m	locations under the road. 80 m Jack and bore shall be made at 1 location under the dam of Thermal Power Plant. 30 m Jacking and bore shall be made at 1 location under the railways. 39 m Jacking and bore shall be made at 3 locations under the river. 300 m	railways and road. 39+20=59 m Jacking and bore shall be made at 3 locations under the river. 200 m	location under the railways. 40 m
<b>Annual Power Costs, USD</b>	\$653063	\$653063	\$642938	\$1093501
<b>CAPEX, USD</b>	\$13,694,515	\$14,498,847	\$14,885,072	\$13,229,313
<b>Preliminary cost estimate of resettlement, USD</b>	\$237,970	\$274,760	\$ 251,496	\$787,089
<b>Ranking of Options</b>	I	II	III	IV

Alternatives Analysis Matrix including all evaluation factors such as technical characteristics, cost breakdown and environmental impacts was developed for selection of the feasible option. The overall value calculating magnitude of impact and score are shown in Table 12-6. Option 1 has the highest value for feasible recommendation.

**Table 12-6 Alternatives Analysis Matrix**

Shuvuun to AWPP - Pipe Route Options			Option 1 Highway			Option 2 Tuul R. East			Option 3 RR			Option 4 Songino		
Objective	Weighting Factor	Parameter	Mag.	Score <sup>1</sup>	Value	Mag.	Score <sup>1</sup>	Value	Mag.	Score <sup>1</sup>	Value	Mag.	Score <sup>1</sup>	Value
<b>Length</b>		m	20,200	NA	NA	20,250	NA	NA	18,000	NA	NA	21,000	NA	NA
<b>Capital Costs</b>	0.50	USD	\$13,694,515	9.7	4.8	\$14,498,847	9.1	4.6	\$14,885,072	8.9	4.4	\$13,229,313	10.0	5.0
<b>Annual Power Costs</b>	0.50	USD	\$653,063	9.8	4.9	\$653,063	9.8	4.9	\$653,063	10.0	5.0	\$1,093,501	5.9	2.7
<b>Constructability - jacking<sup>2</sup></b>	0.20	m	534	0.7	0.1	449	0.9	0.2	259	1.5	0.3	40	10.0	2.0
<b>Constructability - jacking<sup>2</sup></b>	0.20	each	10	1.0	0.2	7	1.4	0.3	5	2.0	0.4	1	10.0	2.0
<b>Constructability - groundwater<sup>2</sup></b>	0.20	m	3800	6.6	1.3	8500	2.9	0.6	8500	3.0	0.6	2500	10.0	2.0
<b>Resettlement</b>	0.30	USD	\$237,970	10.0	3.0	\$274,760	8.7	2.6	\$251,496	9.5	2.8	\$787,089	3.0	0.9
<b>Easement (private land)</b>	0.20	each	10	2.0	0.4	10	2.0	0.4	5	10.0	2.0	24	0.8	0.2
<b>Environmental aspect</b>	0.30	impact	1	10.0	3.0	3	3.3	1.0	4	2.5	0.8	2	5.0	1.5
<b>Overall value</b>					17.7			14.6			16.3			16.5

<sup>1</sup>Highest Score of 10 is given to lowest magnitude parameter.

<sup>2</sup>Constructability relates to construction schedule and potential delays. Costs for pipe jacking, rock excavation, embankments and wellpointing for groundwater removal are included in capital costs.

<sup>3</sup>Potential issue with RR route is that the GoM is planning to rebuild the RR which could cause damage to the buried pipeline along this route.

Based on the alternatives evaluation criteria presented above, the Highway Route from Shuvuun to AWPP was selected, having the lowest construction cost, having the lowest operating cost, having the least amount of rock excavation, and includes the second lowest impact on construction cost and schedule due to high groundwater conditions. Because of the shorter pipeline length, this route will have the lowest environmental impact. This route has the least resettlement impact and the least number of potential easements across private lands or mining leases.

Well pump house: Individual well pumps will pump their discharge to a system of collection pipelines located within each wellfield, then the combined wellfield flow will flow through a single transmission main from each wellfield to the AWPP. Wells, well pumps and transmission pipelines will be sized to deliver up to the maximum wellfield capacity at the ultimate buildout condition.

### 12.3.2 Finished Water Transmission Pipeline Routes

A Finished Water transmission piping system is proposed to deliver water from the AWPP to the existing USUG distribution network. Finished water pumps located at the AWPP and transmission pipeline will be sized to deliver up to 1.25 times the maximum daily purification capacity at the ultimate buildout condition of the AWPP. This represents the maximum day demand ratio for the USUG network. Connection points will be included along the transmission pipeline to facilitate tie-ins for future city and USUG network expansion and to comply with the City's Water Masterplan.

Three alternative Finished Water transmission pipeline routes have been evaluated to deliver flow from the AWPP to the existing USUG distribution network at the Orbit junction of AH3 (see Figure 12-1).

- Option 1 South/Highway
- Option 2 Highway
- Option 3 RR North

Evaluation factors for each alternative include construction costs, operating costs, groundwater conditions, rock excavation, requirements for pipe jacking under highways, river courses, and railroads, environmental impacts, resettlement impacts, and potential easements across private lands, and most importantly the ability to provide convenient connections to future population centers.

As mentioned above, the rapid assessment of route selection of finished water transmission pipelines was conducted to address impacts on environment.

Table 12-7 shows detailed comparison ranking in terms of technical capacity, description and cost analysis, in addition, advantages and disadvantages of the Finished Water Pipeline options.

Alternatives Analysis Matrix including all evaluation factors such as technical characteristics, cost breakdown and environmental impacts was developed for selection of the feasible option. The overall value calculating magnitude of impact and score are shown in Table 12-8.



**Table 12-7 Finished Water Pipeline Options Comparison**

Parameters	Option 1	Option 2	Option 3
<b>Alignment features</b>	<ul style="list-style-type: none"> <li>5.8 km pipeline section will be along existing highway road from western provinces.</li> </ul>	<ul style="list-style-type: none"> <li>7.2 km pipeline section will be along existing highway from western provinces.</li> </ul>	<ul style="list-style-type: none"> <li>7.2 km pipeline section will be routing along existing railroad from Selenge and Darkhan province.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Pipeline length is less than other options at 8.5 km.</li> </ul>	<ul style="list-style-type: none"> <li>From water purification plant to the existing highway route doesn't have settlement area.</li> </ul>	<ul style="list-style-type: none"> <li>Less settlement area than other options.</li> <li>Less jacking than other options.</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>Pipe route will be installed in high settlement area, resettlement will be higher than other options.</li> <li>Pipeline route will cross 2 times with planned 13.69 km road from CHP#4 to the Songinokhairkhan mountain. Road design has completed and approved by agencies.</li> <li>Pipeline will cross 1 section with Tuul highway. (detail design developed and approved)</li> <li>Geotechnical survey found groundwater at 3 m depth along existing highway from western province. (Drilling completed October 2018)</li> <li>Will require future highway and RR jacking of dual pipelines to supply future CP-3, 4, 5, and 6 connections.</li> </ul>	<ul style="list-style-type: none"> <li>Higher settlement area than other options.</li> <li>Jacking quantity will be higher than other options.</li> <li>Pipeline will cross new planned road from intersection of western province highway to the car market complex. This road design has been completed and approved by authorities.</li> <li>Pipeline will cross 1 section with Tuul highway. (detail design developed and approved)</li> <li>Geotechnical survey found groundwater at 3 m depth along existing highway from western province. (Drilling completed October 2018)</li> <li>Will require future highway and RR jacking of dual pipelines to supply future CP-3, 4, 5, and 6 connections.</li> </ul>	<ul style="list-style-type: none"> <li>Pipeline length is greater than other options.</li> <li>Pipeline will cross new planned road from intersection of western province highway to the car market complex. This road design has been completed and approved by authorities.</li> <li>Pipeline will cross 1 section with Tuul highway. (detail design developed and approved).</li> <li>Does not require future highway or RR jacking of dual pipelines to supply future CP-3, 4, 5, and 6 connections.</li> </ul>
	<ul style="list-style-type: none"> <li>Requires jacking under the road at 6 locations. 35+55+24+50+24+14=202 m</li> <li>Jacking will be required at 2 locations under railroad. 17+68=85 m</li> <li>1 jacking will be required at existing flood channel 44 m</li> <li>Total: 331 m</li> </ul>	<ul style="list-style-type: none"> <li>Requires jacking under the road at 5 locations. 35+55+34+24+14=162 m</li> <li>Jacking will be required at 2 locations under railroad. 24+68=92 m</li> <li>2 jacking will be required at existing flood channel 20+44=64 m</li> <li>Total: 318 m</li> </ul>	<ul style="list-style-type: none"> <li>Requires jacking under the road at 4 locations. 35+55+39+14=143 m</li> <li>Jacking will be required at 1 location under railroad. 20 m</li> <li>2 jacking will be required at existing flood channel. 20+70=90 m</li> <li>Total: 253 m</li> </ul>
<b>Annual Power Costs, USD</b>	\$207,200	\$211,800	\$211,800
<b>CAPEX, USD</b>	\$7,893,040	\$8,461,015	\$8,389,638
<b>Preliminary cost estimate for resettlement, USD</b>	\$376,300	\$233,000	\$255,100
<b>Ranking of Options</b>	II	III	I

**Table 12-8 Alternative Analysis Matrix**

AWPP to USUG Connection - Pipe Route Options			Option #1 South/Hwy.			Option #2 Highway			Option #3 RR		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value
<b>Length of Route</b>		m	8450	NA	NA	9340	NA	NA	9580	NA	NA
<b>Capital Costs</b>	0.50	\$	7,893,040	10.0	5.0	8,461,015	9.3	4.7	8,389,638	9.4	4.7
<b>Annual Power Costs</b>	0.50	\$	207,200	10.0	5.0	211,800	9.8	4.9	211,800	9.8	4.9
<b>Constructability - jacking<sup>2</sup></b>	0.20	m	662	7.6	1.5	636	8.0	1.6	506	10.0	2.0
<b>Constructability - jacking<sup>2</sup></b>	0.20	each	9	7.8	1.6	9	7.8	1.6	7	10.0	2.0
<b>Constructability – groundwater</b>	0.20	m	376,300	6	1.2	233,000	10.0	2.0	255,100	9.1	1.8
<b>Resettlement</b>	0.30	\$	20	5.0	1.0	13	7.7	1.5	10	10.0	2.0
<b>Easement (private land)</b>	0.20	each	2	5	1.0	1	10.0	2.0	1	10.0	2.0
<b>Environmental aspect</b>	0.30	impact	8,450	NA	NA	9,340	NA	NA	9,580	NA	NA
<b>Overall value</b>					16.3			18.2			19.4

Six connection points have been planned as provided below, but additional points can be added during the final design stage as shown on the Options 1, 2 and 3 as follows:

- CP-1 Immediately after the pipelines exit the AWPP boundary to supply flows to Biokombinat, Ulziit, Aerocity/Khushgiin, Tuv aimag, Maidar City, and areas south of the AWPP.
- CP-2 Where the pipelines cross highway AH3 to supply flows the west to Jargalant, Rashaant, Khui 7 khudag - Mongol naadam, Argalant, Emeelt, Auto market,
- NOSK
- CP-3 Along the pipeline at Agropark, Takhilt, New city center to direct flow to the north.
- CP-4 To the existing Orbit pump station, Bayangoliin, Tolgoit, Military Village
- CP-5 To the industrial pipeline at Uildver
- CP-6 Connection to existing, non-commissioned 600 mm pipeline at the Orbit junction.

The alternatives analysis evaluated three route options; two routes along the existing highway AH3 from the western provinces along substantial portions of their alignments, and one, more northern route along the existing railroad from Selenge and Darkhan province. Although the longest route, the initially recommended option was the approximately 9.6-kilometer northern route along the railroad, as this option was expected to have less impacts on development along highway AH3 and would require less jacking.

However, the owners of Ulaanbaatar Railways would not accept the proposed route in railroad right-of-way or allow installation of the pipelines in the protection zone north of the right-of-way. Further discussion with stakeholders led to the subsequent selection of routing the pipeline in the highway AH3 right-of-way. The selected, approximately 9.3-kilometer route would require jacking under roads at five locations for an estimated 162 meters, under the railway at two locations for an estimated 92 meters, and under an existing flood channel at two locations for an estimated total of 64 meters. The MUB Route Approval Committee approved the route in May 2020.

### 12.3.3 Transmission Pipeline Materials alternatives

There are a number of alternative pipe materials available for the raw water and finished water transmission pipelines. These include:

- Ductile Iron cement lined (DICL)
- Steel epoxy lined (ST)
- Glass Reinforced Epoxy (GRE)
- High-Density Polyethylene (HDPE)

Factors for evaluating the suitability of pipe materials include internal operating and surge pressure limits, suitability for use with drinking water, depth of trench burial, groundwater conditions, corrosive soil conditions, installation requirements or restrictions, availability in Mongolia for construction and for future stores, durability and protection from damage during future construction work. Table 12-9 illustrates the comparative analysis of four different pipe materials.

**Table 12-9 Alternatives for Installing the Wellfield Piping**

Alternative	Description
<b>Alternative 1</b>	<p>Since the pipeline must be covered with 3 to 4 meters of earth to prevent freezing the bottom of a 900 mm pipeline trench would be 4 to 5 meters below grade. In areas where groundwater is 1 meter below grade (along the Tuul River aquifer) there would be about 4 meters of water to remove during construction. Installing piping under these conditions of high groundwater will be extremely costly. The soil is very permeable, and water flows very quickly through this particular porous material (this is good for well pumping and well production but very difficult for below-grade construction).</p> <p>This is a very costly operation requiring electric generators to power pumps, discharge piping to carry the pumped flow some distance away from the construction site (at least 200 m), and requires a location to discharge the flow away from the construction zone.</p>
<b>Alternative 2</b>	<p>This involves the installation of pipe just to the top of the groundwater and constructing an earth embankment above the top of the pipe to provide frost protection. If groundwater and the bottom of a 900 mm pipe is 1 meter below grade, then the earth embankment would be 4 meters above the top of the 900 mm pipe and existing grade. Side slopes could be constructed at a 3:1 slope and would require about 60 m<sup>3</sup> of soil per linear meter of pipeline for the 4 m of cover.</p> <p>Where the pipeline crosses a river branch or flow channel the crossing cannot be open-cut. In these locations the pipeline requires a jacked sleeve (or in some cases two) to pass under the river to carry the transmission pipeline within. In these cases, the embankment would end and the pipe would be installed deeper to reach the depth of the jacking pits located at each end of the jacked sleeves. Groundwater would need to be lowered to allow construction of the jacked crossings and concrete valve vaults.</p> <p>High embankments within the wellfields and across the Tuul River flood plain pose obstacles to flood flows. These embankments act as dams to the river flood flow and could cause the river levels to rise higher than the normal or previously experienced floods in some areas. This in turn poses a threat to the proposed well pump houses and makes it difficult to estimate the new high water levels for pump house design purposes. Pipelines from each well pump house and their embankments could be angled downstream relative to the flood flow direction to minimize obstruction to flood flows and minimize ponding. The surface would be finished with stone rip rap to prevent erosion.</p> <p>High embankments also pose restrictions to USUG service vehicles that will need to travel to each well pump house for equipment maintenance during routine operations and during emergencies.</p> <p>High embankments also pose restrictions to the movement of horses and cattle, and private vehicles and persons who are walking. If private vehicles are allowed to travel through the wellfield then it is likely that they will travel over the embankments, and not necessarily where the service vehicle access points are located. This vehicle travel will erode the embankments at those locations and reduce the amount of cover and frost protection over the top of the transmission pipeline. Ramps could be constructed but there is no guarantee that these vehicles will use these ramps. Private vehicles must be prohibited from traveling within the wellfields.</p>
<b>Alternative 3</b>	<p>Earth cover in trenches and/or earth embankment height could be reduced by insulating the pipe barrel with rigid polystyrene insulation across the top and down the sides of the barrel. This insulation is impervious to water and once buried would have long service life and has been used successfully in other extreme cold climates. 25 mm of insulation is equal to about 30 cm of earth. The following table indicates the thickness of insulation and earth that is the equivalent of 4 meters of earth cover.</p> <p>The advantage of this method is that the pipeline can be installed in areas of no groundwater to shallower depths with no embankments, AND in areas of high groundwater, pipe can be installed to the top of groundwater, insulated, then a minimal embankment would be installed. This reduces excavation costs, dewatering costs, and embankment costs. A minimum of 1 m of earth cover is required above the top of insulation for protection</p>

The installation of pipelines involving a combination of earth embankments with pipe insulation, and pipeline burial with groundwater lowering in specific areas is selected. The least costly alternative is to install all pipelines in areas of high groundwater with the bottom of pipe at the top of the groundwater level, insulate the pipe barrel with 250 mm of rigid polystyrene insulation, and cover the pipeline with one meter of soil. This will be the equivalent of 4 m of soil cover and will provide frost protection. Embankments will avoid excavating some sections into groundwater and some use of well pointing systems.

## 12.4 Equalization Tanks vs. Direct Pumping from Wells to AWPP

Both of the design of flow Equalization Tanks (EQ) and Booster Pump Stations (BPS) at both the Biokombinat and Shuvuun wellfields was evaluated. But during the course of the basic design, AECOM has been requested from MCA-Mongolia staff to evaluate pumping the flow from the wells directly to the AWPP in the interest of capital cost reduction, operations and maintenance cost reduction, and efficiency.

One consideration for pumping raw water to the AWPP is that the flowrate into the AWPP be regulated and controlled to provide smooth operation of the AWPP processes.

For the **EQ tank alternative**, EQ tanks would be included at each wellfield, and would receive flow from the well pumps. BPS's at each EQ tank would pump water directly to the AWPP. This would require a total of two EQ tanks and BPSs at each of two wellfields. Each EQ tank would be buried below grade to protect the structure and water contained inside from freezing. A separate BPS would be constructed adjacent to the EQ tank. Because the EQ tanks would be located somewhat close to each wellfield and well pumps, the probability of encountering groundwater during construction is high and would add significant cost to the project. The structure would need to be designed and constructed to prevent flotation resulting from high groundwater, and dewatering would be required during construction. In addition, a standby power system would be required at each wellfield to operate the BPS pumps (in addition to the well pumps).

For the **Direct Pumping alternative**, the flow from the wellfields would be pumped directly from the well pumps to the AWPP inlet header. Well pumps will be cycled on and off and flowrates would be automatically adjusted to match the flowrate of the finished water pumps at the AWPP. Control would be via fiber optic cable and Supervisory Control and Data Acquisition (SCADA) system operation between the AWPP control room and each individual well.

The cost for constructing two EQ tanks and two BPSs would be a cost that would be eliminated when pumping directly to the AWPP from the wellfields. However, because the well pumps will be pumping to a higher TDH when pumping directly to the AWPP, the motors and Variable Frequency Drives (VFD) will be larger. Also, the total energy cost for pumping a given volume of water from the wells directly to the AWPP would be slightly less for the EQ/BPS alternative because of the variations (loss of head) in EQ tank water levels during normal operations, the additional electro/mechanical equipment losses, and piping losses. The EQ/BPS alternative requires installation and operation of raw water booster pumps, electrical and mechanical equipment, and process piping.

**Hydraulic Calculations:** Hydraulic calculations were completed to determine whether or not a booster pump station was necessary from Biokombinat wellfield to the AWPP and from the Shuvuun wellfield to the AWPP. The hydraulic calculations were completed for two scenarios. The first pumping from the wells to Equalization Tanks adjacent to the wellfields, then pumping from Booster Pump Stations to the AWPP. Transmission pipelines were 900 mm diameter in all cases and a constant pumping rate of 810 l/s (equivalent to 70,000 m<sup>3</sup>/day wellfield capacity) was used.

The second alternative evaluated pumping directly from the wells to the AWPP, again with a constant pumping rate of 810 l/s.

**Capital Costs:** The capital cost estimation consists of two major parameters – pumps and facility construction. The cost estimates were both U.S. construction estimates, and

Mongolian estimates executed in MNT and results were converted to USD (MNT/2667) with the exchange rate of July 29, 2019.

**Operating Costs:** Operating costs were calculated for the alternatives based on the hydraulic power consumption calculation and capital cost calculation. A cost of \$0.058/kWh was used for power costs.

Wages were estimated based on prediction of workforce. The workforce for alternative with BPS is predicted to be 3 people working 3 shifts (one per shift) with salary of \$500/month. No labor was included for the wellfields as these are equal for both alternatives.

The cost comparison below includes only those costs that differ in each alternative and do **not** include components or labor that are common to both alternatives such as well drilling and installation, wellfield collection piping, transmission main piping, well pump houses, wellhouse security fencing, wellfield access roads, labor for wellfield security, etc.

**Table 12-10 Pumping from Wells to Equalization Tanks / Booster Pump Stations to AWPP**

Parameter	Well Pumps / Equalization Tanks / Booster Pump Stations	Estimated Annual Operating Cost – Buildout Year
<b>Capital Costs (\$)</b>	EQ Tanks/BPS – Biokombinat	\$1,140,000
	EQ Tanks/BPS – Shuvuun	\$1,506,000
	16 Well Pumps and VFDs – Biokombinat	\$480,000
	16 Well Pumps and VFDs – Shuvuun	\$480,000
<b>High Groundwater requiring pumping during construction</b>	Biokombinat EQ tanks and BPS would require groundwater pumping.	\$20,000
<b>High Groundwater requiring pumping during construction</b>	Shuvuun EQ tanks and BPS would require groundwater pumping.	\$20,000
	<b>Total Capital Cost</b>	<b>\$3,646,000</b>
<b>Operating Cost (\$/year)</b>	Annual Power Costs – Biokombinat Well Pumping and BPS Pumping to AWPP	\$470,000
	Annual Power Costs – Shuvuun BPS Well Pumping and BPS Pumping to AWPP	\$783,000
	<b>Total Annual Power Costs</b>	<b>\$1,253,000</b>
	Annual Labor Costs – Biokombinat BPS only	\$18,000
	Annual Labor Costs – Shuvuun BPS only	\$18,000
	<b>Total Annual BPS Labor Costs</b>	<b>\$36,000</b>

**Table 12-11 Direct Pumping from Wells to AWPP**

Parameter	Direct Pumping Wells to AWPP	Estimated Annual Operating Cost – Buildout Year
<b>Capital Costs (\$)</b>	EQ Tanks/BPS – Biokombinat	\$0
	EQ Tanks/BPS – Shuvuun	\$0
	16 Well Pumps and VFDs – Biokombinat	\$784,000
	16 Well Pumps and VFDs – Shuvuun	\$1,431,000
	<b>Total Capital Cost</b>	<b>\$2,215,000</b>
<b>Operating Cost (\$/year)</b>	Annual Power Costs – Biokombinat Wells Pumping to AWPP	\$419,000
	Annual Power Costs – Shuvuun BPS Wells Pumping to AWPP	\$732,000
	<b>Total Annual Power Costs</b>	<b>\$1,151,000</b>

The results of the cost estimates show that the alternative using Direct Pumping from the Wells to the AWPP is more cost effective as presented in Table 12-12 .



**Table 12-12 Two Equalization Tanks/Booster Pump Stations vs. Direct Pumping from Wells to AWPP**

Parameter	Equalization Tanks/ Booster Pump Stations	Direct Pumping from Wells to AWPP
<b>Number</b>	Two EQ tanks/2 BPSs	No separate tanks or booster pumps
<b>Capital Costs</b>	Higher – Additional pumps and electro/mechanical equipment and storage tanks.	Lower – zero cost for tanks or booster pumps and electro/mechanical equipment.
<b>Standby Generators Capital Cost</b>	Higher – Standby generators required at each BPS	Lower – Only portable standby generators required for well pumps.
<b>Potential for High Groundwater requiring pumping during construction</b>	Higher – EQ tanks/BPS located near wellfields with high groundwater. Requires dewatering.	Lower – No dewatering costs for tanks.
<b>Operating Cost</b>	Higher – Energy for pumping is higher because of re-pumping due to variations in EQ tank water levels, and losses from additional electro/mechanical equipment operations and BPS piping.	Lower – Energy for pumping directly from the wells to the AWPP is lower, and there are smaller losses from electro/mechanical equipment operations.
<b>Site Security</b>	Higher security costs for guards, fencing and cameras because of remote locations.	Lower – No security costs as there are no tanks or booster pump stations. Security already to be provided at wellfields.

Based on evaluation of the structure and design of the two alternatives and hydraulic calculations and estimation of capital and operating costs, pumping directly from each well to the AWPP is selected. This system eliminates the need for high capital cost of balancing tanks and separate pumping systems which will require more maintenance than direct pumping. It is critical that flowrates to the AWPP be moderated and controlled so as not to upset the treatment processes within the AWPP.

## 12.5 Advanced Water Purification Plant

The AWPP Building consists of three joined parts: the Administration Building, the Chemical Treatment Building, and the Conventional Water Treatment Plant. As mentioned above, the rapid assessment for four options of AWPP site to address potential impacts on environmental components was conducted. However, some limitations for these options, the AWPP was sited on government-owned land. It covers 12 ha of land at the base in northwest to the large mountain Songinokhairkhan (see Figure 12-2). This site has the advantage that it will be above any historic flooding from the Tuul River, as well as winter flooding caused by ice jams or ice buildup in the Tuul River or its tributaries. The AWPP construction/operation is not anticipated to result in any displacement of people or businesses.

The alternatives analysis for AWPP covers four major things that warrant detailed analyses, namely:

1. Approach to phasing
2. Options for ultraviolet disinfection or advanced oxidation
3. Options for clarification technology
4. Options for preferred reverse osmosis sizing and technology

The analysis presents a discussion of each of these topics, and provides a comparison of advantages and disadvantages, incremental capital and operating costs comparisons, and a recommendation for moving forward.

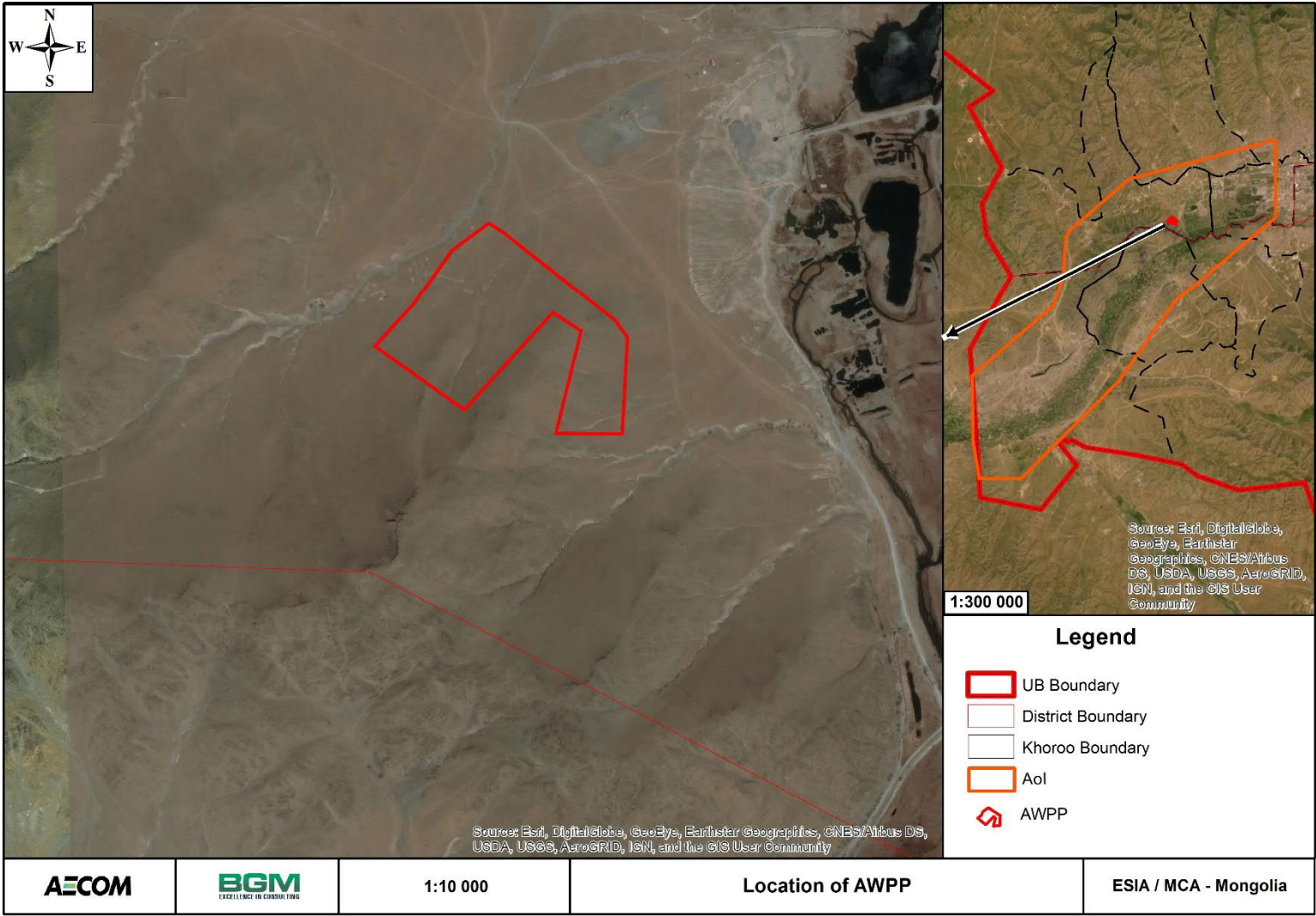


Figure 12-2 Location Map of the AWPP Site

## 12.5.1 Approach to phasing

Phasing of construction projects is often necessary for reducing costs and for addressing risk. Risk is characterized by uncertainty. The objective of the phased approach is to install enough equipment to meet a future demand which is reliably estimated, and to include advanced process that will address initially poor water quality, while making provisions for installing future equipment at a later date. The projected flow demands and associated timing of these demands are shown in Table 12-13.

**Table 12-13 Projected AWPP Flows**

Demand Phase	From (Year)	To (Year)	Finished Water Volume (m3/day)
<b>Initial</b>	Start-up	2025	10,000
<b>Interim</b>	2025	2030	50,000
<b>Build out (ultimate)</b>	?	?	140,000*

\* Well water flow volume

The Hydro-economic Analysis utilized the three scenarios to bracket the uncertainty in demands, based on growth projections in various sectors (for example, domestic, utilities, industry, and energy) each with low, medium, and high growth potentials. The Hydro-economic Analysis Report noted that the greatest growth potential (and thus greatest uncertainty) was in the energy and domestic sectors. For example, in the time period between 2021 and 2030, projections for increase in domestic water use were from 68 percent, 80 percent, and 104 percent for the low, medium, and high scenarios, respectively. For the energy sector, the water consumption growth scenarios were estimated at 69 percent, 142 percent, and 380 percent, respectively.

The wide range of potential future water demands clearly underscores the uncertainty surrounding the timing and magnitude of future demands. The challenge for the configuration of the initial construction of the AWPP is to control the cost of the initial construction and operation of the AWPP while managing the risk of failing to meet future demands.

This challenge is shown graphically in Figure 12-3. Alternatives for satisfying the initial and interim demands, which are fairly well defined, would minimize initial cost but expose MCA-Mongolia to the risk that a second large construction project would be needed to satisfy buildout demands. Conversely, constructing the AWPP to meet buildout demands would eliminate this risk, but would result in a costly initial construction project and the installation of equipment that may be idle for an extended period or not necessary. The optimal phasing plan would provide the greatest amount of treated water flow but at the lowest installed cost, initially, and would provide a reliable plan for expanding the AWPP. Therefore, alternatives for phasing must be based on achieving the buildout flows in a manner that is cost effective but also minimizes future construction.

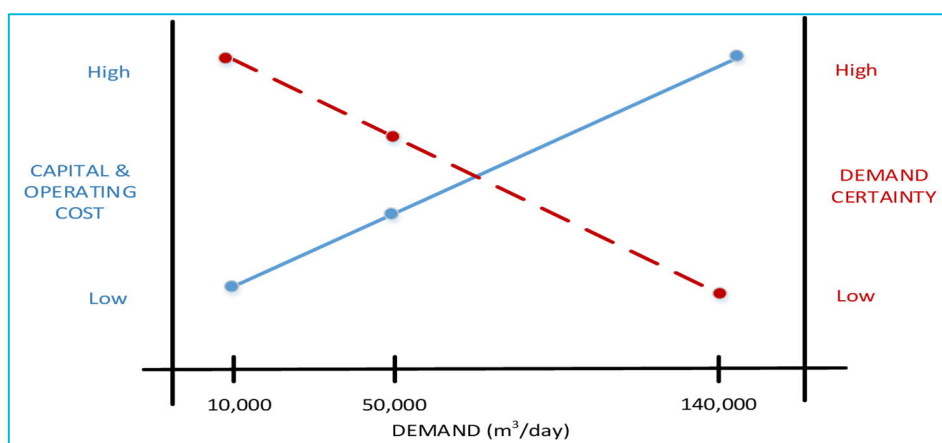


Figure 12-3 Capital Cost and Demand Certainty as a Function of Demands

With this goal in mind, AECOM has developed five (5) alternatives for phasing the construction of the AWPP. Table 12-14 specifies the advantages and disadvantages for each alternative.

Table 12-14 Alternatives for Phasing the Construction of the AWPP

Alternatives	Advantages	Disadvantages
<b>Alternative 1:</b> This alternative represents the lowest initial cost for construction but requires the largest amount of future expense and effort in order to handle the build out flows.	Lowest possible initial construction cost Lowest risk of over-committing to the future flow volume in the initial construction	Lowest initial treated water capacity Highest future cost Highest potential for disruption of future operations during construction Does not provide redundancy
<b>Alternative 2:</b> This alternative is similar in concept to Alternative 1 but satisfies redundancy by utilizing trains that have a higher capacity and would be slightly larger as a result.	Moderate initial construction cost Lower risk of over-committing to the future flow volume in the initial construction Reliability improved by redundancy	High future cost to expand facility Highest potential for disruption of future operation during construction
<b>Alternative 3:</b> While Alternative 2 is considered better than Alternative 1 with respect to reliability, the issue of significant future construction remains.	Redundancy High degree of flexibility for future expansion Relatively low future construction costs After expansion, ability to increase the maximum treated water capacity to 111,000 m³/day Takes advantage of contractor mobilization for construction of 4th train	Building spaces slightly oversized in the initial construction contract Higher initial costs compared to Alternatives No. 1 and 2 In-situ expansion requires the same equipment as initially installed
<b>Alternative 3A:</b> If the future demands are expected to occur sooner than the long term, a sub-option is presented as Alternative 3A. In this alternative, all four trains and six filters would be installed during the initial construction program. As in Alternative 3, only six RO skids would be installed.	Compared to Alternative 3, this would require only a slightly higher initial construction cost for a significantly higher capacity, since the buildings, concrete works, electrical systems, civil works, and buried piping would be common to both alternatives. The additional cost is therefore only for the additional mechanical equipment.	Alternative 3A will result in an initially over-sized facility with idle equipment. To exercise the equipment, operators will be required to rotate operation of the trains frequently.
<b>Alternative 4.</b> This alternative is somewhat similar in concept to Alternative 3, but is based on	Redundancy Highest degree of flexibility for future expansion Very low future costs	Building spaces extremely oversized in the initial construction contract

Alternatives	Advantages	Disadvantages
building all six trains of pre-treatment initially for in-situ expansion with the rest of the equipment at a later date, and constructing all other concrete structures needed for the future flows in the initial construction program. Alternative 4 therefore represents the lowest future construction requirements.	Takes advantage of construction contractor one-time mobilization costs	Very high initial costs compared to Alternatives No. 1, 2, and 3 In-situ expansion requires the same equipment as initially installed  High commitment of initial investment towards un-known future conditions
<b>Alternative 5. Strictly speaking, Alternative 5 is not a phasing scenario, but is developed to provide the context for incremental cost comparisons to other alternatives. Whereas, Alternative 1 represents the lowest initial cost, Alternative No. 5 represents the highest initial cost. This is based on constructing the entire AWPP facility, including equipment, to handle the buildout flows</b>	Redundancy Highest degree of flexibility for future expansion No future costs Takes advantage of construction contractor one-time mobilization costs	Extensive amount of idle equipment Highest initial costs compared to Alternatives No. 1, 2, 3, and 4  In-situ expansion requires the same equipment as initially installed  Highest commitment of initial investment towards un-known future conditions

The incremental costs were developed for each alternative (Table 12-15 and Table 12-16). The incremental costs are useful for comparing the magnitude of the cost differential amongst the alternatives, but as expected, the costs are linear with respect to installed capacity. Other criteria, such as environmental and social impacts, were recognized as being essentially constant in the long term across all phasing options and would have counted little with respect to the cost and risk implications of the different phasing options – as such they are not considered in the analysis.



**Table 12-15 Paired Comparison Analysis of Project Criteria**

	Initial Capital Cost	Future Capital Cost	Initial Capacity / Initial Cost Ratio	Ease of Future Expansion	Idle Equipment / Unused Bldg space	Reliability	Sum	Weight (%)
<b>Initial Capital Cost</b>		4	2	3	5	3	17	19
<b>Future Capital Cost</b>	2		2	2	4	2	12	13
<b>Initial capacity / Initial Cost Ratio</b>	4	4		4	4	3	19	21
<b>Ease of Future Expansion</b>	3	4	2		4	3	16	18
<b>Idle Equipment / Unused Bldg Space</b>	1	2	1	2		1	7	7
<b>Reliability</b>	3	4	3	3	5		18	20

Number Assigning:

much less important 2. somewhat less important 3. Neutral 4. somewhat more important 5. Much more important

**Table 12-16 Ranking of Project Alternatives**

	Weighting Factor <sup>(1)</sup>	Alternative 1	Alternative 2	Alternative 3	Alternative 3A	Alternative 4	Alternative 5
<b>Initial Capital Cost</b>	19%	3	3	2	2	1	1
<b>Future Capital Cost</b>	13%	1	1	2	2	3	3
<b>Initial Capacity / Initial Cost Ratio</b>	21%	2	3	2	3	1	1
<b>Ease of future expansion</b>	18%	1	1	2	2	3	3
<b>Idle Equipment / Unused bldg Space</b>	8%	3	3	3	2	1	1
<b>Reliability</b>	20%	1	2	3	3	3	1
<b>Total Score <sup>(2)</sup></b>		1.75	2.17	2.28	2.42	2.03	1.63
<b>Rank</b>		5	3	2	1	4	6

From paired comparison table

Higher score is most advantageous

(Point distribution is as follows: excellent = 3 points; moderate = 2 points; poor = 1 point)



Based on the normalized cost comparisons and the assessment of the importance of various criteria, Alternative 3A offers the best value and could be considered the preferred alternative. This alternative offers the greatest value by providing a mid-range capital cost while not over-committing to an unrealistic initial capacity.

Alternative 3A will provide up to 75,000 m<sup>3</sup>/day firm capacity (i.e., with redundancy), and will allow for a peak capacity of about 109,000 m<sup>3</sup>/day of finished water.

### 12.5.2 Ultraviolet Disinfection Options

The AWPP must provide for disinfection of bacteria, viruses, and pathogens such as *Giardia* and *Cryptosporidium*. These pathogens are found in wastewater effluent and often in rivers.

The presence of these pathogens is very transitory, with high concentrations following heavy rain events or upsets at wastewater treatment plants, followed by periods with little or no presence.

This hit-or-miss nature of the contamination means that water quality sampling may not detect periodic high concentrations.

This analysis reviews the UV disinfection options as presented in Table 12-17, examines the feasibility of UV-AOP, and makes a recommendation for inclusion of UV in the Basis of Design.

**Table 12-17 Description of the UV disinfection options**

UV Orientation	UV-AOP
<p><b>UV reactors can be installed on each filter effluent pipe (referred to as “filter UV”) or as a common process with fewer, larger reactors operating in parallel off of a common channel or manifold (referred to as “manifold UV”). The disadvantage with filter UV is that a separate reactor is needed for each filter, resulting in numerous units. And if one of the UV units is not in service, this essentially takes the filter out of service (if desired to maintain disinfection). In addition, each reactor requires a separate control panel, or space within a master panel, resulting in a more complex controls configuration and complicating the future expansion sequencing.</b></p> <p><b>Manifold UV can be less complex because fewer (but larger) reactors are usually needed. This does not interfere with filter operations and these reactors can be located in any convenient dedicated space downstream of the filters that may be available or that can be added to the construction program. For this reason, manifold UV is recommended.</b></p>	<p>UV-AOP is often used to oxidize taste and odor causing compounds related to surface water algae blooms, or for organics such as methyl tertiary butyl ether (MTBE) which is non-volatile and not removable by aeration. UV-AOP requires a significantly higher UV dose (and thus much higher energy input), along with a source for creating hydroxyl radicals (hydrogen peroxide typically).</p> <p>Because of the high power consumption, UV-AOP is normally only a seasonal practice, for example, during taste &amp; odor events when the UV lamps can be energized with additional power then reduced back to the UV disinfection dose when the T&amp;O event has passed.</p> <p>In addition to the very high power requirements, UV-AOP requires a hydroxyl radical source.</p>

At the preliminary design stage, alternatives related to orientation of the UV reactor (filter UV versus manifold UV) and the lamp pressure (LP versus MP) are normally evaluated. It is recommended to proceed with manifold UV.

Based on the results of cost analysis provided in Table 12-18, it is not recommended to consider UV-AOP. The cost is prohibitive, and other processes are in place (namely aeration, GAC filtration, and reverse osmosis) for addressing organics.

Medium pressure UV-disinfection is recommended as the most economic option when taking into account both capital and O&M costs.

Table 12-18 Cost Analysis Comparing UV Disinfection to UV-Advanced Oxidation

	VENDOR No. 1		VENDOR No. 2		VENDOR No. 3	
	Disinfection	AOP	Disinfection	AOP	Disinfection	AOP
<b>Lamp Type</b>	MP	MP	LPHO	LPHO	MP	LPHO
<b>Budget Equipment Cost</b>	\$691,000	\$409,000	\$660,000	\$1,400,000	\$321,000	\$2,340,000
<b>Electrical &amp; Lamp Replacement Costs</b>	\$12,600	\$809,200	\$28,000	\$302,500	\$40,200	\$1,080,900
<b>Period (yrs)</b>	20	20	20	20	20	20
<b>Interest Rate</b>	4	4	4	4	4	4
<b>Present Worth Factor</b>	13.59	13.59	13.59	13.59	13.59	13.59
<b>Present Worth of O&amp;M (\$)</b>	\$171,000	\$10,997,000	\$380,000	\$4,111,000	\$546,000	\$14,690,000
<b>Total Present Worth</b>	\$862,000	\$12,797,000	\$1,040,000	\$5,511,000	\$867,000	\$17,000

### 12.5.3 Clarification Alternatives

Surface water treatment plants typically include a clarification step following flocculation and preceding filtration. The purpose is to reduce the solids load to the filters and is essential when moderate or high coagulant doses and solids loadings are anticipated.

For the purposes of this analysis, two types of clarifiers have been considered: dissolved air flotation (DAF) and inclined plate settler (IPS). Both of the types are described in Table 12-19.

Table 12-19 Clarification Alternatives

Dissolved air flotation (DAF)	Inclined Plate Settler (IPS)
Dissolved air flotation (DAF) is a moderate rate or high rate process using micro-bubbles to float the coagulated and flocculated particles to the surface of the clarifier. The main disadvantage of DAF when compared to other technologies is that it is mechanically complex, capital expensive, and expensive to operate due to continuous recycle pumping. Also, it is not very well suited for high turbidity water or high coagulant doses. The practical limits of DAF for treating high turbidity are site specific because not all turbidity is the same. For example, turbidity associated with algae is easily treated by DAF process, but colloidal turbidity can challenge DAF when the turbidity exceeds 100 NTU.	Unlike DAF which floats sludge to the surface, an IPS process relies on gravity. Inclined plate settlers operate as a passive process, relying on gravity, and require very little mechanical equipment aside from the sludge collectors. For this reason, they are much simpler to operate and O&M costs are very low. They require a larger footprint compared to DAF because the hydraulic loading rate (based on plan area) is typically 7.2-12 m <sup>3</sup> /m <sup>2</sup> -hr. Civil and building costs are therefore higher compared to DAF, but equipment costs are relatively low.

These are recognized as small-footprint technologies with proven performance. Equipment suppliers were contacted for budgetary equipment and operating costs for both the DAF and IPS processes. In addition, building area cost and civil works (concrete and excavation) were calculated for both alternatives. The cost summary is shown in Table 12-20.

Table 12-20 Cost Comparison of DAF and Plate Settlers (\$USD).

	DAF	Plates
<b>Concrete</b>	\$585,000	\$1,080,000
<b>Building Superstructure Cost</b>	\$400,000	\$950,000
<b>Equipment*</b>	\$3,162,500	\$486,000
<b>Comparative Capital Cost (USD)</b>	\$4,147,500	\$2,516,000

	DAF	Plates
<b>kW/hrs/day</b>	2081	765
<b>Electrical Costs (\$/year)</b>	\$76,000	\$27,900
<b>Period</b>	20	20
<b>Interest Rate</b>	4	4
<b>Present Worth Factor</b>	13.59	13.59
<b>Present Worth of Electrical O&amp;M (\$)</b>	\$1,033,000	\$379,000
<b>Total Present Worth</b>	\$5,033,000	\$2,895,000
<b>* Basis of costs 90 m<sup>3</sup>/day. Costs include sludge thickeners for plate settlers</b>		

For the IPS process, because of the larger footprint, there will be higher building and concrete costs, and there is the cost of thickeners for the sludge.

However, the DAF equipment cost are considerably higher, and due to the continuous recycle pumping inherent in the DAF process, the O&M cost are much higher as well.

The DAF process is not recommended for the following reasons:

- Higher capital and life cycle costs compared to IPS.
- More mechanically complex, requiring greater operator skill.
- Not well suited for intermittent operations.
- Not well suited for heavy solids loads such as could high doses of coagulant.

## 12.5.4 Options for Preferred Reverse Osmosis Sizing and Technology

Reverse osmosis (RO) is a membrane separation technology selected for inclusion in the overall AWPP process. The purpose of the RO system is to provide a final barrier against organic and inorganic compounds and pathogens if not adequately removed by conventional processes. These include pesticides, nitrates, fluoride, and hardness.

The RO system will add capital cost to the project proportionate with the number of RO systems ("skids") and will also contribute heavily to the operations expense.

RO systems require high pressure pumping, and consumables such as cartridge filters, anti-scalants, and RO membranes add to the operating costs.

Therefore, there is a strong incentive to provide a strategy for minimizing the cost and O&M burden related to the RO system. These strategies are listed below.

- Consider nanofiltration in order to lower applied pressure.
- Provide a phasing plan for the RO system so as to not overcommit investments.

Table 12-21 provides description of Options for Preferred Reverse Osmosis Sizing and Technology.

**Table 12-21 Options for Preferred Reverse Osmosis Sizing and Technology**

Nanofiltration	Reverse Osmosis
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<p><b>For all practical purposes, NF is sometimes simply characterized as a “loose” RO membrane. Otherwise, an RO skid and an NF skid are indistinguishable. The main difference is that NF requires a lower feed pressure. NF is normally selected in low TDS applications (to remove hardness for example) and RO is normally used for higher TDS applications (such as brackish water or seawater).</b></p>	<p>In the future, should additional RO capacity be needed to meet the design demand of 75,000 m<sup>3</sup>/day, an additional 3-skids could be installed to sustain the 60% filtered water feed flow. The RO building, electrical room, and ancillary services (transfer pumps, CIP systems, and cartridge filters, for example) will be configured for future expansion. When demands approach 135,000 m<sup>3</sup>/day (as filtered water), if water quality has not improved it is still necessary to expand RO, up to three more skids can be added. However, since buildout conditions may occur well after the Tuul River water quality has improved,</p>
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Nanofiltration	Reverse Osmosis
	the six skids could operate at a 35% filtered water feed flow (or lower) and there would be no need to expand the RO facility.

RO is recommended for implementation due to high rejection of trace contaminants of concern, such as PCE and TCE. However, a phased approach can address this by delaying full-capacity installation of some advanced processes such as reverse osmosis or nanofiltration.

## 12.6 High Voltage Power Transmission Alternative Routes

The National Dispatcher Center issued in July 2019 calculations that 35 kV power from Songino substation would be adequate to supply all BWSE facilities. Transmission line route options were identified, and a schematic of high voltage power supply was developed. In October 2019, MOE issued the Technical Condition that was more comprehensive, requiring 110 kV power to supply BWSE within a much larger power distribution plan. This represents a major increase in scope that will need to be negotiated with MCA-Mongolia in consultation with MOE.

MCA-Mongolia will finance design and prepare an amendment to the Contract to address this expanded scope. Construction will be financed by the Government of Mongolia, most likely drawing on the funds that were committed under Compact II. Design for the high voltage power supply to BWSE will be prepared as a separate construction package (currently named CP-4), and will be tendered and constructed under a separate construction contract, not part of this construction contract. CP-4 would provide high voltage transmission lines and substations to feed power to the CP-2 and CP-3 infrastructure. However, as CP-4 design is not yet contracted as of this writing, with available information being limited to preliminary investigations intended to inform a design scope, the high voltage power supply and its potential impacts are not assessed in this ESIA report. Rather, high voltage power supply activities will be addressed in a supplemental ESIA expected to be issued in April 2021. The supplemental ESIA will update the BWSE ESIA with respect to the high voltage power supply activities and their anticipated environmental and social impacts.

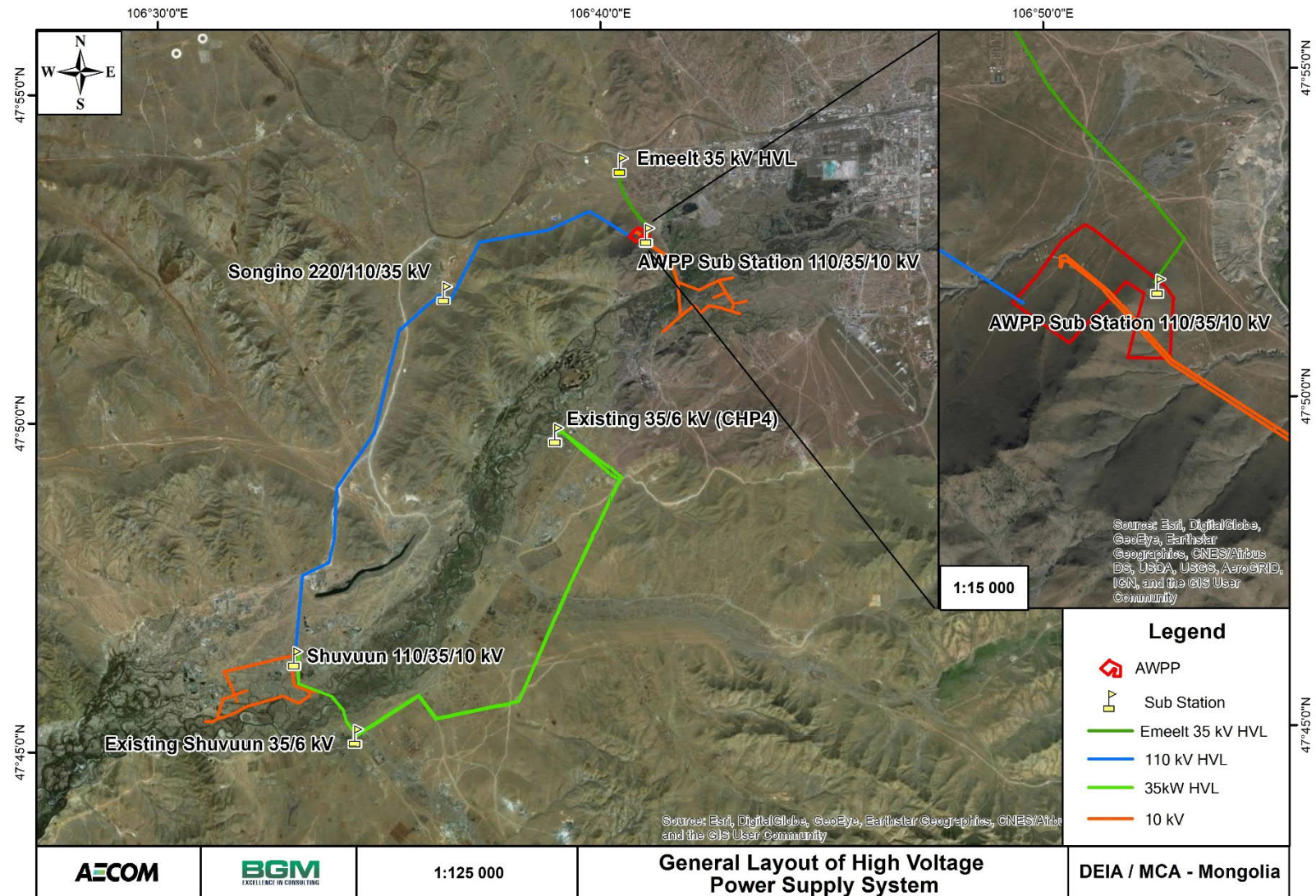
### 12.6.110 kV Power Supply and Distribution

The Final Design for the Biokombinat wellfield pump houses includes a 10 kV power supply from the proposed 110/35/10 kV substation at the AWPP, to the Biokombinat wellfield, plus 10 kV power distribution to individual well pump houses and the guardhouse within the Biokombinat wellfield.

The design for Shuvuun is based on the assumption that there will be a 110/35/10 kV substation or transformer just at the Shuvuun wellfield boundary. The 10 kV within the Shuvuun wellfield includes power distribution lines from the 110/35/10 kV substation to individual well pump houses and the guardhouse.

Figure 12-4 illustrates the general locations and conceptual routes of the high voltage power supply system required by the technical condition. It also shows the 10-kilovolt power transmission line from AWPP to the Biokombinat wellfield, and the 10-kilovolt power distribution systems in the Biokombinat and Shuvuun wellfields.

Comprises production well pump houses and a guard house at each wellfield (including all civil, structural, mechanical, electrical, and instrumentation components), raw water transmission branch and main pipelines from the well pump houses to the AWPP, and finished water transmission main pipelines from the AWPP to the existing water distribution network, as well as 10-kilovolt distribution lines within the two wellfields and the 10-kilovolt transmission line from the AWPP to the proposed Biokombinat wellfield.



**Figure 12-4 General Layout of High Voltage Power Supply System**

## 12.7 Access Roads Alternatives

It is proposed to provide access roads to the AWPP site, and to the Biokombinat wellfield and Shuvuun wellfield using existing roads and bridges where possible. In the BWSE project the following options have been considered for maintenance access roads for the Biokombinat wellfield, the Shuvuun wellfield, and the AWPP site (see Figure 12-5). Vehicle (passenger, utility and heavy construction) access is critical to the operation, inspection and maintenance of these facilities. AWPP and Wells operators and security staff will require access on a daily basis. Vehicles for service, maintenance and supply will require daily, weekly and monthly access. Access roads will provide emergency access for maintenance, repair or accidents at the AWPP and to wells and pipelines.

### 12.7.1 Biokombinat Wellfield

Two access routes have been considered:

- Option 1: Branch off from the paved Shuvuun highway, along dirt road through Biokombinat Town Center.
- Option 2: Branch off the paved Shuvuun highway, past Morin-davaa. This option will require bridges of 20 to 30 m across streams along the route at three points.

In the wellfield, road will be improved locally with cut and fill methods based on typical drawings. Culverts to drain water will be included where necessary. Design of access track improvements will be developed in conjunction with design of wellfield collection pipelines. Based on the evaluations presented earlier, AECOM recommends upgrading the existing dirt road from the Biokombinat Center. The advantages is that this is the shortest route, with the lower construction cost and a single stream crossing with a culvert. Ground conditions are better, with no marshy ground.

### 12.7.2 Shuvuun Wellfield

Two access route options were considered. Both alternatives for access to the Shuvuun wellfield branch from Shuvuun highway in the Ulziit area, cross the Tuul River Bridge and follow the existing paved road for a distance. The first alternative follows the existing road on the flood protection dike to the wellfield. The second alternative follows the railroad embankment, in the flood plain.

The access road will serve for maintenance and inspection access to wellfield and transmission pipeline for maintenance team during all weather conditions.

- **First option:** The proposed access road would be connected to the existing asphalt road that crosses the existing concrete bridge across the Tuul River. The proposed access road would be along the existing road on the flood protection dike to the wellfield. No culverts are necessary.
- **Second option:** The proposed access road would be connected to the asphalt road that crosses the existing concrete bridge across the Tuul River. The proposed access road would follow the existing quarry road for a distance, then follow the south side of the railway and run parallel to the artificial lake. It will be necessary to set up culvert crossings at 5-6 points along the route.

In the wellfield, road will be improved locally with cut and fill methods based on typical drawings. Culverts to drain water will be included where necessary. Design of access track improvements will be developed in conjunction with design of wellfield collection pipelines.



### 12.7.3 AWPP

Three access options have been considered:

- First option: Existing unpaved track running north from the AWPP and parallel to the proposed dual 900 mm Finished Water pipelines, then connecting to paved highway AH-3 western route. The route is 2.5 km long.
- Second option: From the AWPP connecting to the paved road to the north side of the Car Market. The route passes through soft, marshy ground, with multiple land owners. The route is 2.3 km long.
- Third option: The route connects AWPP to the south side of the Car Market, near the Tuul River. The muddy marshy ground will require bridges. The route is 2.6 km long.

The first alternative is to connect directly to the AH-3 highway, along the route of the proposed Finished Water dual pipelines. The second alternative is to construct a road to the east toward the north side of the existing Car Market. The third option is to construct a road to the south side of the Car Market. When developing options consideration must be given to the future planned Tuul highway and other planned roads. Tuul highway road design has been completed but is not yet built.

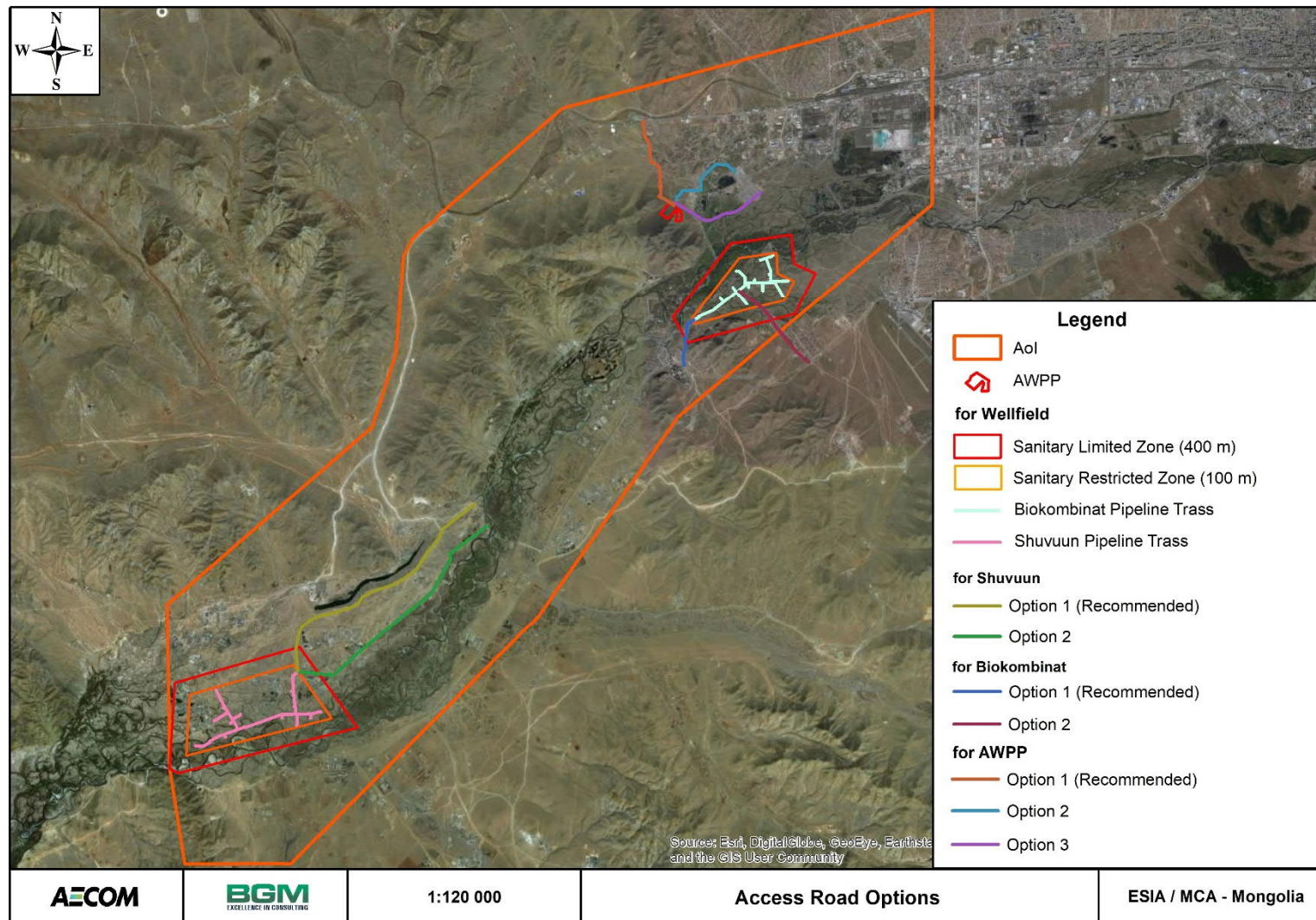
There are four new planned and designed public highways near the AWPP. The design of the access road to AWPP will need coordination with these future planned routes. Of three options, the first option is recommended.

The track is longer by 200 m but ranks highest on a three-track basis. The higher ground with no groundwater or marsh conditions results in lower cost of construction. This option has the least environmental and resettlement impacts, as it runs parallel to the proposed dual finished water pipeline. Also, this is the preferred option by the City Road Agency.

Routes two and three have poor quality wet soils, and high groundwater in low-lying areas.

The recommended option intersects two planned road designs. AECOM will consult with the design organizations and the Ulaanbaatar Road Development Department during the detailed design phase. The recommended route was submitted to the Ulaanbaatar Road Development Department and the department has sent an official letter to the City Development Office requesting the Working Order for design.

There will be over 12 workers at the AWPP who need access to main road (2.5 km). The road design will be parallel to the finished water pipeline route. Road design will account for four planned roads in the area.



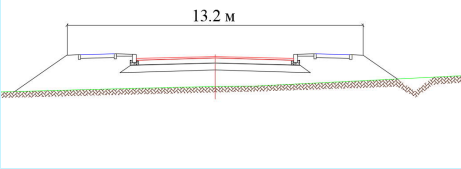
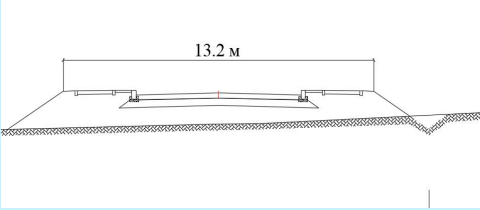
**Figure 12-5 Access Road Options**



## 12.7.4 Comparison of Types of Road Pavement

Two paving options were considered: asphalt pavement and improved gravel road. These are compared in Table 12-22.

**Table 12-22 Comparison of Asphalt and Improved Gravel Road**

Types of pavement	Asphalt pavement	Improved gravel road
<b>Cross section</b>		
<b>Planned Surface</b>	<ul style="list-style-type: none"> <li>Asphalt pavement 2 layers, 0.07 m</li> <li>Base course, 0.20 m</li> <li>Subbase course, 0.30 m</li> </ul>	<ul style="list-style-type: none"> <li>Gravel pavement, 0.20 m</li> <li>Base course, 0.30 m</li> </ul>
<b>Estimated Cost per 1 km</b>	330,000 USD	217,500 USD
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Smooth riding</li> <li>Preferred by Highway development agency of Ulaanbaatar</li> <li>In Mongolia where the ambient temperature varies from -40°C to + 40°C, engineers prefer flexible pavement vs. rigid concrete pavement.</li> </ul>	<ul style="list-style-type: none"> <li>Lower construction cost</li> <li>Maintenance cost of gravel road will be low if traffic intensity is low.</li> <li>Gravel surface will flex with freezing and thawing of subsurface, but maintenance with grader would be routine and not expensive.</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>Higher construction cost</li> <li>Impacts of frost and heavy trucking could damage asphalt surface and require expensive maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Dusty</li> <li>Uncomfortable</li> <li>Requires routine maintenance</li> </ul>

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## 13. Environmental and Social Management

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Appendices G, H, and I present the three ESMPs developed for the BWSE project, one for each of the wellfield (CP-1), AWPP (CP-2), and raw and finished water conveyance (CP-3) construction contract packages. The ESMP for high voltage power supply and heat supply (CP-4) will be developed during CP-4 design, which has not yet been contracted at the time of writing, and will be included in a supplemental ESIA expected to be issued in April 2021.

The ESMPs specify the management measures and associated monitoring that are to be implemented during preconstruction, construction, and operation and maintenance. As applicable, the ESMP management measures integrate the results of the public consultation and stakeholder engagement process. The ESIA team eliminated decommissioning from detailed study, because effectively the useful life of the BWSE will not end and the system will not be decommissioned. The management measures and monitoring specified in the ESMPs would be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA.

For each of the subject project phases or the overall ESMP, the ESMPs organize and summarize the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule
- Implementation Budget

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and costs into a workplan, schedule, and budget estimate for implementing the ESMP.

Appendix J presents the construction-phase management measures as environmental and social clauses for construction bids and specifications that are set forth in Section V, Works Requirements of the CP-1, CP-2, and CP-3 Construction Contract Documents. The construction-phase management measures presented in the ESMPs and in Appendix J have the full weight of technical specifications and must be adhered to by the contractors.

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## Appendix A Environmental Standards

**Table A-1 Mongolian Environmental and Health and Safety Standards**

Code	Standard
<b>MNS 17.0.0.06:1979</b>	The System of Standards for Environmental Protection and Basic Rules
<b>MNS 4191: 1993</b>	The System of Standards for Environmental Protection, Mongolian Climate, Basic Indicators
<b>MNS 4219: 1994</b>	The System of Standards for Environmental Protection, Ecological Passports, Basic Rule
<b>MNS ISO 14001: 2005</b>	Environmental Management System, Requirements with Guidance for Use
<b>MNS ISO 14004: 2005</b>	Environmental Management System, General Guidelines on Principles, Systems and Support Techniques
<b>MNS ISO 14015: 2001</b>	Environmental Management System, Location and Organization Assessment
<b>MNS ISO 14031: 2001</b>	Environmental Management, Environmental Performance Evaluation — Guidelines
<b>MNS ISO/TR 14032: 2001</b>	Environmental Management, Examples of Environmental Performance evaluation (EPE)
<b>MNS ISO 14050: 2003</b>	Environmental Management System, Glossary of Terms
<b>MNS 0900:2005</b>	Hygienic requirements and quality control for drinking water
<b>MNS 17.1.1.10:1979</b>	The Terms and Definitions for Water and Water Use
<b>MNS 4047:1988</b>	Guidelines for Monitoring of Surface Water Quality
<b>MNS 3342:1982</b>	The General Requirements for Protection of Underground Water from Pollution
<b>MNS 6148:2010</b>	Water Quality: The Permissible Level of Pollutants for Underground Water
<b>MNS ISO 5667 13 2000</b>	Water Quality-Sampling: Chapter 13: Sampling method for sludge from wastewater treatment plants
<b>MNS 0899:1992</b>	Sanitary Requirements for Sources of Water Supply to Urban and Household Purposes
<b>MNS 4943:2011</b>	Effluent Treated Wastewater. General Requirements
<b>MNS ISO 5667:1:2002</b>	Water Quality-Sampling: Chapter 1: Sampling method for drinking water
<b>MNS ISO 5667-3:1999</b>	Water Quality-Sampling: Chapter 3: Guidelines for handling of water samples
<b>MNS ISO 5667:6:2001</b>	Water Quality-Sampling: Chapter 6: Sampling method for rivers and streams
<b>MNS 4943:2015</b>	Water Quality: The General Requirements for Wastewater
<b>MNS BS 8525-1:2015</b>	The General Requirements for Grey Water
<b>MNS ISO 5667-10:2001</b>	Water Quality-Sampling: Chapter 10: Instructions for Sampling from Wastewater
<b>MNS ISO 5667-7:2002</b>	Water Quality-Sampling: Chapter 7: Instructions for Sampling from Water and Steam at Heat only Boilers (HOB)
<b>MNS 6561:2015</b>	Water Quality. General Requirements for Wastewater discharged to Sewerage Network
<b>MNS 5666:2006</b>	Water Biological Test: Determination Method of Dynamic Sludge ate Wastewater Treatment Plant
<b>MNS 4288:1995</b>	General Requirements for Location, Treatment Process and Levels of Wastewater Treatment Plant
<b>MNS 5582:2006</b>	The Technical Requirements for Wastewater from Tannery Industry Discharged into the Industrial Wastewater Pre-Treatment Plant
<b>MNS ISO 16075-1 2018</b>	The guidelines on the Use of Recycled Water for Greening Purposes with 4 chapters
<b>MNS 3297:1991</b>	Soil: Soil Quality Indicators and Norms in Urban Settlements
<b>MNS 5850:2008</b>	Soil Quality: The Permissible Levels of Soil Pollutants
<b>MNS 3298:1991</b>	Soil Quality: The General Requirements for Soil Sampling
<b>MNS 3985:1987</b>	Soil. Types of Sanitary Indicators of Soil

Code	Standard
<b>MNS 17.5.1.18:1983</b>	Environmental Protection: Rehabilitation of Eroded Land/Category of Eroded Land.
<b>MNS 17.5.1.19:1992</b>	Environmental Protection: The General Requirements for Rehabilitation of Eroded Lands
<b>MNS 3473:1983</b>	Environmental Protection. Land, Land Use and Terms and Definitions
<b>MNS 17.5.13:1980</b>	Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions
<b>MNS 5914:2008</b>	Environmental Protection: Rehabilitation of Eroded Land, Terms and Definitions
<b>MNS 5918:2008</b>	The General Technical Requirements for Vegetation of Eroded Land
<b>MNS 6458:2014</b>	The General Requirements for Handling Toxic and Hazardous Chemicals
<b>MNS 3474:2003</b>	Plant Protection: The Terms and Definitions
<b>MNS 5344:2011</b>	The General Requirements for Transportation of Household Wastes
<b>MNS 17.2.0.07:1979</b>	Air Pollutants and Category
<b>MNS 17.2.1.17:1980</b>	The Terms and Definitions of Industrial Pollutants to Atmosphere
<b>MNS 4585:2016</b>	Air Quality, The General Technical Requirements
<b>MNS 3383:1982</b>	The Terms and Definitions of Pollutant Sources for Atmosphere
<b>MNS 5885:2008</b>	The Permissible Level of Pollutant Substance to Air/General and Technical Requirements
<b>MNS 3113:1981</b>	The Technical Requirements for Determination of Air Emissions
<b>MNS 17.2.3.16:1988</b>	Guidelines for Monitoring of Air Quality in Urban Settlements
<b>MNS 6063:2010</b>	Air Quality: Permissible Level of Pollutants
<b>MNS ISO 14064-2:2015</b>	Greenhouse Gas- Second Chapter: Indicative Guidelines for Reporting and Monitoring on Changes and Adsorption of Greenhouse Emissions
<b>MNS 3384:1982</b>	The General and Technical Requirements for Sampling of Air Quality Test
<b>MNS 6298:2011</b>	Boiler Emissions Guidelines: The Permissible Level of Air Pollutants from Power and Heating Plants.
<b>MNS 5919:2008</b>	The Permissible Level of Air Pollutants from Operations of Water Heating and Steam Generating Facilities at Power and Heating Plants
<b>MNS 4219:2002</b>	Determination of Sulphur Content in Ambient Air
<b>MNS 5365:2004</b>	Fine Size Dust Determination Method
<b>MNS 4585:2016</b>	National Air Quality Standards and Parameters applies to urban areas
<b>MNS 4585:2016</b>	Permissible Noise Level
<b>MNS 0012-1-009:1985</b>	Standard for Noise Level in the Residential Areas and Civil Construction Sites
<b>MNS OIML R 102:2001</b>	The General Requirements for Sampling Noise
<b>MNS OIML R 103:2001</b>	The General Requirements for Sampling Vibration
<b>MNS 4968:2000</b>	Work Safety: General Requirements for Workplace
<b>MNS 4994:2000</b>	Work Safety: Vibrations Norm and General Requirements for Safe Operations
<b>MNS 5147:2002</b>	Electric and Static Conditions. Permissible Acid Level at Workplace
<b>MNS 5150:2002</b>	General Requirements for Safety Procedures with Electric Appliances
<b>MNS 5146:2002</b>	Work Safety: Electric Works; Protection and Wiring.
<b>MNS 5145:2002</b>	Electric Safety: The Maximum level of voltage and electric current
<b>MNS 5002:2000</b>	The General Requirements for Work Safety: The noise norms
<b>MNS 0012.4.005:1985</b>	The Labor Protection Equipment. Tools and Types
<b>MNS 4244:1994</b>	The General Requirements for Fire Safety
<b>MNS 5390:2004</b>	Work Safety and Sanitary Conditions
<b>MNS 5872:2008</b>	The Service Requirements for Power Supply
<b>MNS 5043:2011</b>	The General Technical Requirements for Boilers with capacity of 0.10 MBt - 3.15MBt
<b>MNS 5041:2001</b>	The General Technical Requirements for Boilers with capacity up to 100 κBt
<b>MNS 5045:2001</b>	The Technical Requirements for Water Heating Boiler with solid fuel
<b>MNS 5643:2006</b>	The General Technical Requirements for Power Transmission Sub Station with Capacity of 25-2500 κB•A

Code	Standard
<b>MNS 4084:1988</b>	The General Technical Requirements for Water Heating Unit with Solar Panel
<b>MNS 5207:2011</b>	The Technical Requirements for Installation of the Fiber Optic Cable
<b>MNS AASHTO 86:2005</b>	The Technical Requirements for Concrete Structure of Flood Protection Facilities
<b>MNS ISO 24511:2012</b>	Operation of Water Supply and Sewerage Network: Operations Management and Maintenance of the Sewerage Facilities
<b>MNS ISO 24512:2012</b>	Operations Management and Maintenance of the Water Supply Facilities
<b>MNS 5682:2006</b>	The Technical Requirements for Pedestrians and Access for Disable Persons
<b>MNS 4597:2014</b>	The Technical Requirements for Road Signs
<b>MNS 4759:2014</b>	The Technical Requirements for Road Marks
<b>MNS 4596:2014</b>	The Operational Instructions for Road Signs, Marks, Fences and Traffic Lights
<b>MNS 5342:2007</b>	The General Requirements for Parking Facilities

**Table A-2 Mongolian Ambient Air Quality Standards**

Pollutant	Averaging Period	Mongolian Standards ( $\mu\text{g}/\text{m}^3$ )	WHO ambient air quality guidelines (GL) and interim targets (IT), ( $\mu\text{g}/\text{m}^3$ )
<b>Nitrogen Dioxide (<math>\text{NO}_2</math>)</b>	20 minute	85	
	1 hour	-	200
	24 hour	40	-
	Annual	30	40
<b>Sulphur Dioxide (<math>\text{SO}_2</math>)</b>	10 minute	500	500 (GL)
	15 minute	-	-
	20 minute	450	-
	1 hour	-	-
	24 hour	20	125 (IT-1) 50 (IT-2) 20 (GL)
	Annual	10	-
<b>Particulate Matter (<math>\text{PM}_{10}</math>)</b>	24 hour	100	150 (IT-1) 100 (IT-2) 75 (IT-3) 50 (GL)
	Annual	50	70 (IT-1) 50 (IT-2) 30 (IT-3) 20 (GL)
<b>Particulate Matter (<math>\text{PM}_{2.5}</math>)</b>	24 hour	50	75 (IT-1) 50 (IT-2) 37.5 (IT-3) 25 (GL)
	Annual	25	35 (IT-1) 25 (IT-2) 15 (IT-3) 10 (GL)
<b>Carbon Monoxide (<math>\text{CO}</math>)</b>	30 minute	60,000	-
	1 hour	30,000	-
	8 hour	10,000	-
<b>Ozone (<math>\text{O}_3</math>)</b>	8 hour	100	160 (IT) 100 (GL)
<b>Lead (<math>\text{Pb}</math>)</b>	24 hour	1	-
	Annual	0.5	-
<b>Note: <math>\mu\text{g}/\text{m}^3</math> = micrograms per cubic meter of air.</b>			



**Table A-3 Mongolian Ambient Water Quality Standards**

Parameter	Unit	Standard
(pH)		6.5-8.5
Dissolved Oxygen (O <sub>2</sub> )	mgO/l	6&4 not less
BOD	mgO/l	3
COD	mgO/l	10
NH <sub>4</sub> -N	mgN/l	0.5
NO <sub>2</sub> -N	mgN/l	0.02
NO <sub>3</sub> -N	mgN/l	9
PO <sub>4</sub> - P	mgP/l	0.1
Chloride Cl	mg/l	300
Fluoride F	mg/l	1.2
SO <sub>4</sub>	mg/l	100
Manganese Mn	mg/l	0.1
Nickel Ni	mg/l	0.01
Copper Cu	mg/l	0.01
Molybdenum Mo	mg/l	0.25
Cadmium Cd	mg/l	0.005
Cobalt Co	mg/l	0.01
Lead Pb	mg/l	0.01
Arsenic As	mg/l	0.01
Total Chromium Cr	mg/l	0.05
Hexavalent chromium (Cr <sup>6+</sup> )	mg/l	0.01
Zinc Zn	mg/l	0.01
Mercury Hg	mg/l	0.1
Mineral oil	mg/l	0.05
Phenol	mg/l	0.001
Notes: mgO/l = milligrams oxygen per liter; mgN/l = milligrams nitrogen per liter; mgP/l = milligrams phosphorus per liter; mg/l = milligrams per liter. Source: MNS 4586:1998.		

**Table A-4 Mongolian Drinking Water Quality Standards**

Parameter	Unit	Standard
<b>Physical Quality</b>		
pH	mg/l	6.5-8.5
Hardness	mg equivalent/l	7.0
Total Dissolved Solids (TDS)	mg/l	1000.0
Turbidity	mg/l	1.5
Taste	Score	2.0
Odor	Score	2.0
Color	Degree	20
<b>Inorganic Quality</b>		
Molybdenum (Mo)	mg/l	0.07
Barium (Ba)	mg/l	0.7
Boron (B)	mg/l	0.5
Copper (Cu)	mg/l	1.0
Calcium (Ca <sup>2+</sup> )	mg/l	100.0
Magnesium (Mg <sup>2+</sup> )	mg/l	30.0
Manganese (Mn)	mg/l	0.1
Sodium (Na)	mg/l	200.0
Phosphate (PO <sub>4</sub> <sup>-</sup> )	mg/l	3.5
Fluoride (F)	mg/l	0.7-1.5
Selenium (Se)	mg/l	0.01
Strontium (Sr)	mg/l	2.0
Sulfate (SO <sub>4</sub> <sup>-</sup> )	mg/l	500.0
Chloride (Cl)	mg/l	350.0
Arsenic (As)	mg/l	0.01
Hydrogen sulfide (H <sub>2</sub> S)	mg/l	0.1
Chromium (Cr)	mg/l	0.05
Dry residue	mg/l	1000.0
Uranium (U)	mg/l	0.015
Beryllium (Be)	mg/l	0.0002
Cadmium (Cd)	mg/l	0.003
Total mercury (Hg)	mg/l	0.001
Total cyanide (CN <sup>-</sup> )	mg/l	0.01
Ammonium ion, (NH <sub>4</sub> <sup>+</sup> )	mg/l	1.5
Nitrate ion, (NO <sub>3</sub> <sup>-</sup> )	mg/l	50.0
Nitrite ions (NO <sub>2</sub> <sup>-</sup> )	mg/l	1.0
Phosphate ions, (PO <sub>4</sub> <sup>3-</sup> )	mg/l	3.5
Silver (Ag)	mg/l	0.1
Iodine (I <sub>2</sub> )	mg/l	1.0
Vinyl chloride	mg/l	0.0003
Nickel (Ni)	mg/l	0.02
Lead (Pb)	mg/l	0.01
Aluminum	mg/l	0.5
Antimony (Sb)	mg/l	0.02
Total iron (Fe)	mg/l	0.3
Zinc (Zn)	mg/l	5.0
<b>Organic Quality</b>		
Benzene	mg/l	0.01
Xylenes	mg/l	0.5

<b>Nitrile 3 acetic acid</b>	mg/l	0.2
<b>2 chlorinated methane</b>	mg/l	0.02
<b>2 chlorinated ethane</b>	mg/l	0.03
<b>3 chlorinated ethane</b>	mg/l	0.07
<b>4 chlorinated ethane</b>	mg/l	0.04
<b>Phenolic compounds</b>	mg/l	0.002
<b>Styrene</b>	mg/l	0.02
<b>Toluene</b>	mg/l	0.7
<b>Ethyl benzene</b>	mg/l	0.3
<b>Pesticides</b>		
<b>Atrazine</b>	mg/l	0.002
<b>Carbofuran</b>	mg/l	0.007
<b>Lindane</b>	mg/l	0.002
<b>Molinate</b>	mg/l	0.006
<b>Endrin</b>	mg/l	0.00006
<b>Microbial Quality</b>		
<b>Total Coliform</b>	Coli / ml	100 (at source) 20 (at supply)
<b>Escherichia coli (E. coli)</b>	E. coli / 100 ml	E. coli / 100 ml
<b>Radiological Quality</b>		
<b>Total α radioactivity</b>	Bq/l	0.1
<b>Total β radioactivity</b>	Bq/l	1.0
Notes: mg/l = milligrams per liter; ml = milliliter; Bq/l = becquerel per liter. Source: MNS 0900:2018.		

**Table A-5 Mongolia Effluent Wastewater Quality Standard**

Parameter	Unit	Standard
Water temperature	°C	20
pH	-	6-9
Odor	Sense	No smell
Total Suspended Solids (TSS)	mg/l	50
BOD	mg O <sub>2</sub> /l	20
COD	mg O <sub>2</sub> /l	50
Permanganate oxidizing capacity	mg O <sub>2</sub> /l	20
Total Dissolved Solids (TDS)	mg/l	1,000 *
Ammonia Nitrogen (NH <sub>4</sub> )	mg N/l	6
Total Nitrogen (TN)	mg/l	15
Total phosphorous (TP)	mg/l	1.5
Organic phosphorous (DOP)	mg/l	0.2
Hydrogen sulfide (H <sub>2</sub> S)	mg/l	0.5
Total iron (Fe)	mg/l	1
Aluminum (Al)	mg/l	0.5
Manganese (Mn)	mg/l	0.5
Total Chromium (Cr)	mg/l	0.3
Hexavalent chromium (Cr <sup>6+</sup> )	mg/l	Absent
Total cyanide (CN)	mg/l	0.05
Free cyanide	mg/l	0.005
Copper (Cu)	mg/l	0.3
Boron (B)	mg/l	0.3
Lead (Pb)	mg/l	0.1
Zinc (Zn)	mg/l	1
Cadmium (Cd)	mg/l	0.03
Antimony (Sb)	mg/l	0.05
Mercury (Hg)	mg/l	0.001
Molybdenum (Mo)	mg/l	0.5
Total Arsenic (As)	mg/l	0.01
Nickel (Ni)	mg/l	0.2
Selenium (Se)	mg/l	0.02
Beryllium (Be)	mg/l	0.001
Cobalt (Co)	mg/l	0.02
Barium (Ba)	mg/l	1.5
Strontium (Sr)	mg/l	2
Vanadium (V)	mg/l	0.1
Uranium (U)	mg/l	0.05
Oil and grease	mg/l	1
Fat	mg/l	5
Surface active agents	mg/l	2.5
Phenol (C <sub>6</sub> H <sub>5</sub> OH)	mg/l	0.05
Trichloroethylene (C <sub>2</sub> HCl <sub>3</sub> )	mg/l	0.2
Tetrachloroethylene	mg/l	0.1
Chlorine remains (Cl)	mg/l	1
Bacteria triggering water-borne disease	-	Absent in 1 mg of water
Notes: °C = degrees Celsius; mg/l = milligrams per liter; mgO <sub>2</sub> /l = milligrams dioxygen per liter; mgN/l = milligrams nitrogen per liter; mg = milligram.		
Source: MNS 4943:2011.		

**Table A-6 Mongolian Noise Standard**

Parameter	MNS dB(A)		WHO Guideline dB(A)	
	Daytime 07:00 – 23:00	Night 23:00 – 07:00	Daytime 07:00 – 22:00	Night 22:00 – 07:00
<b>Maximum Environmental Noise Exposure for the Public</b>	60	45	WHO Class I - Residential, institutional, educational: 55  WHO Class II - industrial, commercial: 70	WHO Class I - Residential, institutional, educational: 45  WHO Class II - industrial, commercial: 70
<b>Note:</b> dB(A) = A-weighted decibel(s). <b>Source:</b> MNS 4585:2016 and WHO Noise Quality Guidelines (1999) in IFC EHS Guidelines (2007).				

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## Appendix B Public Communication and Stakeholder Engagement Plan for BWSE

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### B.1 Introduction

An initial Stakeholder Engagement Plan (SEP) was developed for the project for the ESIA and RAP and presented in the Contract Work Plan (June 2019). Subsequently, a more comprehensive plan has been developed for implementation in the project going forward, and is presented here.

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

### B.2 Stakeholder Engagement Plan

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project. .

The Stakeholder Engagement Plan covers nine components:

1. Staffing and resources
2. Stakeholder Identification and Analysis
3. Information Disclosure
4. Stakeholder Consultation
5. Partnerships
6. Grievance Management
7. Stakeholder Involvement in Project Monitoring
8. Reporting to Stakeholders
9. Management Functions



## Staffing and Resources

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social license to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc., filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

## Stakeholder Identification Analysis

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

## Information Disclosure

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions
6. Derive a budget for information dissemination activities overall project phases.

## Stakeholder Consultation

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## Partnerships

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## Grievance Management

The Grievance Redress Mechanism is discussed in detail in section 11.4. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## Stakeholder Involvement in Project Monitoring

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

1. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
2. Observations by affected parties, triangulated to strengthen validation,
3. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
4. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## Reporting to Stakeholders

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

1. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
2. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
3. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
4. Make monitoring results publicly available, especially reports of any external monitors.
5. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
6. Derive an SOP for reporting to stakeholders.

## Management Functions

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

1. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a "risk" perspective
2. The hiring and training of community liaison officers
3. Consultation processes designed to meet the Project's own policies and/or compliance requirements of funders and regulators
4. Input and suggestions received from stakeholders on project design and proposed mitigation measures
5. Grievance mechanisms that capture and respond to stakeholder concerns

6. The involvement of local stakeholders in project monitoring
7. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals
- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field-level information in a timely manner. The more likely it is that the concerns of local

stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.



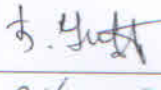

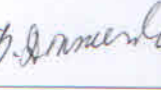
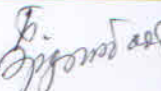
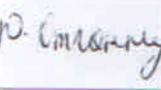



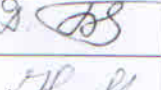

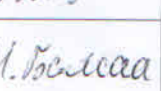


- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes – stakeholder relations becomes a collective responsibility.

## **B.3 Lists of Participants**













**Public consultation and Stakeholder  
Engagement Meeting  
Songino-Khairkhan District  
20<sup>th</sup> Khoroo**

2020.06.04

	Name		Organization	Position	Signature
No	Mongolian	English			
Local Government Representatives					
1	Хайдав Нэмэхбаяр	Nemekhbayar Khaidav	Songino Khaikhan district 20th khoroo Governors office	Governor	
2	Ядмаа Батнасан	Batnasan Yadmaa	Songino Khaikhan district 20th khoroo Governors office	Labor Welfare Officer	
3	Цэдэнбалжир Шинэхүү	Shinekhoo Tsedenbaljir	Songino Khaikhan district 20th khoroo Governors office	Social worker	
4	Б.Ундрахбаяр	Undrakhbayar. B	Songino Khaikhan district 20th khoroo Governors office	Media officer	
5	Пүрэв Халиунсүрэн	Khaliunsuren Purev	Songino Khaikhan district 20th khoroo Governors office	Manager	
6	Банзрагч Должинсүрэн	Doljinsuren Banzragch	Songino Khaikhan district 20th khoroo Governors office	Иргэний тэнхимийн ажилтан	
7	Баатар Эрдэнэбаатар	Erdenebaatar Baatar	20th Khoroo, Songino Khaikhan District	Chairman of Citizen's representative meeting	
8	Юра Отгонтүяа	Otgontuya Yura	Songino Khaikhan district 20th khoroo Governors office	Үйлчлэгч	
9	Б.Атарбаяр	Atarbayar. B	Songino Khaikhan district 20th khoroo Governors office	Төхижилт олон нийтийн байцаагч	
10	Гомбожав Нэмэхбаяр	Nemehbayar Gombojav	20th Khoroo, Songino Khaikhan District	Kheseg leader	
11	Идэш Оюунчимэг	Oyunchimeg Idesh	20th Khoroo, Songino Khaikhan District	Kheseg leader	
12	Дашцэдэн Батсүх	Batsukh Dashtseren	20th Khoroo, Songino Khaikhan District	Kheseg leader	
13	Пунцаг Нямжав	Nyamjav Puntsag	20th Khoroo, Songino Khaikhan District	Kheseg leader	
14	Жадамба Цогзолмаа	Tsogzolmaa Jadamba	20th Khoroo, Songino Khaikhan District	Kheseg leader	
15	Чогсом Баясгалан	Bayasgalan Chogsom	20th Khoroo, Songino Khaikhan District	Kheseg leader	
16	Даваасүрэн Ариунаа	Ariunaa Davaasuren	20th Khoroo, Songino Khaikhan District	Kheseg leader	
17	Борбаатар Баярцэцэг	Bayartsetseg Borbaatar	20th Khoroo, Songino Khaikhan District	Kheseg leader	

18	Цэрэнчимэд Золзаяа	Zolzaya Tserenchimed	20th Khoroo, Songino Khairkhan District	Kheseg leader	<i>U. Zash</i>
16	Монхор Лхамдэгд	Lkhamdegd Monkhor	20th Khoroo, Songino Khairkhan District	Elder	
17	Насантогтох Долгорсүрэн	Dolgorsuren Nasantogtokh	20th Khoroo, Songino Khairkhan District	Elder	<i>Dolgor</i>
18	Чулуун Амаржаргал	Amarjargal Chuluun	20th Khoroo, Songino Khairkhan District	Youth representative	
19	Дондовдорж Долгор	Dondovdorj Dolgor	20th Khoroo, Songino Khairkhan District	Youth representative	
20	Жамбалжав Должинсүрэн	Doljinsuren Jambaljav	20th Khoroo, Songino Khairkhan District	Women representative	<i>Жамбал</i>
21	Данзан Мөнхжаргал	Munkhjargal Danzan	20th Khoroo, Songino Khairkhan District	Elder	<i>Danzan</i>
22	Дамба Лхамжав	Lkhamjav Damba	20th Khoroo, Songino Khairkhan District	Elder	
23	Гомбожав Дулам	Dulam Gombojav	20th Khoroo, Songino Khairkhan District	Elder	<i>Gomjav</i>
24	Хүүж Наранцэцэг	Narantsetseg Khuuj	20th Khoroo, Songino Khairkhan District	Elder	<i>Naran</i>
25	Цэвээн Отгонгэрэл	Otgongerel Tseveen	20th Khoroo, Songino Khairkhan District	Youth representative	<i>Otgongerel</i>
26	Пүрэвээ Отгонжаргал	Otgonjargal Purevee	20th Khoroo, Songino Khairkhan District	Youth representative	<i>Purevee</i>
27	Чулуун Отгонтүүл	Otgontuul Chuluun	20th Khoroo, Songino Khairkhan District	Youth representative	
28	Цэрэнчимэд Аззаяа	Azzaya Tserenchimed	20th Khoroo, Songino Khairkhan District	Youth representative	<i>Azzaya</i>
29	Ганжуур Цэнд	Tsend Ganjuur	20th Khoroo, Songino Khairkhan District	Female headed family representative	
30	Ширчин Даваасүрэн	Davaasuren Shirchin	20th Khoroo, Songino Khairkhan District	Female headed family representative	<i>Shirchin</i>
31	Бавуудорж Мягмарсүрэн	Myagmarsuren Bavuudorj	20th Khoroo, Songino Khairkhan District	Women representative	<i>Myagmarsuren</i>
32	Лхамсүрэн Наранцэцэг	Narantsetseg Lkhamsuren	20th Khoroo, Songino Khairkhan District	Elder	<i>Narantsetseg</i>
33	П.Эрдэнэхүү	Erdenekhuu. P	20th Khoroo, Songino Khairkhan District	Elder	







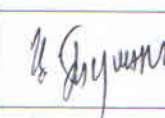



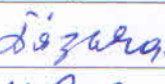

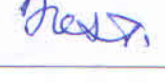



34	А.Цогтсайхан	Tsogtsaikhan. A	20th Khoroo, Songino Khaikhan District	Elder	
35	Зундуй Мягмаржав	Myagmarjav Zundui	20th Khoroo, Songino Khaikhan District	Elder	
36	Наранцэцэг Сэлэнгэ	Selenge Narantsetseg	20th Khoroo, Songino Khaikhan District	Youth representative	
37	Ж.Сүхбат	Sukhbat. J	20th Khoroo, Songino Khaikhan District	Youth representative	
38	Цэрэнсодном Хоролхүү	Khorolkhuu Tserensodnom	20th Khoroo, Songino Khaikhan District	Youth representative	
39	Оюунтуяа Хишигжаргал	Khishigjargal Oyuntuya	20th Khoroo, Songino Khaikhan District	Youth representative	
40	Хадбаатар Ууганцэцэг	Uugantsesteg Khadbaatar	20th Khoroo, Songino Khaikhan District	Female headed family representative	
41	А.Оюунчимэг	Oyunchimeg. A	20th Khoroo, Songino Khaikhan District	Female headed family representative	
42	Оюунцэцэг Энхсайхан	Enkhsaikhan Oyuntsetseg	20th Khoroo, Songino Khaikhan District	Women representative	
43	Пүрэвжав Баасанцэрэн	Baasantseren Purevjav	20th Khoroo, Songino Khaikhan District	Elder	
44	Цэндорж Лхагвасүрэн	Lkhagvasuren Tsendorj	20th Khoroo, Songino Khaikhan District	Elder	
45	Бадамгарав Сарантуяа	Sarantuya Badamgarav	20th Khoroo, Songino Khaikhan District	Elder	
46	Нацаг Түүхбаатар	Tuukhbaatar Natsag	20th Khoroo, Songino Khaikhan District	Elder	
47	Мөнхтөр Дэмбэрэлсүрэн	Demberelsuren Munkhtur	20th Khoroo, Songino Khaikhan District	Youth representative	
48	Рэнцэн Гантулга	Gantulga Rentsen	20th Khoroo, Songino Khaikhan District	Youth representative	
49	Түвшинжаргал Цэвэлмаа	Tsevelmaa Tuvshinjargal	20th Khoroo, Songino Khaikhan District	Youth representative	
50	Ганболд Болдбаатар	Boldbaatar Ganbold	20th Khoroo, Songino Khaikhan District	Youth representative	
51	Д.Хөхөө	Khukhuu. D	20th Khoroo, Songino Khaikhan District	Female headed family representative	
52	Лувсандагва Сэрээдорж	Sereedorj Luvsandagva	20th Khoroo, Songino Khaikhan District	Women representative	
53	Сүхбат Элбэгбат	Elbegbat Sukhbat	20th Khoroo, Songino Khaikhan District	Female headed family representative	

54	Ганзориг	Ganzorig	20th Khoroo, Songino Khairkhan District	Businessman, Khurimt shop	
55			20th Khoroo, Songino Khairkhan District	Businessman, Bab invest LLC	
56	Э. Мөнхтуул	Munkhtuul. E	20th Khoroo, Songino Khairkhan District	Businessman	<i>Э. Мөнхтуул</i>
57	С.Пүрэвсүрэн	Purevsuren. S	20th Khoroo, Songino Khairkhan District	Businessman, Tavan Erdene LLC	<i>С. Пүрэвсүрэн</i>
58	<i>И. Цэвэглэ</i>		20th Khoroo, Songino Khairkhan District		<i>И. Цэвэглэ 3</i>
59	<i>Т. Цэвэглэ</i>		20th Khoroo, Songino Khairkhan District		<i>Т. Цэвэглэ 3</i>
60	<i>М. Талмэн</i>		20th Khoroo, Songino Khairkhan District		<i>М. Талмэн 3</i>
61	<i>Т. Анугаро</i>		20th Khoroo, Songino Khairkhan District		<i>Т. Анугаро 3</i>
62	<i>П. Анугаро</i>		20th Khoroo, Songino Khairkhan District		<i>П. Анугаро 3</i>
63	<i>Оюунболор</i>		20th Khoroo, Songino Khairkhan District		<i>Оюунболор 3</i>
64	<i>Шооцэрэн</i>		20th Khoroo, Songino Khairkhan District		<i>Шооцэрэн 3</i>
65	<i>Ц. Нарантула</i>		20th Khoroo, Songino Khairkhan District		<i>Ц. Нарантула 3</i>
66	<i>Т. Тоосүвэг</i>		20th Khoroo, Songino Khairkhan District		<i>Т. Тоосүвэг 3</i>
67	<i>Э. Хорин</i>		20th Khoroo, Songino Khairkhan District		<i>Э. Хорин 3</i>
68	<i>Сарансүрэн</i>		20th Khoroo, Songino Khairkhan District		<i>Сарансүрэн 3</i>
69	<i>Оюунболор</i>		20th Khoroo, Songino Khairkhan District	4-46	<i>Оюунболор 3</i>
70	<i>Инбаатар</i>		20th Khoroo, Songino Khairkhan District		<i>Инбаатар 3</i>

**Public consultation and Stakeholder  
Engagement Meeting  
Songino-Khairkhan District  
22<sup>nd</sup> Khoroo**

2020.05.22



	Name		Organization	Position	Signature
№	Mongolian	English			
Local Government Representatives					
1	Жигмэд Рэнчиндорж		Songino Khairkhan district 22nd khoroo Governors office	Manager	
2	Туул		Songino Khairkhan district 22nd khoroo Governors office	Manager	
3	Олонбаяр Мөнхбаяр		Songino Khairkhan district 22nd khoroo Governors office	Labor Welfare Officer	
4	Жамбадорж Дааманцогзол		Songino Khairkhan district 22nd khoroo Governors office	Social worker	
5	Цэгмид Түмэнжаргал		Songino Khairkhan district 22nd khoroo Governors office	State Registration Officer	
6	Цэгмид Түмэнжаргал		Songino Khairkhan district 22nd khoroo Governors office	Public Worker	
7	Баатар Замбал		22nd Khoroo, Songino Khairkhan District	Elder	
8	Шарав Наранбаяр		22nd Khoroo, Songino Khairkhan District	Elder	
9	Рагчаа Бямбажав		22nd Khoroo, Songino Khairkhan District	Elder	
10	Лханаасүрэн Цэцэгмаа		22nd Khoroo, Songino Khairkhan District	Elder	
11	Бизъяа		22nd Khoroo, Songino Khairkhan District	Elder	
12	Чадраа Энхтуяа		22nd Khoroo, Songino Khairkhan District	Elder	
13	Цэрэнтогтох Энхтуяа		22nd Khoroo, Songino Khairkhan District	Elder	
14	Бүдбазар Цэрэнжав		22nd Khoroo, Songino Khairkhan District	Elder	
15	Цэсэндэг		22nd Khoroo, Songino Khairkhan District	Elder	
30	Төмөр Оюунчимэг		22nd Khoroo, Songino Khairkhan District	Female headed family representative	

31	Бадрах Нямаа		22nd Khoroo, Songino Khairkhan District	Female headed family representative	
32	Шарав Наранбаяр		22nd Khoroo, Songino Khairkhan District	Female headed family representative	
33	Мишиг Мөнхмаа		22nd Khoroo, Songino Khairkhan District	Female headed family representative	
34	Шагдар Должинсүрэн		22nd Khoroo, Songino Khairkhan District	Female headed family representative	<i>W. D. J. J.</i>
35	Ганболд Мөнх Эрдэнэ		22nd Khoroo, Songino Khairkhan District	Businessman	<i>M. N. J. J.</i>
36	А. Отгондулам		22nd Khoroo, Songino Khairkhan District	Businessman	
37	Д. Энхжаргал		22nd Khoroo, Songino Khairkhan District	Businessman	
38	Оюунтуяа		22nd Khoroo, Songino Khairkhan District	Businessman	
39	<i>Д. Вушигдун</i>		22nd Khoroo, Songino Khairkhan District	<i>Хнийн амарт</i>	<i>W. D. J. J.</i>
40	<i>О. Норагучи</i>		22nd Khoroo, Songino Khairkhan District	<i>ОНБ</i>	<i>W. D. J. J.</i>
41	<i>С. Бааларын</i>		22nd Khoroo, Songino Khairkhan District	<i>Хөгчийн амарт</i>	<i>W. D. J. J.</i>
42	<i>Р. Цэцэгмуну</i>		22nd Khoroo, Songino Khairkhan District	<i>Х/ахавт.</i>	<i>W. D. J. J.</i>
43	<i>Е. Савханцзья</i>		22nd Khoroo, Songino Khairkhan District	<i>Х-ахавт</i>	<i>W. D. J. J.</i>
44	<i>Содвийн Оюунцэцэг</i>		22nd Khoroo, Songino Khairkhan District	<i>Elder.</i>	<i>W. D. J. J.</i>
45	<i>Урлз Батсүх</i>		22nd Khoroo, Songino Khairkhan District	<i>Elder.</i>	<i>W. D. J. J.</i>
46	<i>Содов Озгорсүх</i>		22nd Khoroo, Songino Khairkhan District	<i>Elder.</i>	<i>W. D. J. J.</i>

47. *У. Цэцэгмуну*

*Elder. W. D. J. J.*

48. *А. Тимсээн*

*Elder. W. D. J. J.*

49. *Даван Аюуш*

*Elder. W. D. J. J.*

50. *Даван Оюун*

*Elder. W. D. J. J.*

51. *Тогтоохуу  
Томорбаатар*

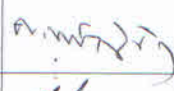







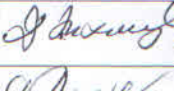





*W. D. J. J.*

52.

**Public consultation and Stakeholder  
Engagement Meeting  
Songino-Khairkhan District  
32<sup>nd</sup> Khoroo**

2020.05.06



Name			Organization	Position	Signature
No	Mongolian	English			
Local Government Representatives					
1	Ванчиг Сүхбаатар	Sukhbaatar Vanchig	Songino Khairkhan district 32nd khoroo Governors office	Governor	
2	Батсайхан Намжилмаа	Namjilmaa Batsaikhan	Songino Khairkhan district 32nd khoroo Governors office	Leader of working group	
3	Бунжаа Даваахүү	Davaakhuu Bunjaa	Songino Khairkhan district 32nd khoroo Governors office	Manager	
4	Цогтоо Цэлмэг	Tselmeg Tsogtoo	Songino Khairkhan district 32nd khoroo Governors office	Social worker	
5	Жаргалсайхан Хашэрдэнэ	Khasherdene Jargalsaikhan	Songino Khairkhan district 32nd khoroo Governors office	Media officer	
6	Сэмбэсүрэн Уянга	Uyanga Sembesuren	Songino Khairkhan district 32nd khoroo Governors office	Иргэний танхимын ажилтан	
7	Дорлиг Уранчимаг	Uranchimeg Dorlig	Songino Khairkhan district 32nd khoroo Governors office	Үйлчлэгч	
8	Баярмагнай Жалхаанямсан	Jalkhaanyamsan Bayarmagnai	Songino Khairkhan district 32nd khoroo Governors office	Security	
9	Базгад Батцэцэг	Battsetseg Bazgad	32nd Khoroo, Songino Khairkhan District	Chairman of Citizen's representative meeting	
10	Дэжид Энхтуяа	Enkhtuya Dejid	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
11	Дашням Бямбаа	Byambaa Dashnyam	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
12	Галдан Бямбасүрэн	Byambasuren Galdan	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
13	Чүлтэмсүрэн Солонго	Solongo Chultemsuren	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
14	Баньд Солонго	Solongo Banid	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
15	Очирбат Солонго	Solongo Ochirbat	32nd Khoroo, Songino Khairkhan District	Kheseg leader	
Local Community Representative					
16	Шарав Хишигсүрэн	Khishigsuren Sharav	32nd Khoroo, Songino Khairkhan District	Elder	
17	Даваа Отгон	Otgon Davaa	32nd Khoroo, Songino Khairkhan District	Elder	
18	Батмөнх Баточир	Batochir Batmunkh	32nd Khoroo, Songino Khairkhan District	Elder	

19	Лувсан Нарангэрэл	Narangerel Luvsan	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
20	Энхбаатар Дамдинбазар	Damdinbazar Enkhbaatar	32nd Khoroo, Songino Khaikhan District	Youth representative	
21	Энхбаатар Хүрэлбат	Khurelbat Enkhbaatar	32nd Khoroo, Songino Khaikhan District	Youth representative	<i>[Signature]</i>
22	Байгаль Буяндэлгэр	Buyandelger Baigali	32nd Khoroo, Songino Khaikhan District	Female headed family representative	<i>[Signature]</i>
23	Лувсанжамц Наранчимэг	Naranchimeg Luvsanjamts	32nd Khoroo, Songino Khaikhan District	Female headed family representative	
24	Жамъянсүрэн Лхагвасүрэн	Lkhagvasuren Jamiyansuren	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
25	Бадам Дуламжав	Dulamjav Badam	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
26	Долгор Аюуш	Ayush Dolgor	32nd Khoroo, Songino Khaikhan District	Elder	
27	Довдон Бямбасайхан	Byambasaikhan Dovdon	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
28	Энхтуул Байгалмаа	Baigalmaa Enkhtuul	32nd Khoroo, Songino Khaikhan District	Youth representative	
29	Нарангэрэл Бямбажаргал	Byambajargal Narangerel	32nd Khoroo, Songino Khaikhan District	Youth representative	<i>[Signature]</i>
30	Жовд Жавдан Нансалмаа	Nansalmaa Jovd	32nd Khoroo, Songino Khaikhan District	Female headed family representative	<i>[Signature]</i>
31	Дандар Тэгшжаргал	Tegshjargal Dandar	32nd Khoroo, Songino Khaikhan District	Women representative	<i>[Signature]</i>
32	Гомбосүрэн Сүнжидмаа	Sunjidmaa Gombosuren	32nd Khoroo, Songino Khaikhan District	Elder	
33	Бавгар Бүтэд	Buted Bavgar	32nd Khoroo, Songino Khaikhan District	Elder	
34	Нацаг Должин	Doljin Natsag	32nd Khoroo, Songino Khaikhan District	Elder	
35	Алгаа Эрдэнэбилэг	Erdenebileg Alгаа	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
36	Жигжид Баяраа	Bayraa Jigjid	32nd Khoroo, Songino Khaikhan District	Youth representative	<i>[Signature]</i>
37	Баяр Амарсанаа	Amarsanaa Bayar	32nd Khoroo, Songino Khaikhan District	Youth representative	<i>[Signature]</i>
38	Дамдин Лхамаа	Lkhamaa Damdin	32nd Khoroo, Songino Khaikhan District	Female headed family representative	<i>[Signature]</i>
39	Бямбаа Болорцэцэг	Bolortsetseg Byambaa	32nd Khoroo, Songino Khaikhan District	Women representative	<i>[Signature]</i>
40	Бадарч Ичинхорлоо	Ichinkhorloo Badarch	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>
41	Дагва Цэнд	Tsend Dagva	32nd Khoroo, Songino Khaikhan District	Elder	<i>[Signature]</i>



42	Сэрээтэр Дарьханд	Darikhand Sereeter	32nd Khoroo, Songino Khairkhan District	Elder	
43	Доож Баасансүрэн	Baasansuren Dooj	32nd Khoroo, Songino Khairkhan District	Elder	
44	Санжаахүү Мягмарсүрэн	Myagmarsuren Sanjaakhuu	32nd Khoroo, Songino Khairkhan District	Youth representative	<i>Мягмарсүрэн</i>
45	Сүхбат Пүрэвмаа	Purevmaa Sukhbat	32nd Khoroo, Songino Khairkhan District	Youth representative	<i>Сүхбат</i>
46	Хэнчбиш Март	Mart Khenchbish	32nd Khoroo, Songino Khairkhan District	Female headed family representative	
47	Октябрь Тогос	Togos Oktyabri	32nd Khoroo, Songino Khairkhan District	Women representative	
48	Баттулга Цэрэнчанаа	Tserenchanaa Battulga	32nd Khoroo, Songino Khairkhan District	Youth representative	<i>Баттулга</i>
49	Бадамсүрэн Батболд	Batbold Badamsuren	32nd Khoroo, Songino Khairkhan District	Youth representative	<i>Бадамсүрэн</i>
50	Гүнчин Атарцэцэг	Atartsetseg Gunchin	32nd Khoroo, Songino Khairkhan District	Female headed family representative	
51	Цог Энхтайван	Enkhtaivan Tsog	32nd Khoroo, Songino Khairkhan District	Female headed family representative	
52	<i>Тогтоа Батболд</i>	<i>Batbold Togtokh</i>	32nd Khoroo, Songino Khairkhan District	Businessman, <del>Yoon</del> Bulag LLC	<i>Батболд</i>
53			32nd Khoroo, Songino Khairkhan District	Businessman, Ev Eye LLC	<i>Ev Eye</i>
54	Готов Энэбиш	Enebish Gotov	32nd Khoroo, Songino Khairkhan District	Businessman	<i>Готов</i>
55	Батжаргал Ганболд	Ganbold Batjargal	32nd Khoroo, Songino Khairkhan District	Businessman	
56	<i>Лувсангомбо Дэмбэрэл</i>	<i>Luvсангомбо Demberel</i>	32nd Khoroo, Songino Khairkhan District	Elder	<i>Д</i>
57	<i>Очирбат Болорхарлоо</i>	<i>Ochirbat Bolorkharloo</i>	32nd Khoroo, Songino Khairkhan District	Herseg leader	<i>Очирбат</i>
58	<i>Хорлоо Уранчимэг</i>	<i>Khorloo Uranchimeg</i>	32nd Khoroo, Songino Khairkhan District	Elder	<i>Хорлоо</i>
59	<i>Байрмагтай Мархаа Мунсан</i>		32nd Khoroo, Songino Khairkhan District	Elder	<i>Байрмагтай</i>
60	<i>Гомбогсүрэн Долгормаа</i>	<i>Gombogsuren Dolgormaa</i>	32nd Khoroo, Songino Khairkhan District	Elder	<i>Долгормаа</i>
61	<i>Чогдон Даваадулам</i>	<i>Chogdon Davaadulam</i>	32nd Khoroo, Songino Khairkhan District	Elder	<i>Чогдон</i>
62	<i>Баяраа Цагаанаа</i>	<i>Bayaraa Tsagaanaa</i>	32nd Khoroo, Songino Khairkhan District	Youth Rep	<i>Баяраа</i>

63. *Нантхуар*

*Н*

*32nd Khoroo  
15-17th floor*

*НБДТ*

*НБДТ*

64. *Дулмаа*

*Dulmaa*

*Elder*

*Дулмаа*

65. *П. Чулуун*

*P. Chuluun*



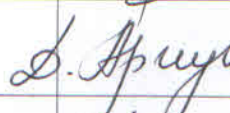
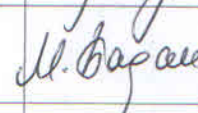







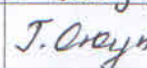



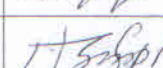


*Elder*

*Чулуун*















**Public consultation and Stakeholder  
Engagement Meeting  
Khan-Uul District  
13<sup>th</sup> Khoroo**

2020.05.06

	Name		Organization	Position	Signature
No	Mongolian	English			
Local Government Representatives					
1	А.Одбаяр	ODBAYAR. A	Khan Uul district 13th khoroo Governors office	Governor	
2	Н.Отгонбаяр	OTGONBAYAR. N	Khan Uul district 13th khoroo Governors office	Leader of working group	
3	Д.Ариунтунгалаг	ARIUNTUNGALAG. D	Khan Uul district 13th khoroo Governors office	Manager	
4	М.Бадамханд	BADAMKHAND. M	Khan Uul district 13th khoroo Governors office	Social worker	
5	Б.Азхүү	AZKHUU. B	Khan Uul district 13th khoroo Governors office	Media officer	
6	Д.Норовням	NOROVNYAM. D	13th Khoroo, Khan Uul District	Chairman of Citizen's representative meeting	
7	Ж.Энхжаргал	ENKHJARGAL. J	13th Khoroo, Khan Uul District	Kheseg leader	
8	Ц.Мөнгөнцэцэг	MUNKHTSETSEG. TS	13th Khoroo, Khan Uul District	Kheseg leader	
9	Д.Ганчимэг	GANCHIMEG. D	13th Khoroo, Khan Uul District	Kheseg leader	
10	Л.Насансүрэн	NASANSUREN. L	13th Khoroo, Khan Uul District	Kheseg leader	
11	З.Энхцэцэг	ENKHTSETSEG. Z	13th Khoroo, Khan Uul District	Kheseg leader	
12	Г.Оюун	OYUN. G	13th Khoroo, Khan Uul District	Kheseg leader	
13	С.Туул	TUUL. S	13th Khoroo, Khan Uul District	Kheseg leader	
14	Ш.Нарантуяа	NARANTUYA. SH	13th Khoroo, Khan Uul District	Kheseg leader	
Local Community Representatives					
15	Л.Нямхүү	NYAMKHUU. L	13th Khoroo, Khan Uul District	Elder	
16	П.Зэсэнсүрэн	ZESENSUREN. P	13th Khoroo, Khan Uul District	Elder	
17	Ю.Эрдэнэчимэг	ERDENECHIMEG. YU	13th Khoroo, Khan Uul District	Herder	
18	Д.Төмөржамба	TUMURJAMBA. D	13th Khoroo, Khan Uul District	Female headed family representative	
19	Д.Аюур	AYUR. D	13th Khoroo, Khan Uul District	Farmer	

20	Ч.Баяраа	BAYARAA. CH	13th Khoroo, Khan Uul District	Elder	28/07/11
21	Д.Оюун	OYUN. D	13th Khoroo, Khan Uul District	Elder	20/07/11
22	Л.Саран	SARAN. L	13th Khoroo, Khan Uul District	Herder	Саран
23	Ж.Ундармаа	UNDARMAA. J	13th Khoroo, Khan Uul District	Women representative	Ж.Ундармаа
24	Д.Хүрэлсүх	KHURELSUKH. D	13th Khoroo, Khan Uul District	Farmer	Наран
25	Ц.Сайнзаяа	SAINZAYA. TS	13th Khoroo, Khan Uul District	Female headed family representative	Ц.Сайн
26	А.Пүрэв	PUREV. A	13th Khoroo, Khan Uul District	Elder	А.Пүрэв
27	Ц.Цэесүрэн	TSEESUREN. TS	13th Khoroo, Khan Uul District	Elder	Ц.Цэесүрэн
28	Ч.Бурамханд	BURAMKHAND. CH	13th Khoroo, Khan Uul District	Herder	Ч.Бурамханд
29	Х.Дэлгэрмаа	DELGERMAA. KH	13th Khoroo, Khan Uul District	Female headed family representative	
30	Ц.Даваажав	DAVAAJAV. TS	13th Khoroo, Khan Uul District	Farmer	
31	Ж.Үүрийнжин	UURIINJIN. J	13th Khoroo, Khan Uul District	Women representative	Ж.Үүрийнжин
32	Д.Гүндэгмаа	GUNDEGMAA. D	13th Khoroo, Khan Uul District	Elder	
33	М.Мөнхдалай	MUNKHDALAI. M	13th Khoroo, Khan Uul District	Herder	М.Мөнхдалай
34	Б.Суманхүү	SUMANKHUU. B	13th Khoroo, Khan Uul District	Female headed family representative	Б.Суманхүү
35	Х.Алтанцацралт	ALTANTSATSRAIT. KH	13th Khoroo, Khan Uul District	Farmer	Х.Алтанцацралт
36	Н.Оюунбэлэг	OYUNBELEG. N	13th Khoroo, Khan Uul District	Farmer	Н.Оюунбэлэг
37	Д.Пүрэвсүрэн	PUREVSUREN. D	13th Khoroo, Khan Uul District	Women representative	Д.Пүрэвсүрэн
38	Б.Болд	BOLD. B	13th Khoroo, Khan Uul District	Elder	Б.Болд
39	Б.Оюун	OYUN. B	13th Khoroo, Khan Uul District	Female headed family representative	Б.Оюун
40	Э.Үржинханд	URJINKHAND. E	13th Khoroo, Khan Uul District	Female headed family representative	Э.Үржинханд
41	Ц.Батцоож	BATTSOOJ. TS	13th Khoroo, Khan Uul District	Farmer	
42	Д.Энхжаргал	ENKHJARGAL. D	13th Khoroo, Khan Uul District	Farmer	
43	О.Одонтуул	ODONTUUL. O	13th Khoroo, Khan Uul District	Women representative	О.Одонтуул



44	Б.Сэр-Од	SER-OD. B	13th Khoroo, Khan Uul District	Youth representative	
45	Х.Анхтуяа	ANKHTUYA. KH	13th Khoroo, Khan Uul District	Youth representative	
46	Э.Болорцэцэг	BOLORTSETSEG. E	13th Khoroo, Khan Uul District	Youth representative	
47	Б.Буяндэлгэр	BUYANDELGER. B	13th Khoroo, Khan Uul District	Youth representative	
48	Ж.Мөнхбат	MUNKHBAT. J	13th Khoroo, Khan Uul District	Youth representative	
49	Н.Отгонсүрэн	OTGONSUREN. N	13th Khoroo, Khan Uul District	Businessman, Ugtuul-Altai LLC	
50	С.Мөнхчимэг	MUNKHCHIMEG. S	13th Khoroo, Khan Uul District	Businessman, Baylag jims LLC	
51	Т.Бутиндахам		13th Khoroo, Khan Uul District	Businessman, Shar doctor LLC	
52	Н.Уранхайг		13th Khoroo, Khan Uul District	Businessman, Eco sport complex	
53			13th Khoroo, Khan Uul District	Businessman, Bayasakh foods LLC	
54	Ч.Номин-Доржиев		13th Khoroo, Khan Uul District	Businessman, Tumen shuvuut LLC	
55	Т.Урантөгс		ХҮА, 13 хороо Fiction 367005		
56	Монхбат.		13th Khoroo, Khan Uul district	farmer	
57	О.Оюун		13th Khoroo, Khan Uul District	Female headed family representative	
58	Н. Энхсайхан		13th Khoroo, Khan Uul district		
59					
60					
61					

Public consultation and Stakeholder  
Engagement Meeting  
Khan-Uul District  
10<sup>th</sup> Khoroo

2020.05

### Participants list

№	Name		Organization	Position	Signature
	Mongolian	English			
Local Government Representatives					
1.	Шагдарсүрэн Адъяасүрэн	ADIYASUREN Shagdarsuren	Khan Uul district 10 <sup>th</sup> khoroo Governors office	Citizen's representative council	Adyasuren
2.	Цэдэниш Чинзоригт	CHINZORIGT Tsedenish	Khan Uul district 10 <sup>th</sup> khoroo Governors office	Governor	Chinzorigt
3.	Чулуунбат Баярмаа	BAYARMAA Chuluunbat	Khan Uul district 10 <sup>th</sup> khoroo Governors office	Organizer	Y. Bayarmaa
4.	Буудал Ганжуурмядаг	GANJUURMYADAG Buudal	Khan Uul district 10 <sup>th</sup> khoroo Governors office	Social worker	B. Ganjuurmyadag ganjuur0521@gmail.com
5.	Санжмятав Дарьдулам	DARIDULAM Sanjmyatav	Khan Uul district 10 <sup>th</sup> khoroo, Labor and Welfare Service Department	Welfare specialist	C. Daridulam
6.	Чойжил Батцэцэг	BATTSETSEG Chojil	Khan Uul district State Registration Department	State registration officer	B. Battsetseg
7.	Довчин Нарантуяа	NARANTUYA Dovchin	10 <sup>th</sup> khoroo, Khan Uul district	Kheseg leader	D. Dovchin
8.	Намсрайжав Тунгалаг	TUNGALAG Namsrajav	10 <sup>th</sup> khoroo, Khan Uul district	Kheseg leader	T. Namsrajav
9.	Эрдэнээ Цасчихэр	TSASCHIER Erdenee	10 <sup>th</sup> khoroo, Khan Uul district	Kheseg leader	C. Tasshiyer
10.	Цэрэннамжил Нямцэсэн	NYAMTSESEN Tserennamjil	10 <sup>th</sup> khoroo, Khan Uul district	Kheseg leader	N. Tserennamjil
11.	Энхбаатар	ENKHBAATAR	10 <sup>th</sup> khoroo, Khan Uul district	Environment officer	E. Enkhbaatar
Local Community Representatives					
12.	Сүхбаатар Билгүүн	BILGUUN Sukhbaatar	Tsorsbuyant LLC, 10 <sup>th</sup> khoroo, Khan Uul district	Businessman	
13.	Миелхаажав Ууганбаяр	UUGANBAYAR Miyelkhajav	10 <sup>th</sup> khoroo, Khan Uul district	Businessman	U. Uuganbayar
14.	Санж Давааням	DAVAANYAM Sanj	Nisekh, 10 <sup>th</sup> khoroo Khan Uul district	Businessman	S. Davaanjam
15.	Жамъян Галмандах	GALMANDAKH Jamiyan	Well mart, 10 <sup>th</sup> khoroo, Khan uul district	Businessman	J. Galmankh
16.	Б.Батсүх	BATSUKH. B	Ilchleg cafeteria, bus station, 10 <sup>th</sup> khoroo Khan Uul district	Businessman	B. Batsukh
17.	Сангишийрэв Бямбасүрэн	BYAMBASUREN Sangishiirev	Morin, 10 <sup>th</sup> khoroo Khan Uul district	Youth representative	B. Bamsuren
18.	Сонинбал Сүхсоо	SUKHSOO Soninbal	Morin, 10 <sup>th</sup> khoroo Khan Uul district	Youth representative	
19.	Галдансүрэн Баасансүрэн	BAASANSUREN Galdansuren	10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	G. Galdansuren



№	Name		Organization	Position	Signature
	Mongolian	English			
20.	Мадий Эрдэнэбулган	ERDENEBUGAN Madii	10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	
21.	Мягмар Батцэцэг	BATTSETSEG Myagmar	10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	
22.	Мягмар Гансэлэнгэ	GANSELENGE Myagmar	10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	
23.	Бадамгарав Нямсүрэн	NYAMSUREN Badamgarav	Nisekh, 10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	
24.	Батжаргал Жаргалмаа	JARGALMAA Batjargal	Nisekh 10-150, 10 <sup>th</sup> khoroo, Khan Uul	Youth representative	
25.	Соёлсүрэн Сарантуяа	SARANTUYA Soyolsuren	Nisekh 10-194, 10 <sup>th</sup> khoroo, Khan Uul district	Youth representative	
26.	Дэмбэрэл Оюумаа	OYUMAA Demberel	10 <sup>th</sup> khoroo, Khan Uul district	Elder	
27.	Дорж Хөхөө	KHUKHUU Dorj	Morin, 10 <sup>th</sup> khoroo, Khan Uul district	Elder	
28.	Дорж Аварзэд	AVARZED Dorj	10 <sup>th</sup> khoroo, Khan Uul district	Elder	
29.	Чулуун Цэцэгмаа	TSETSEGMAA Chuluun	Nisekh, 10 <sup>th</sup> khoroo, Khan Uul district	Elder	
30.	Дашдорж Ганбаатар	GANBAATAR Dashdorj	10 <sup>th</sup> khoroo, Khan Uul district	Elder	
31.	Дашбаасан Батсайхан	BATSAIKHAN Dashbaasan	Morin, 10 <sup>th</sup> khoroo, Khan Uul district	Elder	
32.	Дугар Чинбат	CHINBAT Dugar	Morin, 10 <sup>th</sup> khoroo, Khan Uul district	Elder	
33.	Дамдинжав Баттулга	BATTULGA Damdinjav	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
34.	Лхамосор Цэнджав	TSENDJAV Lkhamsuren	Morin, 10 <sup>th</sup> khoroo, Khan Uul district	Female headed family representative	
35.	Самбуу Мөнхтуяа	MUNKHTUYA Sambuu	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
36.	Сангидулам Хүүхнээ	KHUUKHNEE Sangidulam	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
37.	Донид Алтанцэцэг	ALTANTSETSEG Donid	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
38.	Мягмаржав Циенцогзол	TSIYENTSOGZOL Myagmarjav	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
39.	Ням -Одсүрэн Наранчимэг	NARANCHIMEG Nyam- Odsuren	10 <sup>th</sup> khoroo Khan Uul district	Women representative	
40.	Ганбаатар Энхтунгалаг	ENKHTUNGALAG Ganbaatar	10 <sup>th</sup> khoroo Khan Uul district	Female headed representative	
41.	Сэтэв Энхтөр	ENKHTUR Setev	10 <sup>th</sup> khoroo, Khan Uul district	Female headed representative	
42.	Наранчимэг Наранчимэг	Naranchimeg Norjmaa	10 <sup>th</sup> khoroo, Khan Uul district	Women representative	
43.	Г. Оюун Лувсандаш	G. OYUN Luvсандаш	10-р хороо M-11-491-A	Урван, Урван	
44.	Чулуунтsetseg Лувсандаш	Chuluuntsetseg Luvсандаш	10-р хороо	Урван	
45.	Мамсран Мамсран	Mamsran Mamsran	10-р хороо	Урван	

**Public consultation and Stakeholder  
Engagement Meeting  
Ministry of Environment and Tourism**

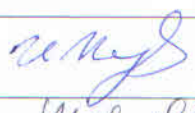
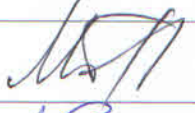



2020.05.25

Name			Organization	Position		Signature
No	Mongolian	English		Mongolian	English	
Local Government Representatives						
1	Т.Булган <i>C. Erdenebayar</i>	<i>C. Erdenebayar</i>	Ministry of Environment and Tourism	Ногоон хөгжлийн бодлого, төлөвлөлтийн газрын дарга	<i>Senior Officer Department of Green development &amp; Policy planning</i>	<i>[Signature]</i>
2	П.Цогтсайхан	<i>P. Bogtsaikhan</i>	Ministry of Environment and Tourism	Хүрээлэн буй орчин, байгалийн нөөцийн удирдлагын газрын дарга	<i>Director of Environmental Natural Resources Management</i>	<i>[Signature]</i>
3	А.Энхбат		Ministry of Environment and Tourism	Байгаль орчны үнэлгээ, аудитын хэлтсийн дарга		<i>[Signature]</i>
4	Д.Шижир-Эрдэнэ		Ministry of Environment and Tourism	Байгаль орчны үнэлгээ, аудитын хэлтсийн ахлах мэргэжилтэн	<i>Senior Officer Division of Environmental Assessment and EA.</i>	<i>[Signature]</i>
5	Д.Тэмүүлэн		Ministry of Environment and Tourism	Байгаль орчны үнэлгээ, аудитын хэлтсийн ахлах мэргэжилтэн	<i>- / k</i>	<i>[Signature]</i>
6	М.Тулга		Ministry of Environment and Tourism	Хүрээлэн буй орчин, байгалийн нөөцийн удирдлагын газрын мэргэжилтэн		
7	П.Шинэцэцэг		Ministry of Environment and Tourism	Хүрээлэн буй орчин, байгалийн нөөцийн удирдлагын газрын мэргэжилтэн		


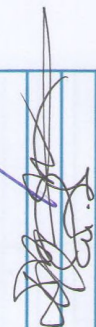
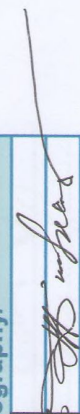
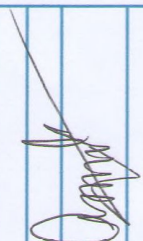


**Public consultation and Stakeholder  
Engagement Meeting  
Tuul River Basin Authority**

2020.05.13

№	Name		Position	Signature
	Mongolian	English		
1	И. Наранчимэг	NARANCHIMEG. I	Officer in charge of public awareness and training	
2	Д. Түвшинжаргал	TUVSHINJARGAL. D	Senior specialist of water integrated management and planning	
3	Х. Цогзолмаа	TSOGZOLMAA. KH	Specialist of surface water resource research	
4	М. Мягмарбат	MYAGMARBAT. M	Specialist of water construction	
5	Ю. Сувдчимэг	SUVDCHIMEG. YU	Head of Water resource and water use management division	
6	Х. Хашбаатар	KHASHBAATAR. KH	Senior officer of water consumption for mining and energy sector	
7	Ж. Отгонбаяр	OTGONBAYAR. J	Officer of urban water supply management	
8	Б. Оюунболд	OYUNBOLD. B	Head of Information and monitoring division	
9	П. Магсаржав	MAGSARJAV. P	Senior officer of water quality and ecology	
10	Б. Бат-Эрдэнэ	BAT-ERDENE. B	Specialist of monitoring and inspection	
11	А. Чанцал	CHANTSAL. A	Specialist of GIS and water data management	
12	О. Марал	MARAL. O	Specialist of information technology and cooperation	

Оролцогч талуудын танилцуулах уулзалтад оролцогчдын нэрсийн жагсаалт

№	Байгууллага, нэгжийн нэр, албан тушаал /Organization, position/	Нэр /Name/	Утасны дугаар /Phone number/	Гарын үсэг /Signature/
<b>Монголын Мянганы Сорилтын Сан /Millenium Challenge Account Mongolia/</b>				
1	Монголын МСС-ийн Баруун шинэ эх үүсвэрийн захирал	Б.Батсүх /Batsukh B/		
2	Монголын МСС-ийн Жендер нийгмийн асуудал хариуцсан захирал	З.Золзаа /Zolzaa Z/		
3	Монголын МСС-ийн БО-ны мэргэжилтэн	Д.Хулан /Khulan D/		
4	Монголын МСС-ийн НШ-ийн мэргэжилтэн	П.Энхмандах /Enkhmandakh P/		
<b>Барилга, Хот Байгуулалтын Яам /Ministry of Construction and Urban Development/</b>				
5	Хот байгуулалт, газрын харилцааны бодлогын хэрэгжилтийг зохицуулах газрын дарга	Б.Гүнболд /Gunbold B/		
6	Нийтийн аж ахуйн бодлогын хэрэгжилтийг зохицуулах газрын дарга	О.Лхагвацэдэн /Lkhagvatseden O/		
<b>Газар Зохион Байгуулалт, Геодези, Зураг Зүйн Газар /Administration of land affairs, geodesy and cartography/</b>				
7	ГЗБГЗЗГ-ын дарга	Ц.Ганхүү /Gankhuu Ts/		
8	ГЗБ-ын хэлтсийн дарга	Ж.Батсайхан /Batsaikhan J/		
9	Суурь судалгаа мониторингийн хэлтсийн дарга	П.Нямдаваа /Nyamdavaa P/		
<b>Нийслэлийн Засаг даргын Тамгын газар /Governor of the Capital City/</b>				
10	Захирагчийн ажлын албаны дарга, Улаанбаатар хотын ерөнхий менежер, хотын ажлын хэсгийн ахлагч	Т.Гантөмөр /Gantumur T/		
11	Нийслэлийн Засаг даргын хөгжлийн бодлогын асуудал хариуцсан нэгдүгээр орлогч дарга	Ж.Батбаясгалан /Batbayasgalan J/		
12	Хот байгуулалтын асуудал хариуцсан төслүүдийн удирдагч	О.Мөнгөншагай /Mungunshagai O/		
13	Хот байгуулалт, хөгжлийн газрын дарга	Б.Ууганбаяр /Uuganbayar B/		
14	Инженерийн байгууламжийн хэлтсийн дарга	Т.Хэрлэн /Kherlen T/		
15	Хотын стандарт, орчны аюулгүй байдлын хяналт, зохицуулалтын газрын орлогч дарга	О.Оджаргал /Odjargal O/		
16	УСУГ-ын дарга	Ц.Төрхүү /Turkhuu Ts/		



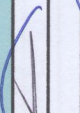

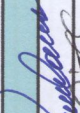




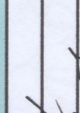
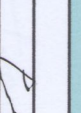
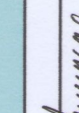
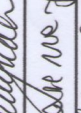





Нийслэлийн Газар Зохион Байгуулалтын алба /Land and Administration Department of the Capital City/				
17	НГЗБА-ны дарга	А.Энхманлай /Enkhnalai A/		
18	Газар ашиглалт, бүртгэлийн хэлтсийн дарга	Д.Бат-Өлзий /Bat-Ulzii D/		
19	Газар чөлөөлөх хэлтсийн дарга	Д.Энхтөр /Enkhtur D/		
20	Газар чөлөөлөх хэлтсийн ахлах мэргэжилтэн	Б.Мягмарсүрэн /Myagmarsuren B/		
21	Газар чөлөөлөх хэлтсийн ХУД хариуцсан ГЗБ	Ш.Амартайван /Amartaivan Sh/		
22	Газар ашиглалт, бүртгэлийн хэлтсийн ХУД хариуцсан ГЗБ	Б.Төмөрбаатар /Tumurbaatar B/		
23	Газар ашиглалт, бүртгэлийн хэлтсийн ХУД хариуцсан ГЗБ	Л.Нямдаваа /Nyamdavaa L/		
Хан-уул Дүүргийн Засаг даргын Тамгын газар /Governor of Khan-Uul District/				
24	ХУД-ийн Засаг дарга	Ж.Алдаржавхлан /Aldarjavkhan J/		
25	ХУД-ийн Засаг даргын орлогч	А.Амартүвшин /Amartuvshin A/		
26	ХУД-ийн төрийн захиргаа, удирдлагын хэлтсийн дарга	Н.Буянхичиг /Buyankhishig N/		
27	ХУД-ийн ТЗУХ-ийн хороо хариуцсан мэргэжилтэн	Н.Алимаа /Alimaa N/		
28	ХУД-ийн ГЗБА-ны дарга	Ч.Мөнхбаатар /Munkhbaatar Ch/		
29	ХУД-ийн ГЗБА-ны ахлах мэргэжилтэн	М.Сэргэлэн /Sergelen M/		
30	ХУД-ийн 10-р хороо хариуцсан ГЗБ	Л.Мөнх-Эрдэнэ /Munkh-Erdene L/		
31	ХУД-ийн 13-р хороо хариуцсан ГЗБ	Т.Эрдэнэбаяр /Erdenebayar T/		
32	ХУД-ийн 12-р хороо хариуцсан ГЗБ	Б.Гончигдорж /Gonchigdorj B/		
33	ХУД-ийн 12, 13-р хороо хариуцсан ГЗБ	З.Батцэнгэл /Battsengel Z/		
34	ХУД-ийн 10-р хорооны ЗД	Ц.Чинзоригт /Chinzorigt Ts/		
35	ХУД-ийн 13-р хорооны ЗД	А.Одбаяр /Odbayar A/		
36	ХУД-ийн 12-р хорооны ЗД	Д.Долгор /Dolgor D/		
37	ХУД-ийн 10-р хорооны нийгмийн ажилтан	Б.Ганжуурмядаг /Ganjuurmyadag B/		
38	ХУД-ийн 13-р хорооны нийгмийн ажилтан	М.Бадамханд /Badamkhand M/		
39	ХУД-ийн 12-р хорооны нийгмийн ажилтан	Т.Энхцацрал /Enkhtsatsral T/		



31	ХУД-ийн ГЗБА-ны ахлах мэргэжилтэн	М.Сэргэлэн	
32	ХУД-ийн 10-р хороо хариуцсан ГЗБ-гч	Л.Мөнх-Эрдэнэ	
33	ХУД-ийн 13-р хороо хариуцсан ГЗБ-гч	Т.Эрдэнэбаяр	
34	ХУД-ийн 12-р хороо хариуцсан ГЗБ-гч	Б.Гончигдорж	
35	ХУД-ийн 12, 13-р хороо хариуцсан	З.Батцэнгэл	
36	ХУД-ийн 10-р хорооны ЗД		
37	ХУД-ийн 13-р хорооны ЗД		
38	ХУД-ийн 12-р хорооны ЗД		
39	ХУД-ийн 10-р хорооны нийгмийн ажилтан		
41	ХУД-ийн 13-р хорооны нийгмийн ажилтан	Ш.Бадамсэлэн	
42	АЕСОМ компанийн Төслийн гэгд менежер	Joseph Tomasi	
43	Прессинг Инженеринг ХХК-ийн төслийн менежер	Х.Сэрэншаран	
44	—и— Гүйцэтгэх захирал	Ш.Ганзориг	
45	—и— Тарааг хариуцаа, нийслэл хариуцсан захирал	О.Оюунбаяр	
46	—и— Төслийн ажилтан	Н.Очир	
47	—и— Зурал төслийн инженер	Р.Бат-Ерөөл	
48	мэдр хрх Төслийн менежер	А.Баянзаса	
49	мэдр хрх Газар зохион байгуулалт	А.Шамсир	
50	мэдр хрх Б.Ганзориг дэвхэр	Б.Ганзориг	
51	мэдр хрх. Төслийн менежер Л.Бадамсэлэн	Л.Бадамсэлэн	
52	мэдр хрх Гүйцэтгэх захирал Д.Булганбаяр	Д.Булганбаяр	
53	МСА-М	А.Болор	
54	МСА-М	Г.Сүхбаатар	
55	МСА-М	С.Амгалан	
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“УС ХАНГАМЖИЙН БАРУУН ШИНЭ ЭХ ҮҮСВЭРИЙН АЖЛЫН ЗУРАГ ТӨСӨЛ /БОННУ/НШТ БОЛОВСРУУЛАХ ЗӨВЛӨХ ҮЙЛЧИЛГЭЭ” ТӨСӨЛ  
ХУД-ийн мэргэжилтнүүд, хороодын зохион байгуулагчид, нийгмийн ажилтнуудтай хийх ярилцлага, уулзалт

№	Байгууллага, нэгжийн нэр, албан тушаал /Organization, position/	Нэр /Name/	Гарын үсэг /Signature/	Утасны дугаар /Phone number/
<b>Монголын Мянганы Сорилтын Корпораци /Millenium Challenge Account Mongolia/</b>				
1	Монголын МСС-ийн БО-ны мэргэжилтэн	Д.Хулан /Khulan D/		
2	Монголын МСС-ийн НШ-ийн мэргэжилтэн	П.Энхмандах /Enkhmandakh P/		
<b>Хан-уул Дүүргийн Засаг даргын Тамгын газар /Governor of Khan-Uul District/</b>				
3	ХУД-ийн ЗД-ын I орлогч	Г.Батсайхан /Batsaikhan G/		
4	ХУД-ийн Хот тохижилтын хэлтэсийн БО, агаарын бохирдол хариуцсан мэргэжилтэн	Ч.Ишдулам /Ishdulam Ch/		
5	Дэд бүтцийн хөгжил, төлөвлөлт хариуцсан мэргэжилтэн	О.Мөнгөншагай /Mungunshagai O/		
6	Хөдөлмөр, нийгмийн хамгааллын асуудал хариуцсан мэргэжилтэн	Б.Саранцацрал /Sarantsatsral B/		
7	ХУД-ийн тохижилт нийтийн аж ахуйн газрын дарга	Ц.Бат-Эрдэнэ /Bat-Erdene Ts/		
8	Нийгмийн халамжийн хэлтсийн дарга	Н.Мэндбаяр /Mendbayar N/		
9	Нийтийн аж ахуйн асуудал хариуцсан мэргэжилтэн	Э.Баатарсүрэн /Baatarsuren E/		
<b>Хан-уул Дүүргийн Газар зохион байгуулалтын алба /Land and Administration Department of the Khan-Uul district/</b>				
10	ХУД-ийн ГЗБА-ны ахлах мэргэжилтэн	М.Сэргэлэн /Sergelen M/		
11	ХУД-ийн 13-р хороо хариуцсан ГЗБ-гч	Т.Эрдэнэбаяр /Erdenebayar T/		
12	ХУД-ийн 12-р хороо хариуцсан ГЗБ-гч	Б.Гончигдорж /Gonchigdorj B/		
13	ХУД-ийн 10-р хороо хариуцсан ГЗБ-гч	Л.Мөнх-Эрдэнэ /Munkh-Erdene L/		
<b>Хан-уул Дүүргийн Газар зохион байгуулалтын алба</b>				
14	ХУД-ийн 13-р хорооны нийгмийн ажилтан	М.Бадамханд /Badamkhand M/		
15	ХУД-ийн 13-р хорооны зохион байгуулагч	Д.Ариунтунгалаг /Ariuntungalag D/		
16	ХУД-ийн 10-р хорооны нийгмийн ажилтан	Б.Ганжуурмядаг /Ganjuurmyadag B/		
17	ХУД-ийн 10-р хорооны зохион байгуулагч	Ч.Баярмаа /Bayarmaa Ch/		
18	ХУД-ийн 12-р хорооны нийгмийн ажилтан	Т.Энхцацрал /Enkhsatsral T/		
19	ХУД-ийн 12-р хорооны зохион байгуулагч	М.Эрдэнэбат /Erdenebat M/		

АНД 958 аймхи гарса

Ч.Мөнхбаатар



Төслийн ажилтнууд /Project staffs/			
20	Престиж инженеринг ХХК-ийн гүйцэтгэх захирал	Ш.Ганзориг /Ganzorig Sh/	
21	Престиж инженеринг ХХК-ийн гадаад харилцаа, төсөл хариуцсан захирал	О.Оюумаа /Oyumaа O/	
22	Престиж инженеринг ХХК-ийн төслийн менежер	Д.Сармандал /Sarmandal D/	
23	AECOM төслийн дэд менежер	Joseph Tomasi	
24	AECOM	Gabriel	
25	Престиж инженеринг ХХК-ийн төслийн ажилтан	Очгарьд /Ochgarid/	
26	Би Жи Эм Дистрибьюшн ХХК-ийн захирал	И.Бямбаахүү /Byambakhuu I/	И.Бямбаахүү
27	ЖЭМР ХХК-ийн төслийн менежер	Л.Бадамхорлоо /Badamkhorloo L/	Бадамхорлоо
28	ЖЭМР ХХК-ийн гүйцэтгэх захирал	Д.Булганбаяр /Bulganbayar D/	
29	ЖЭМР ХХК-ийн газар зохион байгуулагч	Б.Гантулга /Gantulga B/	Б.Гантулга
30	ЖЭМР ХХК-ийн мэргэжилтэн	М.Дамдинпүрэвням /Damdinpurevnyam M/	М.Дамдинпүрэвням
31	ЖЭМР ХХК-ийн мэргэжилтэн	А.Батзаяа /Batzaya A/	А.Батзаяа
32	ЖЭМР ХХК-ийн мэргэжилтэн	А.Тамираа /Tamiraa A/	А.Тамираа
33	Түүд 10-р хорооны Заасаа Вара	Ц.Цэцэгзоригийн	Ц.Цэцэгзоригийн
34	13-р хороо Төсөл дорнод	А.Оюунзориг	А.Оюунзориг
35	13-р хороо Заасаа Вара	С.Дорногой	С.Дорногой
36	Монголын МСС Тогтвортой даяурын	Монгол Улсын Т.Цэцэгзоригийн	Монгол Улсын Т.Цэцэгзоригийн
37	Монголын МСС Тогтвортой даяурын	Монгол Улсын Т.Цэцэгзоригийн	Монгол Улсын Т.Цэцэгзоригийн
38	Монголын МСС-ийн НҮЛЭГЭН ШИШЭЭНИЙН МЭРГЭЖИЛТЭН	П.ЭНХМАНДАХ	П.ЭНХМАНДАХ

39. Түүд-аан 13 дугаар хороо, Түүд  
монголын Заасаа Вара дорнод  
адаахис

М.Омгонбаяр

**Public consultation and Stakeholder**

**Engagement meeting**

**Tuul river basin authority**

2020.09.24



	Name		Position	Signature
	Mongolian	English		
1	Б. Оюунболор		Замуурааны дарга	
2	Ц. Агваагч	Adyasuren. Ts	Мэргэжлийн	Ц. Агваагч
3	Б. Бат-Эрдэнэ	B. Bat-Erdene	Мэргэжлийн	
4	М. Нямсүх	M. Niamsukh	Мэргэжлийн	
5	М. Мухамедов	M. Muxamedov	Мэргэжлийн	
6	Х. Хашбаатар	Kh. Khasbaatar	ОХ. мэрг.	
7	Д. Франц	D. Franchimov	Мэргэжлийн	
8	Р. Энхбаяр	P. Enkhbayar	Мэргэжлийн	
9	Б. Номин-Эрдэнэ	Nomin-erdene. B	Мэргэжлийн	
10	О. Марал	Maral. O	Мэргэжлийн	
11	П. Мугсаржав	Magsarjav. P	ахлах мэргэжлийн	
12	Х. Түвшинбаяр	Tuvshinbayar	Мэргэжлийн	
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**Public consultation and Stakeholder  
Engagement meeting  
Ministry of Environment and Tourism**

2020.10.02

	Name		Position	Signature
	Mongolian	English		
1	Д. Мухор-орлогч	БОАТГ-ЫН БОХАА-ЫН АХААХ МЭРГЭЖЛИЙН		
2	А. Билэвч	Хөтөлбөр гэрээ		
3	Н. Ганзориг	Хөтөлбөр гэрээ		
4	О. Билэвч	УБОВИГ гэрээ		
5	С. Ганзориг	БОАТГ-ЫН БОХАА-ЫН		
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## **B.4 SEP from Contract Work Plan**

## Contract Work Plan - Appendix G:

### Public Consultation and Stakeholder Engagement Plan

#### Objectives

The ESIA Methodology includes a draft Public Consultation and Stakeholder Engagement Plan, presented below, for both the ESIA and the Resettlement Action Plan (RAP). The plan details the proposed strategy for providing opportunities to affected organizations and communities to express their views on the potential risks, opportunities, and impacts generated by the project and proposed mitigation. The plan focuses on inclusive engagement to maximize participation of women, men, and members of vulnerable groups, with the following overarching objectives:

- Providing sufficient and accessible information to enable stakeholders, including local communities, to become at a minimum informed and educated about the proposed project and its potential impacts, and to build their capacity to participate.
- Identifying and discussing issues of concern and suggestions for enhanced benefits.
- Facilitating commenting on alternatives.
- Contributing local knowledge and experience to impact assessment.
- Creating a mechanism of project accountability to stakeholders.
- Achieving regulatory and statutory compliance.

An effective ESIA process requires engagement with relevant stakeholders throughout the key stages. This assists in understanding stakeholder views on the project and in identifying issues that should be considered in the prediction and evaluation of impacts. At this stage, in accordance with the ESIA scoping and impact assessment activities, a public consultation and stakeholder engagement plan has been developed. The principal scoping and impact assessment public consultation and stakeholder engagement activities will occur in June and September 2019.

#### Project Areas

- 32th khoroo of Songino Kharihan district
- 12th and 13th khoroo of Khan-Uul district
- Altanbulag soum, Tuv Aimag province

#### Regulation

- Public consultation and information disclosure guidelines of the International Finance Corporation (IFC).
- Mongolian Law on Environmental Impact Assessment (2012) and order A-03 dated 6 January 2014 by the Minister of Environment and Green Development on "Ensuring public participation in environmental impact assessment".

IFC Performance Standard 1 (January 1, 2012) requires that project-affected groups and local non-governmental organizations (NGOs) be consulted during the impact assessments process about the project's potential environmental and social impacts.

The main purpose of this consultation is to take local views into account in designing the environmental and social management plans (ESMPs) as well as in project design. There are other IFC Performance Standards on Environmental and Social Sustainability, notably:



- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 7: Indigenous Peoples

These include provisions for public consultation. These requirements focus on early consultation with affected people and NGOs, early disclosure of information, and providing information in a way that allows informed consultation with stakeholders and project-affected people.

The IFC manual *Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual* provides action-oriented guidelines aimed at ensuring that consultation is both effective and meaningful. The guidelines emphasize the need for the project sponsor to make sure that the process of public consultation is accessible to all potentially affected parties, from the national to the local level. Emphasis is placed on the engagement of local stakeholders, namely people who are likely to experience the day-to-day impacts of a proposed project. On a practical level, effective stakeholder engagement requires that:

- All stakeholders have access to project information.
- The information provided can be understood.
- The locations for consultation are accessible to all who want to attend.
- Measures are put in place that make sure that vulnerable or minority groups are consulted.

The consultation requirements for projects requiring physical or economic displacement are covered by IFC Performance Standard 5: Land Acquisition and Involuntary Resettlement and outlined in the IFC Handbook for Preparing a Resettlement Action Plan.

The objective of these consultations is the participation of affected parties in the planning and implementation of their own resettlement. In particular, the following areas require consultation:

- Alternative project design.
- Assessment of project impacts.
- Resettlement strategy.
- Compensation rates and eligibility for entitlements.
- Choice of resettlement site and timing of relocation.

International requirements are summarized in Table 1.

**Table 1. International Requirements on Public Consultation**

<b>World Bank and IFC requirements</b>	
<b>Policy Requiring Public Consultation</b>	<ul style="list-style-type: none"> <li>Performance Standard 5: Land Acquisition and Involuntary Resettlement.</li> <li>Performance Standard 7: Indigenous Peoples.</li> </ul>
<b>Requirements Who should be consulted?</b>	Directly and indirectly affected stakeholders, and those with an interest who feel they may be affected.
<b>Why involve the public?</b>	Minimizes conflict and delays; increases transparency; empowers people ensuring that their views are taken into account during project design and development of ESMPs.
<b>When should stakeholders be involved?</b>	At a minimum, during scoping and screening stages and on the draft ESIA. For complex projects where the environmental impacts and risks are substantial, consultation during project execution is also required.
<b>What areas require consultation?</b>	Alternative project design; assessment of project impacts; resettlement strategies; compensation rates and eligibility for entitlement; choice of resettlement sites and timing of relocation; development opportunities and initiatives; grievance redress procedures and dispute resolution; methods and mechanisms for monitoring, evaluation and implementing corrective actions.
<b>Responsibilities for Public Consultation</b>	<p>Responsibilities should be allocated clearly and early on and should make sure that:</p> <ul style="list-style-type: none"> <li>All stakeholders have access to project information</li> <li>The information provided can be understood</li> <li>The locations for consultation are accessible to all who want to attend</li> <li>Vulnerable or minority groups are consulted.</li> </ul>
<b>Requirements of these IFC Performance Standards</b>	Early consultation with affected people and NGOs; early disclosure of information; providing accessible information.
<b>Comments</b>	<p>Specific requirements for disclosure of documents relating to the ESIA on projects seeking international funding include:</p> <ul style="list-style-type: none"> <li>Preparation and publication of a Public Consultation and Disclosure Plan (PCDP) for consultation</li> <li>Disclosure of draft ESIA including a nontechnical summary in public places</li> <li>Preparation of an ESMP to avoid, mitigate and monitor the impacts identified in the ESIA</li> </ul>

## Methodology

The media described below will be used to communicate information to each of the stakeholder groups identified:

- Mass media, (newspapers, posters, radio, television).
- Brochures, leaflets, posters, and reports.
- Meetings and workshops.
- Posters and other visual displays.

The methods that will be used to consult with each of the stakeholder groups may vary according to target audience. For example:

- Interviews with key people and groups.
- Surveys, polls and questionnaires.
- Public meetings.
- Public hearings.
- Continuous participation processes involving agents or committees in the project zone.
- Other traditional mechanisms for consultation and decision-making.

### Public Meetings

- Offer customized presentations to focus groups and organizations.
- Co-host workshops with community groups, business associations, etc.

### Techniques for Public Meetings

- Question-and-Answer.
- Customized presentations.
- Vary time of day for workshops (day/evening).
- Advertising.
- Briefings / presentations.
- Print and electronic media.
- Print materials / mail outs.
- Response summaries.
- Symposia / expert panels.
- Telephone hotlines.
- Web sites and other Internet tools.

### Visualization techniques

- Maps.
- Charts, illustrations, photographs.
- Table-top displays and models.
- PowerPoint slide presentations.

### Planning Consultation and Public Participation

Planning for consultation will be started within formal consultation early in the ESIA process. Such planning will involve:

- Defining clear objectives regarding which issues are to be addressed, which issues are not under discussion and what are the key decisions involved.
- Integrating consultation and participation within the ESIA and project design process, taking account of the information and internal communication requirements of the ESIA team and project designers.
- Allocating sufficient resources and scheduling work.

## Interested and Affected Parties

Those affected by development include a broad range of individuals and communities, including business communities, local residents, and local, national and traditional government representatives:

- The consultaion process needs to involve women and men, the old and young.
- Indirect and secondary impacts of development can significantly affect people not directly associated with a project.
- In the initial stages consult as widely as possible involving local organizations or community groups, NGOs, business representatives or trade associations, public representatives, local or national government representatives.
- Some people, often the most vulnerable, have difficulty voicing their concerns. This often includes groups such as those involved in the informal economy, the poor and illiterate.

## Consultation Process

The planning process should take full account of the strategic concerns outlined above, as well as the following key planning tasks:

- Identify all stakeholder groups (typically integrated with social assessment).
- Identify the key issues around which consultation will be needed (scoping).
- Understand the decision making process.
- Determine the necessary level of consultation.
- Identify key consultation points.
- Select consultation techniques.
- Define a communication method.

## Consultation Meeting and Discussion Objective

- Identify stakeholders at the project site, and map their geographic location.
- Identify the means to communicate information to all parties, obtain and exchange information.
- Provide detailed information on environmental and social impact assessment of the project to the residents and parties.
- Give comprehensive understanding on the project environmental and social impacts both positive and negative.
- Conduct consultation meetings with potentially affected local people.
- Organize public discussion.
- Obtain views of indigenous and local residents, and seek the possibility of reflecting their opinion in the project activities.
- Provide public participation in the decision making process.

Comprehensive public presentations and a subsequent consultative agreement will be an impetus to the project proceeding without any public conflict and challenges. Basic information shall include the following:

- Related legal documents
- Decision issues with respect to the project design
- Information about the possible positive and negative environmental and socio-economic impacts during the preconstruction, construction, operation and maintenance, and decommissioning phases

### Other Issues

- Identify community groups and entities in the region and project area.
- Identify socio-economic and political situation.
- Cultural heritage.
- History of the area.
- Previous discussions, agreements, and public consultation related to the implementation of the project activities.
- Current environmental situation of the project area.
- Public opinion during ESIA.

### Collaborative Parties

Parties will be considered from national and local level, such as the representatives of the government organizations, the civil society organizations, and individuals directly and indirectly affected by project implementation (see Table 2). These may include:

#### Representation of Government Organizations

- Ministry of Environment Tourism.
- Ulaanbaatar city council.
- Mineral Resources and Petroleum Authority.
- USUG.
- Tuul River Basin Authority.
- Governor's Office and Citizen's representative council of Songino Khairhan district.
- Governor's Office and Citizen's representative council of Khan-Uul district.
- Governor's Office and Citizen's representative council of Altanbulag soum.
- Environmental officers and state inspectors of districts and soum.
- Environmental and Tourism offices of districts and soum.
- Citizen's council and Governor of bags, etc.

#### Representation of the Civil Society Organizations

- NGOs operating in environmental field.
- NGOs operating in human right issues.



## Citizens of the Respective District, Soum and Bag

- Residents.
- Herders.
- Farmers.
- Small and medium-sized enterprises (SMEs).

**Table 2. Matrix of the Stakeholders**

	Public Involvement	Newspaper	Radiobroadcast	TV	Introduction of the Project	Interview	Questionnaire	Stakeholder meeting	Organizing the discussions
Public consultation and communication process	Ministry of Environment and Tourism				√	√		√	√
	Ulaanbaatar city council				√	√		√	√
	Mineral Resources and Petroleum Authority				√	√		√	√
	USUG				√	√		√	√
	Tuul River Basin Authority				√	√		√	√
	Governor's Office and Citizen's representative council of Songino Khairhan district				√	√		√	√
	Governor's Office and Citizen's representative council of Khan-Uul district				√	√		√	√
	Governor' Office and Citizen's representative council of Altanbulag soum				√	√		√	√
	Environmental officers and state inspectors of district and soum				√	√		√	√
	Environmental and Tourism offices of districts and soum				√	√		√	√
	Local NGOs working in the field of environment				√	√	√	√	√
	Local NGOs conducting human rights activities				√	√	√	√	√
	Citizens who risk being affected by project activities				√	√	√	√	√
	Citizen's council and Governor of bags				√	√	√	√	√

## Introduction to the Project

Prepare introduction to the project for local residents that includes:

- Brief presentation about the project.
- Brief intro about the current environmental status and socio-economic study of the area.
- Brief intro about ESIA.

Prepare questionnaire for all parties involved, conduct polls, and analyze and process survey results.

## Organization of Consultation Meetings and Workshop

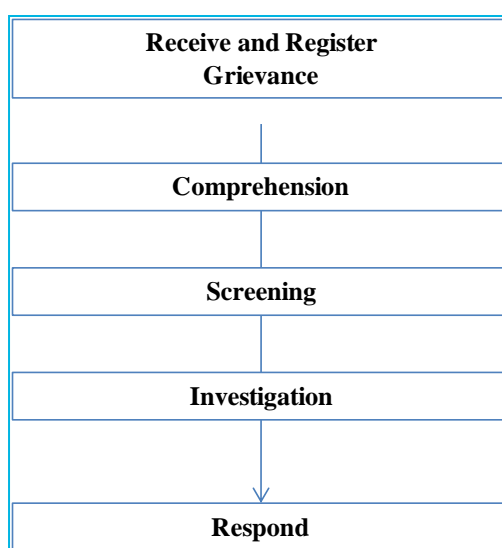
- Organize consultation meetings in each project area.
- Conduct meeting with authorities of bag, soum and aimags to provide information about the project
- Conduct meeting with the representatives of the environmental NGOs
- Organize a workshop with stakeholders from national to local level to deliver and get feedback on the ESIA results. It may include (but not be limited to):
  - Land use.
  - Rehabilitation.
  - Pastureland utilization, pasture conflict.
  - Infrastructure.
  - Impacts on environmental components (air, water, soil).
  - Social and gender impact assessments.
  - Discussion to get feedback on the project.

## Principles of Organizing Public Discussion

Use of selected public participation method involves:

- Getting to know the parties, creating the conditions for collaboration and expression of their concerns and interests.
- Offering as complete and wide scoped information on the project as possible to all interested groups, and people at each project site.
- While organizing meetings and discussions, in order to get realistic opinion from the parties, dividing them in accordance with their interest groups.
- Recognizing that each individual has right to express his/her view during discussion.
- Facilitating and helping all participants to actively participate in the discussion process.
- Acquiring as many views as possible from the public interest groups.
- Handling complaints and critiques from the public consultation process in the sequence shown in Figure 1.
- Following the public consultation process outlined in Table 3.

**Figure 1. Grievance Mechanism Process**



**Table. 3 The Public Consultation Process**

	No.	Planned Activities	Timeline	Frequency	Implementation period
COMMUNICATION	Goal: Provide general information about the project to the public				
	One. Organize public consultation				
	1.1.	Identify the stakeholders	Early in ESIA study	During the field investigation	June, 2019
	1.2.	Exchange opinion about the project with communities and government officials of Songino Khairhan and Khan-Uul districts and Altanbulag soum of Tuv aimag	Early in ESIA study	3 times	June, 2019
		Meet with Heads and relevant officials of Environment and Tourism Department of Songino Khairhan and Khan-Uul districts and Altanbulag soum of Tuv aimag	During the field investigation		
	1.4.	Meet with Tuul River Basin Administration and Council	During the field investigation		June, 2019
	1.5.	Get comments from the residents of Songino Khairhan and Khan-Uul districts and Altanbulag soum of Tuv aimag	During the investigation	3 times	June - July, 2019

	No.	Planned Activities	Timeline	Frequency	Implementation period
CONSULTATION	Two. Organize a discussion: Organize a discussion on the preliminary results of ESIA				
	<b>2.1. Discussion preparation</b>				
	2.1.1	General: Involve government officials, researchers, experts, and representatives of professional/specialized organizations; to enable free and voluntary participation in the discussion ensuring that the process and results of the public discussion are open and transparent	From the beginning of the work	1 time	July - August 2019
	2.1.2	Discussion preparation: Preparation for the discussion Make announcement of the discussion to the public Receive comments during the discussion Preplan to include comments that came out of the discussion into the project	Before each discussion	3 times	August - September 2019
	2.1.3	Make a request to the Governor about organizing the discussion and agree on the date and venue	Before each discussion	3 times	August - September 2019
	2.1.4	Choose the discussion format depending on the attendance forecast	Before each discussion	3 times	August - September 2019
	<b>2.2. First discussion:</b> Discuss scope of ESIA study and receive comments				
	2.2.1	Where: Civic Hall of Songino Kharihan and Khan-uul districts, and Altanbulag soum Participants: Communities that may be affected by the impacts of the project There will be sub-group discussions in each soum: <ul style="list-style-type: none"> <li>• Herders and farmers</li> <li>• Civil society</li> <li>• Women, youth and elderly</li> <li>• Government bodies and other stakeholders</li> <li>• Tuul River Basin Administration, and River Basin Council</li> <li>• Environment and Tourism Department of Songino Kharihan and Khan-uul districts, and Altanbulag soum</li> </ul>	After completing the draft ESIA report	1 time	June 2019

	No.	Planned Activities	Timeline	Frequency	Implementation period
	<b>2.3. Second discussion:</b> Discuss results of draft ESIA report and receive comments				
		Where: Civic Hall of Songino Kharihan and Khan-uul districts, and Altanbulag soum Participants: Communities that may be affected by the impacts of the project. There will be sub-group discussions in each soum: Herders and farmers Civil society Women, youth and elderly Government bodies and other stakeholders Tuul River Basin Administration, and River Basin Council Environment and Tourism Department of Songino Kharihan and Khan-uul districts, and Altanbulag soum	After completing the final ESIA report	1 time	September 2019

Detailed notes will be taken during every consultation with the public. These notes will cover the following issues:

- Time of the consultation (date, the duration of the consultation).
- Name of the place where consultation is held.
- Discussed issues, topics.
- Full name and position of the individual who conducted informational session during consultation.
- Full names and positions of citizens who asked questions and shared their proposals/critiques. (The main content of the proposal/critique of each citizen is included in the consultation notes.)
- Full names and positions of citizens who responded/answered to proposals/critiques. (The main content of the response/answer of each citizen is included in the consultation notes.)

Proposals from the consultation that cannot be resolved by the ESIA consulting team will be submitted to the relevant authorities. The ESIA consulting team is also responsible for getting responses to these proposals and providing responses to the citizens. The critiques received during the consultation are resolved according to the grievance resolution process.

Reports will be generated for every public consultation and submitted to the MCA. The report will have the following structure:

- Introduction
- General background/information



- Objectives
- Process of public consultation
- Main questions and proposals from the consultation
- Guidances
- Conclusion

**Table 4. Checklist of open public consultation and information transparency**

Schedule of Public Consultations	Public Consultation I June 2019	Public Consultation II September 2019
<b>Consultation Topics</b>	Discuss scope of ESIA study and receive comments	Discuss draft results of the ESIA report and receive comments
<b>Stakeholders</b>		
<b>1. Governmental Organizations</b>		
1.1 State Administrative Central Organization		
1.2 Representatives of Governmental Organizations of Districts		
1.3 Representatives of Governmental Organizations Soms		
1.4. Representatives Governmental Organizations of Bags		
<b>2. Non-Governmental Organizations</b>		
2.1. Civil		
2.2. Cultural		
2.3. Business		
2.4. Other		
<b>3. Private Sector</b>		
3.1. Health		
3.2. Education		
3.3. Business		
3.4. SMEs		
3.5. Construction		
3.6. Agriculture		
3.7. Natural resources management community cooperative		
3.8. Forestry		
<b>4. Personal information</b>		
4.1. Age		
4.2. Gender		
4.3. Income/employment		
4.4. House wife		
4.5. Status in the family/ Head of a family		
4.6. Unemployed		
4.7. Pensioners		
4.8. Address		
4.9. Other		

# Appendix C Water Quality Data

Table C-1 Surface Water General Chemistry and Heavy Metals

Constituent			Biokombinat Wellfield									Shuvuun Wellfield			
	Sample number		SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13
	Lab number		L-14107	L-14108	L-14109	L-14110	L-14111	L-14112	L-14113	L-14114	L-14115	L-14162	L-14163	L-14164	L-14165
	Date		2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.2 9	2019.8.3 0	2019.8.3 0	2019.8.3 0	2019.8.3 0
	Unit	MNS0900:2018	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Total Alkalinity as Calcium Carbonate, CaCO <sub>3</sub>	mg/l	-	145.0	40.00	50.00	45.00	55.00	50.00	45.00	35.00	50.00	60.00	60.00	145.00	60.00
Aluminum (Total), Al	mg/l	0.50	0.244	0.174	0.083	0.086	0.090	<0.025	0.183	0.192	0.127	0.271	0.276	0.064	0.334
Aluminum (Dissolved), Al	mg/l		0.055	0.027	0.033	0.028	0.028	<0.025	0.040	0.047	0.032	0.116	0.088	<0.025	0.073
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	9.52	0.14	<0.10	0.71	0.34	<0.10	0.13	0.14	1.46	2.19	2.13	3.99	1.94
Arsenic (Total), As	mg/l	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	<0.01
Arsenic (Dissolved), As	mg/l		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	<0.01
Barium (Total), Ba	mg/l	0.70	0.04	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.07	0.02
Barium (Dissolved), Ba	mg/l		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02
Bicarbonate, HCO <sub>3</sub> <sup>-</sup>	mg/l	-	177.0	48.81	61.02	54.91	67.12	61.02	54.91	42.71	61.02	73.22	73.22	177.0	73.22
Biological Oxygen Demand	mgO/l	-	16.89	13.26	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	13.26	14.46	15.69	12.06
Cadmium (Total), Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium (Dissolved), Cd	mg/l		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium (Total), Ca	mg/l	100.0	73.99	33.45	37.50	26.62	34.56	42.03	24.86	29.77	23.34	37.94	41.04	93.45	36.43
Calcium (Dissolved), Ca	mg/l		38.28	12.77	16.73	16.07	17.17	18.51	10.91	13.06	13.46	18.21	18.58	40.17	17.50
Carbonate, CO <sub>3</sub>	mg/l	-	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Chlorine, Cl <sup>-</sup>	mg/l	350.0	37.44	6.81	10.21	6.81	6.81	10.21	<3.0	6.81	10.21	17.02	13.61	34.03	13.61
Chromium (Total), Cr	mg/l	0.05	0.041	0.020	0.019	0.014	0.016	0.020	0.018	0.021	0.016	0.027	0.026	0.019	0.023
Chromium (Hexavalent), Cr	mg/l	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand	mgO/l	-	48.00	45.00	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	46.00	62.00	51.00	30.00
Copper (Total), Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (Dissolved), Cu	mg/l		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity	µS/cm	1000	401.2	96.80	125.5	135.3	121.7	144.3	96.80	95.90	106.9	168.0	166.0	400.0	170.5
Dissolved Oxygen	mg/l	-	6.10	5.10	9.50	8.10	7.80	9.10	7.90	8.10	8.10	5.50	4.50	6.10	5.80
Total Hardness	meq/l	7.00	2.43	0.78	1.02	1.00	1.09	1.14	0.69	0.80	0.86	1.13	1.15	2.50	1.08
Fluoride, F	mg/l	0.7-1.5	1.04	0.63	0.86	0.75	0.90	0.38	1.08	0.54	0.90	0.91	0.64	1.30	0.88
Iron (Total), Fe	mg/l	0.30	0.590	0.330	0.154	0.200	0.195	0.143	0.313	0.339	0.245	0.633	0.658	1.379	0.606
Iron (Dissolved), Fe	mg/l		0.158	0.065	0.938	0.065	0.044	0.036	0.083	0.093	0.078	0.282	0.222	0.536	0.194
Lead (Total), Pb	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Dissolved), Pb	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium (Total), Mg	mg/l	30.0	12.31	4.47	5.26	3.99	5.74	6.12	3.94	4.07	4.16	5.65	5.94	14.27	5.23
Magnesium (Dissolved), Mg	mg/l		6.34	1.73	2.29	2.37	2.83	2.67	1.72	1.76	2.26	2.71	2.66	6.08	2.48
Manganese (Total), Mn	mg/l	0.10	0.42	0.03	0.02	0.03	0.03	<0.01	0.03	0.03	0.04	0.47	0.50	6.76	0.27
Manganese (Dissolved), Mn	mg/l		0.22	0.01	<0.01	0.02	0.02	<0.01	0.01	0.01	0.02	0.23	0.22	2.89	0.13
Mercury (Dissolved), Hg	µg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum (Total), Mo	mg/l	0.07	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.005	0.015	<0.005
Molybdenum (Dissolved), Mo	mg/l		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Nickel (Total), Ni	mg/l	-	0.012	0.015	0.017	0.011	0.012	0.015	0.015	0.017	0.011	0.013	0.015	0.017	0.013

Constituent			Biokombinat Wellfield									Shuvuun Wellfield			
	Sample number		SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13
	Lab number		L-14107	L-14108	L-14109	L-14110	L-14111	L-14112	L-14113	L-14114	L-14115	L-14162	L-14163	L-14164	L-14165
	Date		2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.30	2019.8.30	2019.8.30	2019.8.30
	Unit	MNS0900:2018	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Nickel (Dissolved), Ni	mg/l		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	0.66	0.60	0.66	0.63	0.63	0.63	0.69	0.63	0.69	0.60	0.60	0.63	0.60
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	0.21	0.07	<0.05	0.05	<0.05	0.18	2.20	2.70	1.90	2.40
Potential of hydrogen, pH	-	6.5-8.5	7.97	8.11	8.28	8.27	8.36	8.37	8.18	8.16	8.26	7.67	7.60	7.87	7.76
Phosphorus (Total), P	mg/l	-	2.34	<0.05	<0.05	0.11	0.08	<0.05	<0.05	<0.05	0.22	0.47	0.50	0.26	0.45
Phosphate, PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	6.14	<0.05	0.11	0.41	0.20	0.09	0.19	0.07	0.83	0.87	1.21	0.43	1.39
Potassium (Total), K	mg/l	-	15.17	1.86	2.43	1.65	2.26	2.45	1.70	1.75	2.01	2.23	50.03	10.09	4.66
Potassium (Dissolved), K	mg/l		7.81	0.77	1.07	1.02	1.09	1.07	0.74	0.76	1.09	4.67	2.27	4.27	2.22
Selenium (Total), Se	mg/l	0.04	0.04	0.02	0.01	0.02	0.01	<0.01	0.04	<0.01	0.02	0.05	0.04	0.37	0.02
Selenium (Dissolved), Se	mg/l		0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.02	0.15	0.01
Silicon (Dissolved), Si	mg/l	-	6.10	3.50	4.48	3.45	3.83	4.07	3.42	3.61	3.72	3.91	4.37	4.54	4.21
Silver (Total) , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver (Dissolved) , Ag	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium (Total), Na	mg/l	200.0	50.56	8.16	10.65	8.30	12.40	14.07	7.98	7.55	9.14	17.21	18.65	63.93	15.70
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	<5.0	<5.0	<5.0	8.40	<5.0	8.46	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Strontium (Total), Sr	mg/l	2.0	0.56	0.20	0.25	0.18	0.28	0.31	0.18	0.18	0.17	0.25	0.27	0.71	0.24
Strontium (Dissolved), Sr	mg/l		0.29	0.08	0.11	0.11	0.14	0.13	0.08	0.08	0.10	0.12	0.12	0.30	0.11
Total Dissolved Solids	mg/l	1000	240.0	62.0	82.0	80.0	82.00	92.00	58.00	62.00	78.00	106.0	104.0	236.0	102.0
Turbidity	NTU	5.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium (Total), U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium (Dissolved), U	mg/l		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc (Total), Zn	mg/l	5.00	0.11	0.03	0.07	0.04	<0.01	0.07	<0.01	0.06	0.05	0.06	0.02	0.05	0.06
Zinc (Dissolved), Zn	mg/l		0.04	0.01	0.02	0.02	<0.01	0.02	<0.01	0.02	0.02	0.03	0.01	0.02	0.03

Notes: mg/l indicates milligrams per liter; µS/cm indicates microSiemens per centimeter; mgO/l indicates milligrams oxygen per liter; meq/l indicates milliequivalent(s) per liter; µg/l indicates micrograms per liter; NTU indicates nephelometric turbidity unit(s).

Table C-2 Surface Water Organic Carbons

Constituents	Sample Number		SW-8	SW-13
	Lab Number		G740-3	G740-3
	Date		2019.9.16	2019.9.15
	Unit	Detection Limit	Result	Result
<b>Volatile Organic Carbons (VOCs)</b>				
1,1,1,2-Tetrachloroethane	µg/l	2	ND<2.0	ND<2.0
1,1,1-Trichloroethane	µg/l	2	ND<2.0	ND<2.0
1,1,2,2-Tetrachloroethane	µg/l	2	ND<2.0	ND<2.0
1,1,2-Trichloroethane	µg/l	2	ND<2.0	ND<2.0
1,1-Dibromoethane	µg/l	2	ND<2.0	ND<2.0
1,1-Dichloroethane	µg/l	2	ND<2.0	ND<2.0
1,1-Dichloroethene	µg/l	2	ND<2.0	ND<2.0
1,1-Dichloropropene	µg/l	2	ND<2.0	ND<2.0
1,2,3-Trichlorobenzene	µg/l	2	ND<2.0	ND<2.0
1,2,3-Trichloropropane	µg/l	2	ND<2.0	ND<2.0
1,2,4-Trichlorobenzene	µg/l	2	ND<2.0	ND<2.0
1,2,4-Trimethylbenzene	µg/l	2	ND<2.0	ND<2.0
1,2-Dibromo-3-chloropropane	µg/l	2	ND<2.0	ND<2.0
1,2-Dibromoethane	µg/l	2	ND<2.0	ND<2.0
1,2-Dichlorobenzene	µg/l	2	ND<2.0	ND<2.0
1,2-Dichloroethane	µg/l	2	ND<2.0	ND<2.0
1,2-Dichloropropane	µg/l	2	ND<2.0	ND<2.0
1,3,5-Trimethylbenzene	µg/l	2	ND<2.0	ND<2.0
1,3-Dichlorobenzene	µg/l	2	ND<2.0	ND<2.0
1,3-Dichloropropane	µg/l	2	ND<2.0	ND<2.0
1,4-Dichlorobenzene	µg/l	2	ND<2.0	ND<2.0
2-Butanone(MEK)	µg/l	2	ND<2.0	ND<2.0
2-Chlorotoluene	µg/l	2	ND<2.0	ND<2.0
2-Hexanone	µg/l	2	ND<2.0	ND<2.0
4-Chlorotoluene	µg/l	2	ND<2.0	ND<2.0
4-Methyl-2-pentanone	µg/l	2	ND<2.0	ND<2.0
Acetone	µg/l	2	2.39	3.26
Acrylonitrile	µg/l	2	ND<2.0	ND<2.0
Benzene	µg/l	2	ND<2.0	ND<2.0
Bromobenzene	µg/l	2	ND<2.0	ND<2.0
Bromochloromethane	µg/l	2	ND<2.0	ND<2.0
Bromodichloromethane	µg/l	2	ND<2.0	ND<2.0
Bromoform	µg/l	2	ND<2.0	ND<2.0
Bromomethane	µg/l	2	ND<2.0	ND<2.0
Carbon Disulfide	µg/l	2	ND<2.0	ND<2.0
Carbon tetrachloride	µg/l	2	ND<2.0	ND<2.0
Chlorobenzene	µg/l	2	ND<2.0	ND<2.0
Chloroethane	µg/l	2	ND<2.0	ND<2.0
Chloroform	µg/l	2	ND<2.0	ND<2.0
Chloromethane	µg/l	2	ND<2.0	ND<2.0

Constituents	Sample Number		SW-8	SW-13
	Lab Number		G740-3	G740-3
	Date		2019.9.16	2019.9.15
	Unit	Detection Limit	Result	Result
cis-1,2-Dichloroethene	µg/l	2	ND<2.0	ND<2.0
cis-1,3-Dichloropropene	µg/l	2	ND<2.0	ND<2.0
Dibromochloromethane	µg/l	2	ND<2.0	ND<2.0
Dibromomethane	µg/l	2	ND<2.0	ND<2.0
Dichlorodifluoromethane	µg/l	2	ND<2.0	ND<2.0
Ethylbenzene	µg/l	2	ND<2.0	ND<2.0
Hexachlorobutadiene	µg/l	2	ND<2.0	ND<2.0
Isopropylbenzene	µg/l	2	ND<2.0	ND<2.0
m,p-Xylene	µg/l	4	ND<4.0	ND<2.0
Methylene chloride	µg/l	2	ND<2.0	ND<2.0
Naphthalene	µg/l	2	ND<2.0	ND<2.0
n-Butylbenzene	µg/l	2	ND<2.0	ND<2.0
n-Propylbenzene	µg/l	2	ND<2.0	ND<2.0
o-Xylene	µg/l	2	ND<2.0	ND<2.0
p-Isopropyltoluene	µg/l	2	ND<2.0	ND<2.0
sec-Butylbenzene	µg/l	2	ND<2.0	ND<2.0
Styrene	µg/l	2	ND<2.0	ND<2.0
tert-Butylbenzene	µg/l	2	ND<2.0	ND<2.0
Tetrachloroethene(PCE)	µg/l	2	ND<2.0	ND<2.0
Toluene	µg/l	2	ND<2.0	ND<2.0
trans-1,2-Dichloroethene	µg/l	2	ND<2.0	ND<2.0
trans-1,3-Dichloropropene	µg/l	2	ND<2.0	ND<2.0
Trichloroethene(TCE)	µg/l	2	ND<2.0	ND<2.0
Trichlorofluoromethane	µg/l	2	ND<2.0	ND<2.0
Vinyl chloride	µg/l	2	ND<2.0	ND<2.0
Xylene(Total)	µg/l	4	ND<4.0	ND<2.0
Quality Control Compounds				
1,2-Dichloroethane-d4	µg/l	35.0	35.2	34.9
4-Bromofluorobenzene	µg/l	31.0	31.3	31.4
Toluene-d8	µg/l	30.0	29.8	29.5
Total Organic Carbon (TOC)				
TOC	mg/l	0.5*	4.24	4.92

Notes: mg/l indicates milligrams per liter; µg/l indicates micrograms per liter; ND indicates that the compound was not detected.

Detection limit refers to the laboratory's detection limits based on USEPA Drinking Water Standards.

\* There is no drinking water standard for TOC; 0.5 mg/l refers to the detection limit used by the laboratory.



Table C-3 Surface Water Bacteriology

Bacteriological Parameter	Sample No.		SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13
	Lab No.		L-538	L-539	L-540	L-541	L-542	L-543	L-544	L-545	L-546	L-550	L-551	L-552	L-553
	Sampling date:		2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.29	2019.8.30	2019.8.30	2019.8.30	2019.8.30
	Unit	MNS 0900:2018	Biokombinat									Shuvuun			
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	100	1,300,000	14,000	74	40,000	6,000	103	1,000	2,500	60,000	14,000	76,000	44,000	190,000
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	<0.00004	0.0004	30	0.0004	0.004	18	0.043	0.043	0.0004	<0.00004	0.0004	0.004	<0.00004
Total thermotolerant coliform and presumptive <i>Escherichia coli</i> FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	-	-	15	-	-	9	-	-	-	-	-	-	-
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<i>Clostridium perfringens</i> : MNS ISO 6461-2:1998	number/100 ml	ND	0.001	0.001	ND	0.001	0.01	ND	0.001	0.001	0.0001	0.00001	0.01	0.1	0.001

Notes: ml indicates milliliter(s); ND indicates that the bacteria were not detected.

Table C-4 Biokombinat Groundwater General Chemistry and Heavy Metals

		Sample ID:	BIO-TPW-1(a)	BIO-TPW-1(b)	BIO-TPW-1(c)	BIO-DUP02	BIO-TPW-2(b)	BIO-TPW-2(c)	BIO-DUP02	BIO-TPW-3(a)	BIO-TPW-3(b)	BIO-TPW-3(c)
		Lab ID:	L-15181	L-15186	L-15290	-	L-14823	L-14835	L-14834	L-14861	L15117	L-15104
		Sampling Date:	2019.9.19	2019.9.20	2019.9.21	-	2019.9.11	2019.9.12	2019.9.12	2019.9.13	2019.9.18	2019.9.17
Component	Units	MNS 0900:2018 Standard	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Aluminum /total/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Aluminum /dissolved/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic /total/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic /dissolved/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /total/, Ba	mg/l	0.70	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /dissolved/, Ba	mg/l	0.70	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium /total/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium /dissolved/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium /total/, Ca	mg/l	100.0	16.36	16.02	20.76	26.22	20.52	26.71	26.22	25.93	22.14	28.10
Calcium /dissolved/, Ca	mg/l	100.0	12.20	12.07	16.10	18.49	13.93	18.41	18.49	18.95	14.92	18.66
Chloride, Cl <sup>-</sup>	mg/l	350.0	<3.0	<3.0	6.81	10.21	6.81	10.21	10.21	13.61	5.10	6.81
Chromium /total/, Cr	mg/l	0.05	<0.005	<0.005	<0.005	0.015	0.011	0.011	0.015	0.012	<0.005	<0.005
Copper /total/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper /dissolved/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity, EC	µS/cm	1000	121.2	121.6	118.7	136.2	137.7	139.2	136.2	138.0	142.0	162.8
Total Hardness	mg-equ/l	7.00	0.77	0.77	0.97	1.12	0.88	1.11	1.12	1.15	0.96	1.14
Fluoride /F	mg/l	0.7-1.5	0.15	0.63	0.48	0.80	1.12	0.36	0.80	0.48	<0.05	0.38
Iron /total/, Fe	mg/l	0.30	0.102	0.091	0.075	0.090	0.109	0.076	0.090	0.505	0.067	0.065
Iron /dissolved/, Fe	mg/l	0.30	0.051	0.040	0.051	0.032	0.038	0.033	0.032	0.342	0.052	<0.03
Lead /total/, Pb	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead /dissolved/, Pb	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium /total/, Mg	mg/l	30.0	2.61	2.63	2.58	3.33	3.33	3.42	3.33	3.42	3.77	3.63
Magnesium /dissolved/, Mg	mg/l	30.0	1.95	2.00	2.01	2.37	2.26	2.38	2.37	2.50	2.64	2.50
Manganese /total/, Mn	mg/l	0.10	0.04	0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.05	<0.01	<0.01
Manganese /dissolved/, Mn	mg/l	0.10	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01
Mercury /dissolved/, Hg	µg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum /total/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	0.007	<0.005	<0.005	<0.005
Molybdenum /dissolved/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	2.23	0.83	1.39	0.79	0.72	0.57	0.79	0.16	0.25	3.25
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	-	6.5-8.5	7.62	8.10	8.02	7.74	7.76	7.51	7.74	7.76	7.57	7.39
Phosphate /PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	<0.05	<0.05	<0.05	0.16	0.18	0.19	0.16	0.46	<0.05	<0.05
Selenium /total/, Se	mg/l	0.04	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.01	<0.01	<0.01
Selenium /dissolved/, Se	mg/l	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Silver /total/, Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver /dissolved/, Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium /total/, Na	mg/l	200.0	7.51	7.98	8.02	8.88	8.95	9.06	8.88	7.76	8.46	8.05
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	6.84	<5.0	10.08	12.59	<5.0	<5.0	12.59	6.59	<5.0	12.42
Strontium /total/, Sr	mg/l	2.0	0.14	0.14	0.14	0.21	0.20	0.21	0.21	0.21	0.22	0.21
Strontium /dissolved/, Sr	mg/l	2.0	0.10	0.10	0.11	0.15	0.14	0.15	0.15	0.15	0.15	0.14
Total dissolved solid, TDS	mg/l	1000	74.0	70.0	88.0	96.0	80.0	90.0	96.0	96.0	86.0	98.0
Turbidity	NTU	5.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium /total/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium /dissolved/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc /total/, Zn	mg/l	5.00	<0.01	0.01	0.04	0.04	0.05	0.04	0.04	<0.01	<0.01	0.01
Zinc /dissolved/, Zn	mg/l	5.00	<0.01	0.01	0.03	0.02	0.03	0.02	0.02	<0.01	<0.01	<0.01
Notes:												

		Sample ID:	BIO-TPW-4	BIO-TPW-5(a)	BIO-TPW-5(b)	BIO-TPW-5(c)	BIO-TPW-5(d)	BIO-TPW-6(a)	BIO-TPW-6(b)	BIO-TPW-6(c)
		Lab ID:	L-7237	L-7282	L-7697	L-7970	L-14959	L15302	L-16099	L-16122
		Sampling Date:	2019.7.18	2019.7.19	2019.7.22	2019.7.23	2019.9.14	2019.9.23	2019.9.24	2019.9.25
Component	Units	MNS 0900:2018 Standard	Result	Result	Result	Result	Result	Result	Result	Result
Aluminum /total/, Al	mg/l	0.50	0.029	<0.025	<0.025	0.028	<0.025	<0.025	<0.025	<0.025
Aluminum /dissolved/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic /total/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic /dissolved/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /total/, Ba	mg/l	0.70	0.01	0.02	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Barium /dissolved/, Ba	mg/l	0.70	0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Cadmium /total/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium /dissolved/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium /total/, Ca	mg/l	100.0	19.61	20.96	20.31	17.83	26.71	14.98	13.31	21.37
Calcium /dissolved/, Ca	mg/l	100.0	13.16	16.57	15.05	14.93	20.67	11.48	11.44	16.66
Chloride, Cl <sup>-</sup>	mg/l	350.0	3.40	10.21	6.81	5.10	13.61	10.21	8.51	8.51
Chromium /total/, Cr	mg/l	0.05	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005
Copper /total/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper /dissolved/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity, EC	µS/cm	1000	129.0	155.0	151.9	146.5	145.1	82.0	81.8	106.3
Total Hardness	mg-equ/l	7.00	0.82	1.03	0.95	0.94	1.23	0.73	0.73	0.99
Fluoride /F	mg/l	0.7-1.5	0.16	0.60	0.39	0.48	0.76	0.39	<0.05	0.18
Iron /total/, Fe	mg/l	0.30	0.146	0.674	0.103	0.040	0.126	0.067	0.070	0.076
Iron /dissolved/, Fe	mg/l	0.30	0.100	0.547	0.041	0.125	0.043	0.039	0.051	0.047
Lead /total/, Pb	mg/l	0.01	0.02	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01
Lead /dissolved/, Pb	mg/l	0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Magnesium /total/, Mg	mg/l	30.0	3.02	3.22	3.91	3.65	3.17	2.52	2.26	2.40
Magnesium /dissolved/, Mg	mg/l	30.0	2.04	2.49	2.40	2.35	2.47	1.94	1.94	1.91
Manganese /total/, Mn	mg/l	0.10	<0.01	0.022	<0.01	<0.01	<0.01	0.02	0.01	0.01
Manganese /dissolved/, Mn	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
Mercury /dissolved/, Hg	µg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum /total/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum /dissolved/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	0.85	1.02	0.93	0.93	0.47	1.29	0.69	1.44
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	-	6.5-8.5	7.89	7.72	7.74	7.53	7.85	7.29	7.25	7.32
Phosphate /PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	<0.05	<0.05	<0.05	<0.05	0.39	<0.05	<0.05	<0.05
Selenium /total/, Se	mg/l	0.04	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Selenium /dissolved/, Se	mg/l	0.04	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Silver /total/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver /dissolved/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium /total/, Na	mg/l	200.0	5.77	10.66	8.41	8.35	10.45	5.73	5.63	5.39
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	9.12	14.51	10.16	9.98	12.72	5.96	5.46	9.87
Strontium /total/, Sr	mg/l	2.0	0.27	0.34	0.29	0.34	0.20	0.13	0.11	0.13
Strontium /dissolved/, Sr	mg/l	2.0	0.12	0.14	0.15	0.14	0.15	0.10	0.10	0.10
Total dissolved solid, TDS	mg/l	1000	80.00	102.0	94.00	92.00	112.0	68.0	68.4	86.0
Turbidity	NTU	5.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium /total/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium /dissolved/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc /total/, Zn	mg/l	5.00	0.17	0.04	0.03	0.04	0.05	0.01	0.01	<0.01
Zinc /dissolved/, Zn	mg/l	5.00	0.01	0.01	<0.01	0.02	0.01	0.01	0.01	<0.01
Notes:										

		Sample ID:	BIO-EBW-1	BIO-EBW-1 (d)	BIO-EBW-2	BIO-EBW-2 (d)	BIO-EBW-3	BIO-EBW-3(d)	BIO-EBW-4	BIO-EBW-5	BIO-EBW-6	BIO-EBW-7	BIO-DUP01	BIO-EBW-8
		Lab ID:	L-6831	L-15180	L-6996	L-15103	L-7000	L-15043	L-14958	L-8513	L-8554	L-14824	L-14822	L-14860
		Sampling Date:	2019.7.5	2019.9.19	2019.7.7	2019.9.17	2019.7.9	2019.9.16	2019.9.14	2019.7.25	2019.7.26	2019.9.11	2019.9.11	2019.9.14
Component	Units	MNS 0900:2018 Standard	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Aluminum /total/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Aluminum /dissolved/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic /total/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic /dissolved/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /total/, Ba	mg/l	0.70	-	<0.01	-	<0.01	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Barium /dissolved/, Ba	mg/l	0.70	-	<0.01	-	<0.01	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Cadmium /total/, Cd	mg/l	0.003	-	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium /dissolved/, Cd	mg/l	0.003	-	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium /total/, Ca	mg/l	100.0	16.06	21.26	15.12	21.36	14.17	24.93	24.82	15.93	17.70	21.40	23.26	24.87
Calcium /dissolved/, Ca	mg/l	100.0	12.44	14.98	12.03	19.74	12.69	17.52	19.24	13.54	14.55	16.39	16.48	16.21
Chloride, Cl <sup>-</sup>	mg/l	350.0	<3.0	3.40	<3.0	5.10	<3.0	13.61	10.21	3.40	3.40	10.21	17.02	13.61
Chromium /total/, Cr	mg/l	0.05	-	<0.005	-	<0.005	-	0.012	0.011	0.007	<0.005	0.010	0.011	0.025
Copper /total/, Cu	mg/l	2.00	<0.02	<0.02	<0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper /dissolved/, Cu	mg/l	2.00	<0.02	<0.02	<0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity, EC	µS/cm	1000	82.0	135.0	80.0	160.4	100.6	137.3	138.2	126.8	132.5	130.5	130.0	123.1
Total Hardness	mg-equ/l	7.00	0.78	0.93	0.77	1.15	0.80	1.08	1.17	0.83	0.90	1.00	1.00	0.99
Fluoride /F	mg/l	0.7-1.5	0.38	0.09	0.97	0.34	<0.05	0.28	0.07	0.45	0.53	1.63	0.38	0.65
Iron /total/, Fe	mg/l	0.30	<0.03	0.049	0.078	0.114	0.095	0.091	0.076	0.139	0.077	0.123	0.111	0.098
Iron /dissolved/, Fe	mg/l	0.30	0.030	<0.03	0.148	0.052	0.085	<0.03	0.026	0.042	0.030	0.037	0.039	0.030
Lead /total/, Pb	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01
Lead /dissolved/, Pb	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Magnesium /total/, Mg	mg/l	30.0	2.50	3.24	2.58	2.34	2.21	3.49	3.26	2.29	2.51	2.93	3.09	3.24
Magnesium /dissolved/, Mg	mg/l	30.0	1.99	2.26	2.09	1.98	2.01	2.54	2.54	1.93	2.06	2.21	2.20	2.17
Manganese /total/, Mn	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese /dissolved/, Mn	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury /dissolved/, Hg	µg/l	0.001	-	<0.001	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum /total/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum /dissolved/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	0.37	2.12	0.34	0.52	0.25	0.75	1.66	0.97	1.07	0.85	1.85	1.10
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	-	6.5-8.5	7.16	7.52	7.47	7.14	8.17	7.88	7.74	7.82	7.57	7.69	7.69	7.78
Phosphate /PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	0.40	<0.05	<0.05	0.13	0.18	0.54
Selenium /total/, Se	mg/l	0.04	-	<0.01	-	<0.01	-	<0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.01
Selenium /dissolved/, Se	mg/l	0.04	-	<0.01	-	<0.01	-	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Silver /total/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver /dissolved/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium /total/, Na	mg/l	200.0	5.12	7.19	6.64	4.74	4.88	8.01	7.18	5.18	5.74	6.56	7.15	8.61
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	11.24	6.23	10.33	24.63	19.76	<5.0	<5.0	9.06	11.18	8.23	6.59	<5.0
Strontium /total/, Sr	mg/l	2.0	-	0.17	-	0.12	-	0.21	0.19	0.16	0.16	0.15	0.17	0.19
Strontium /dissolved/, Sr	mg/l	2.0	-	0.12	-	0.10	-	0.15	0.14	0.11	0.13	0.12	0.12	0.13
Total dissolved solid, TDS	mg/l	1000	62.00	82.0	60.00	92.0	64.00	92.0	90.0	78.00	86.00	88.0	88.0	88.0
Turbidity	NTU	5.00	<10.0	<5.0	<10.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium /total/, U	mg/l	0.03	-	<0.10	-	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium /dissolved/, U	mg/l	0.03	-	<0.10	-	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc /total/, Zn	mg/l	5.00	<0.01	0.02	<0.01	0.02	0.06	0.06	0.01	0.01	0.04	0.03	0.05	0.05
Zinc /dissolved/, Zn	mg/l	5.00	<0.01	0.01	<0.01	0.01	0.14	0.02	0.01	0.07	0.02	0.02	0.04	0.03
Notes:														

Table C-5 Shuvuun Groundwater General Chemistry and Heavy Metals

		Sample ID:	SHU-TPW-1	SHU-TPW-2(a)	SHU-TPW-2(b)	SHU-TPW-2(c)	SHU-TPW-3(b)	SHU-TPW-3(c)	SHU-TPW-4(a)	SHU-TPW-4(c)	SHU-TPW-5(a)	SHU-TPW-5(b)	SHU-TPW-5(c)	SHU-TPW-6(a)	SHU-TPW-6(c)
		Lab ID:	L-9320	L-9414	L-10921	L-11010	L-11033	L-12151	L-13780	L-14033	L-14616	L-14731	L-14744	L-14173	L-14588
		Sampling Date:	2019.8.5	2019.8.6	2019.8.8	2019.8.9	2019.8.12	2019.8.13	2019.8.26	2019.8.27	2019.9.5	2019.9.6	2019.9.9	2019.9.2	2019.9.4
Component	Units	MNS 0900:2018 Standard	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS
Aluminum /total/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Aluminum /dissolved/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	2.31	2.05	2.05	<0.10	<0.10
Arsenic /total/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic /dissolved/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /total/, Ba	mg/l	0.70	0.07	0.07	0.03	0.03	0.06	0.03	0.02	0.03	0.03	0.03	0.03	0.02	0.02
Barium /dissolved/, Ba	mg/l	0.70	0.02	0.02	0.01	0.01	0.03	0.16	0.03	0.02	0.02	0.02	0.02	0.01	0.01
Cadmium /total/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium /dissolved/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium /total/, Ca	mg/l	100.0	74.36	72.13	64.88	67.37	69.08	67.19	51.76	74.94	56.63	54.19	51.59	55.49	52.79
Calcium /dissolved/, Ca	mg/l	100.0	47.48	46.39	45.27	45.19	16.44	47.16	42.42	44.46	33.57	33.58	35.74	31.65	33.75
Chloride, Cl <sup>-</sup>	mg/l	350.0	51.05	37.44	40.80	39.14	40.80	40.80	51.05	38.10	34.03	27.23	34.03	30.63	30.63
Chromium /total/, Cr	mg/l	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.016	0.014	0.012	0.014	0.011	0.011	0.013
Copper /total/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper /dissolved/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity, EC	µS/cm	1000	421.0	384.0	385.0	386.0	376.0	386.0	368.0	403.4	289.0	274.0	273.0	291.0	296.0
Total Hardness	mg-equ/l	7.00	3.09	3.00	2.93	2.93	2.93	3.04	2.70	2.79	2.16	2.16	2.28	2.04	2.15
Fluoride /F	mg/l	0.7-1.5	<0.05	0.38	0.26	0.28	0.32	0.12	0.22	0.59	0.10	0.05	0.10	<0.05	0.05
Iron /total/, Fe	mg/l	0.30	0.106	0.374	0.071	0.086	0.155	0.072	0.109	0.175	0.197	0.256	0.234	0.106	0.122
Iron /dissolved/, Fe	mg/l	0.30	0.090	0.236	0.053	0.050	0.109	0.050	0.066	0.065	0.080	0.106	0.091	0.051	0.031
Lead /total/, Pb	mg/l	0.01	0.01	0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01
Lead /dissolved/, Pb	mg/l	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium /total/, Mg	mg/l	30.0	12.40	12.98	11.63	12.12	12.80	11.99	9.45	11.74	9.77	9.47	8.59	<0.01	8.88
Magnesium /dissolved/, Mg	mg/l	30.0	8.80	8.29	8.19	8.25	8.30	8.39	7.14	6.94	5.88	5.92	5.98	5.62	5.70
Manganese /total/, Mn	mg/l	0.10	0.01	0.205	0.148	0.172	0.949	0.88	0.01	<0.01	3.39	2.90	2.64	0.15	0.15
Manganese /dissolved/, Mn	mg/l	0.10	0.01	0.130	0.103	0.121	0.618	0.61	0.02	<0.01	2.05	1.82	1.85	0.08	0.10
Mercury /dissolved/, Hg	µg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum /total/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	0.005	0.005	<0.005	<0.005	0.006
Molybdenum /dissolved/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	<0.01	<0.01	0.30	0.33	0.44	0.26	0.63	0.66	0.06	0.03	0.03	0.03	0.03
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	-	6.5-8.5	7.89	7.68	7.71	7.73	7.72	7.71	7.67	7.88	7.37	7.46	7.32	7.47	7.55
Phosphate /PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	<0.05	<0.05	0.24	0.36	<0.05	0.24	0.13	0.05	0.13	0.27	0.32	<0.05	<0.05
Selenium /total/, Se	mg/l	0.04	0.02	<0.01	<0.01	<0.01	0.03	0.04	0.01	<0.01	0.15	0.12	0.12	0.02	0.01
Selenium /dissolved/, Se	mg/l	0.04	0.01	<0.01	<0.01	<0.01	0.03	0.03	0.01	<0.01	0.09	0.08	0.08	0.01	0.01
Silver /total/, Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver /dissolved/, Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium /total/, Na	mg/l	200.0	36.08	26.75	20.62	21.78	25.14	27.23	27.63	37.06	29.02	26.08	23.14	19.77	20.05
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	34.11	17.64	18.90	30.40	12.30	22.62	16.46	38.10	14.81	<5.0	7.41	15.43	17.62
Strontium /total/, Sr	mg/l	2.0	0.69	0.70	0.62	0.65	0.67	0.64	0.37	0.61	0.53	0.49	0.45	0.43	0.42
Strontium /dissolved/, Sr	mg/l	2.0	0.44	0.45	0.44	0.44	0.44	0.45	0.42	0.36	0.31	0.30	0.31	0.25	0.27
Total dissolved solid, TDS	mg/l	1000	248.0	222.0	216.0	228.0	212.0	230.0	228.0	232.0	188.0	172.0	184.0	162.0	174.0
Turbidity	NTU	5.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium /total/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium /dissolved/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc /total/, Zn	mg/l	5.00	0.03	0.03	0.03	0.03	<0.01	0.05	0.03	0.04	0.02	<0.01	<0.01	<0.01	0.05
Zinc /dissolved/, Zn	mg/l	5.00	0.03	0.01	0.02	0.02	<0.01	0.03	0.04	0.02	0.01	<0.01	<0.01	<0.01	0.03
Notes:															



		Sample ID:	SHU-EBW-1	SHU-EBW-2	SHU-EBW-3	SHU-EBW-4	SHU-EBW-5	SHU-EBW-6	SHU-EBW-7	SHU-EBW-7(d)	SHU-EBW-8	SHU-EBW-9	SHU-EBW-10	SHU-DUP01
		Lab ID:	L-12413	L-12429	L-13498	L-12395	L-14106	L-13533	L-14589	L-14743	L-12467	L-14617	L-14166	L-14167
		Sampling Date:	2019.8.17	2019.8.19	2019.8.22	2019.8.15	2019.8.29	2019.8.23	2019.9.4	2019.9.9	2019.8.20	2019.9.5	2019.8.30	2019.8.30
Component	Units	MNS 0900:2018 Standard	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS
Aluminum /total/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Aluminum /dissolved/, Al	mg/l	0.50	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Ammonium, NH <sub>4</sub> <sup>+</sup>	mg/l	1.50	<0.10	<0.10	1.90	<0.10	<0.10	<0.10	0.15	0.21	<0.10	<0.10	0.38	0.41
Arsenic /total/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic /dissolved/, As	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium /total/, Ba	mg/l	0.70	0.02	0.03	0.02	0.02	0.03	0.01	0.02	0.02	0.03	0.04	0.02	0.02
Barium /dissolved/, Ba	mg/l	0.70	0.02	0.02	0.04	0.02	0.01	0.03	0.01	0.02	0.03	0.02	0.01	0.01
Cadmium /total/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium /dissolved/, Cd	mg/l	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium /total/, Ca	mg/l	100.0	54.50	63.53	72.99	51.95	70.06	54.79	64.60	60.95	61.40	87.22	59.34	57.34
Calcium /dissolved/, Ca	mg/l	100.0	43.22	45.16	52.82	39.19	36.67	36.80	39.38	42.49	43.28	45.45	37.29	36.83
Chloride, Cl <sup>-</sup>	mg/l	350.0	40.80	42.54	44.24	40.80	44.29	44.24	34.03	44.24	51.05	44.24	37.44	34.03
Chromium /total/, Cr	mg/l	0.05	<0.005	<0.005	<0.005	<0.005	0.015	0.01	0.012	0.012	<0.005	0.017	0.010	0.013
Copper /total/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper /dissolved/, Cu	mg/l	2.00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Conductivity, EC	µS/cm	1000	382.0	392.0	451.0	387.0	308.7	320.0	336.0	321.0	308.0	362.0	300.0	310.0
Total Hardness	mg-equ/l	7.00	2.70	2.85	3.33	2.52	2.35	2.31	2.50	2.70	2.74	2.85	2.36	2.34
Fluoride /F	mg/l	0.7-1.5	0.23	0.37	0.39	0.11	0.90	0.15	0.09	0.10	0.05	0.09	0.82	0.77
Iron /total/, Fe	mg/l	0.30	0.077	0.107	0.043	0.073	0.179	0.121	0.111	0.119	0.060	0.194	0.104	0.137
Iron /dissolved/, Fe	mg/l	0.30	0.051	0.036	0.074	0.068	0.048	0.095	0.038	0.044	0.077	0.055	0.046	0.038
Lead /total/, Pb	mg/l	0.01	0.01	0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01
Lead /dissolved/, Pb	mg/l	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Magnesium /total/, Mg	mg/l	30.0	8.23	10.18	11.66	9.18	12.00	7.09	10.53	10.06	9.89	13.50	9.73	9.57
Magnesium /dissolved/, Mg	mg/l	30.0	6.59	7.28	8.47	6.91	6.29	5.70	6.51	7.03	7.03	7.09	6.11	6.11
Manganese /total/, Mn	mg/l	0.10	<0.01	<0.01	2.13	0.08	<0.01	0.01	0.39	0.45	<0.01	0.02	1.01	0.99
Manganese /dissolved/, Mn	mg/l	0.10	<0.01	<0.01	2.94	0.06	<0.01	0.03	0.25	0.31	<0.01	0.01	0.63	0.63
Mercury /dissolved/, Hg	µg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum /total/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum /dissolved/, Mo	mg/l	0.07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate, NO <sub>3</sub> <sup>-</sup>	mg/l	50.00	0.52	0.48	0.06	0.43	0.60	0.79	0.03	0.06	0.16	0.03	0.60	0.60
Nitrite, NO <sub>2</sub> <sup>-</sup>	mg/l	1.00	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	<0.05
pH	-	6.5-8.5	7.45	7.44	7.62	7.63	7.72	7.58	7.43	7.15	7.38	7.26	7.69	7.63
Phosphate /PO <sub>4</sub> <sup>3-</sup>	mg/l	3.5	0.26	0.26	0.13	<0.05	<0.05	0.12	<0.05	<0.05	0.15	0.05	0.22	0.27
Selenium /total/, Se	mg/l	0.04	<0.01	<0.01	0.15	0.01	<0.01	<0.01	0.04	0.04	<0.01	0.02	0.06	0.07
Selenium /dissolved/, Se	mg/l	0.04	<0.01	<0.01	0.13	0.01	<0.01	<0.01	0.02	0.03	<0.01	0.01	0.02	0.03
Silver /total/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver /dissolved/ , Ag	mg/l	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium /total/, Na	mg/l	200.0	22.55	28.97	35.42	25.20	24.81	20.71	26.93	27.62	24.84	46.42	19.74	19.39
Sulfate, SO <sub>4</sub> <sup>2-</sup>	mg/l	500.0	36.20	35.40	17.90	27.10	6.75	10.70	23.76	24.70	16.58	28.81	<5.0	<5.0
Strontium /total/, Sr	mg/l	2.0	0.47	0.54	0.64	0.47	0.61	0.28	0.52	0.51	0.53	0.73	0.46	0.45
Strontium /dissolved/, Sr	mg/l	2.0	0.37	0.38	0.46	0.35	0.32	0.35	0.32	0.35	0.37	0.38	0.29	0.29
Total dissolved solid, TDS	mg/l	1000	224.0	232.0	264.0	214.0	178.0	194.0	200.0	218.0	216.0	234.0	178.0	178.0
Turbidity	NTU	5.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium /total/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium /dissolved/, U	mg/l	0.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc /total/, Zn	mg/l	5.00	0.03	0.03	0.02	<0.01	0.12	0.02	0.09	0.03	0.03	0.10	0.06	0.03
Zinc /dissolved/, Zn	mg/l	5.00	0.02	0.02	0.03	<0.01	0.03	0.03	0.05	0.02	0.02	0.05	0.02	0.02
Notes:														

Constituents	Sample Number		TPW-1	TPW-2(c)	DUP02	TPW-3	TPW-4	TPW-5(d)	TPW-6	EBW-1	EBW-2	EBW-3	EBW-4	EBW-5	EBW-6	EBW-7	DUP01	EBW-8
	Lab Number		G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3
	Date		2019.9.21	2019.9.12	2019.9.25	2019.9.17	2019.9.12	2019.9.14	2019.9.25	2019.9.19	2019.9.17	2019.9.16	2019.9.14	2019.9.12	2019.9.12	2019.9.12	2019.9.17	2019.9.13
	Unit	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Carbons (VOCs)																		
1,1,1,2-Tetrachloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1,1-Trichloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1,2,2-Tetrachloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1,2-Trichloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1-Dibromoethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1-Dichloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1-Dichloroethene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,1-Dichloropropene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2,3-Trichlorobenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2,3-Trichloropropane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2,4-Trichlorobenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2,4-Trimethylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2-Dibromo-3-chloropropane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2-Dibromoethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2-Dichlorobenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2-Dichloroethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
1,2-Dichloropropane	µg/l	2																

Constituents	Sample Number		TPW-1	TPW-2(c)	DUP02	TPW-3	TPW-4	TPW-5(d)	TPW-6	EBW-1	EBW-2	EBW-3	EBW-4	EBW-5	EBW-6	EBW-7	DUP01	EBW-8
	Lab Number		G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3
	Date		2019.9.21	2019.9.12	2019.9.25	2019.9.17	2019.9.12	2019.9.14	2019.9.25	2019.9.19	2019.9.17	2019.9.16	2019.9.14	2019.9.12	2019.9.12	2019.9.12	2019.9.17	2019.9.13
	Unit	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
cis-1,3-Dichloropropene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Dibromochloromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Dibromomethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Dichlorodifluoromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Hexachlorobutadiene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Isopropylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
m,p-Xylene	µg/l	4	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
Methylene chloride	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Naphthalene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
n-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
n-Propylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
o-Xylene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
p-Isopropyltoluene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
sec-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Styrene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
tert-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Tetrachloroethene(PCE)	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Toluene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
trans-1,2-Dichloroethene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
trans-1,3-Dichloropropene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Trichloroethene(TCE)	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Trichlorofluoromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Vinyl chloride	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Xylene(Total)	µg/l	4	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
Quality Control Compounds																		
1,2-Dichloroethane-d4	µg/l	35.0	35.2	35.1	35.1	35.7	35.4	35.5	35.1	35.2	35.9	35.1	35.6	35.9	35.5	35.4	35.6	35.4
4-Bromofluorobenzene	µg/l	31.0	31.7	31.4	31.7	30.7	31.3	31.3	31.8	31.3	30.9	31.7	31.2	30.9	31.5	30.6	31.3	31.6
Toluene-d8	µg/l	30.0	30.7	29.7	30.5	29.8	29.6	29.9	30.5	29.7	29.8	29.6	29.7	29.7	29.7	29.7	29.5	30.0
Total Organic Carbon (TOC)																		
TOC	mg/l	0.5*	2.13	0.840	1.72	0.840	0.560	2.07	1.67	1.05	2.06	2.32	0.720	1.14	0.710	2.16	0.860	1.09

Notes: mg/l indicates milligrams per liter; µg/l indicates micrograms per liter; ND indicates that the compound was not detected.  
Detection limit refers to the laboratory's detection limits based on USEPA Drinking Water Standards.  
\* There is no drinking water standard for TOC; 0.5 mg/l refers to the detection limit used by the laboratory.

### Table C-7 Shuvuun Groundwater Volatile Carbons

[illegible]

Constituents	Sample Number		TPW-1	TPW-2	TPW-3	TPW-4	TPW-5	TPW-6	EBW-1	EBW-2	EBW-3	EBW-4	EBW-5	EBW-6	EBW-7	EBW-8	EBW-9	EBW-10	DUP02
	Lab Number		G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3	G740-3
	Date		2019.9.13	2019.9.15	2019.9.13	2019.9.15	2019.9.15	2019.9.15	2019.9.13	2019.9.13	2019.9.15	2019.9.13	2019.9.15	2019.9.15	2019.9.15	2019.9.15	2019.9.15	2019.9.15	2019.9.15
	Unit	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Dibromochloromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Dibromomethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Dichlorodifluoromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Hexachlorobutadiene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Isopropylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
m,p-Xylene	µg/l	4	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0
Methylene chloride	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Naphthalene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
n-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
n-Propylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
o-Xylene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
p-Isopropyltoluene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
sec-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Styrene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
tert-Butylbenzene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Tetrachloroethene(PCE)	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Toluene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
trans-1,2-Dichloroethene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
trans-1,3-Dichloropropene	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Trichloroethene(TCE)	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Trichlorofluoromethane	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Vinyl chloride	µg/l	2	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Xylene(Total)	µg/l	4	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Quality Control Compounds																			
1,2-Dichloroethane-d4	µg/l	35.0	35.9	34.3	35.1	35.4	35.6	35.6	35.9	35.0	35.5	35.4	35.0	35.5	35.4	35.4	35.5	35.1	35.1
4-Bromofluorobenzene	µg/l	31.0	31.2	31.4	31.5	31.6	31.5	31.7	31.4	31.4	31.3	31.6	31.3	31.2	31.4	31.5	31.7	31.8	31.9
Toluene-d8	µg/l	30.0	29.7	29.7	29.9	29.9	29.5	29.8	29.9	30.0	29.9	29.8	29.7	30.0	30.0	30.0	30.0	29.8	30.0
Total Organic Carbon (TOC)																			
TOC	mg/l	0.5*	2.03	1.81	2.01	1.41	4.29	0.520	1.27	2.60	3.24	2.19	1.17	1.56	2.36	1.36	1.49	0.960	0.950

Notes: mg/l indicates milligrams per liter; µg/l indicates micrograms per liter; ND indicates that the compound was not detected.  
Detection limit refers to the laboratory’s detection limits based on USEPA Drinking Water Standards.  
\* There is no drinking water standard for TOC; 0.5 mg/l refers to the detection limit used by the laboratory.



Table C-8 Biokombinat Groundwater Bacteriology

Bacteriological Parameter	Sample No.		BIO-TPW-1(a)	BIO-TPW-1(b)	BIO-TPW-1(c)	BIO-TPW-2(b)	BIO-TPW-2(c)	BIO-DUP02	BIO-TPW-3(a)	BIO-TPW-3(b)	BIO-TPW-3(c)	BIO-TPW-4
	Lab No.		L-15181	L-15186	L-15290	L-14823	L-14835	L-14834	L-14861	L15117	L-15104	L-7237
	Sampling date:		2019.9.19	2019.9.20	2019.9.21	2019.9.11	2019.9.12	2019.9.12	2019.9.13	2019.9.18	2019.9.17	2019.7.18
	Unit	MNS 0900:2018	Test Pumping Wells (TPWs)									
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	100	27	12	1	81	24	4	124	13	3	23
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	ND	6	ND	ND	ND	ND	ND	8	ND	75
Total thermotolerant coliform and presumptive Escherichia coli FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Clostridium perfringens: MNS ISO 6461-2:1998	number/100 ml	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-

Bacteriological Parameter	Sample No.		BIO-TPW-5(a)	BIO-TPW-5(b)	BIO-TPW-5(c)	BIO-TPW-5(d)	BIO-TPW-6(a)	BIO-TPW-6(b)	BIO-TPW-6(c)	BIO-EBW-1	BIO-EBW-1 (d)
	Lab No.		L-7282	L-7697	L-7970	L-14959	L15302	L-16099	L-16122	L-6831	L-15180
	Sampling date:		2019.7.19	2019.7.22	2019.7.23	2019.9.14	2019.9.23	2019.9.24	2019.9.25	2019.7.5	2019.9.19
	Unit	MNS 0900:2018	Test Pumping Wells (TPWs)								EBWs
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	110	3	27		11	30	4	12	-	12
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	8,900	75	300		ND	21	ND	4	-	ND
Total thermotolerant coliform and presumptive Escherichia coli FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	1,300	6	100		ND	2	ND	10	-	ND
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	ND	ND		ND	ND	ND	ND	-	ND
Clostridium perfringens: MNS ISO 6461-2:1998	number/100 ml	-	-	-		ND	ND	ND	ND	-	ND

Bacteriological Parameter	Sample No.		BIO-EBW-2	BIO-EBW-2 (d)	BIO-EBW-3	BIO-EBW-3(d)	BIO-EBW-4	BIO-EBW-5	BIO-EBW-6	BIO-EBW-7	BIO-DUP01	BIO-EBW-8
	Lab No.		L-6996	L-15103	L-7000	L-15043	L-14958	L-8513	L-8554	L-14824	L-14822	L-14860
	Sampling date:		2019.7.7	2019.9.17	2019.7.9	2019.9.16	2019.9.14	2019.7.25	2019.7.26	2019.9.11	2019.9.11	2019.9.14
	Unit	MNS 0900:2018	Exploratory Borehole Wells (EBWs)									
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	100	-	2	14	8	7	2	89	9	73	45
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	-	ND	ND	11	ND	0	0	ND	ND	ND
Total thermotolerant coliform and presumptive Escherichia coli FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	-	ND	ND	7	ND	0	0	ND	ND	ND
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Clostridium perfringens: MNS ISO 6461-2:1998	number/100 ml	ND	-	ND	ND	ND	ND	-	-	ND	ND	ND

Note: ml indicates milliliter(s); ND indicates that the bacteria were not detected.

Table C-9 Shuvuun Groundwater Bacteriology

Bacteriological Parameter	Sample No.		SHU-TPW -1	SHU-TPW -2(a)	SHU-TPW -2(b)	SHU-TPW -2(c)	SHU-TPW -3(b)	SHU-TPW -3(c)	SHU-TPW -4(a)	SHU-TPW -4(c)	SHU-TPW -5(a)	SHU-TPW -5(b)	SHU-TPW -5(c)	SHU-TPW -6(a)	SHU-TPW -6(c)
	Lab No.		L-480	L-481	L-488	L-492	L-493	L-495	L-529	L-533	L-569	L-581	L-582	L-556	L-564
	Sampling date:		2019.8.5	2019.8.6	2019.8.8	2019.8.9	2019.8.12	2019.8.13	2019.8.26	2019.8.27	2019.9.5	2019.9.6	2019.9.9	2019.9.2	2019.9.4
	Unit	MNS 0900:2018	Test Pumping Wells (TPWs)												
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	100	38	14	49	16	14	28	6	44	64	5	23	9	2
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	87	1,300	23	0	80	73	300	29	6,000	187	13	83	22
Total thermotolerant coliform and presumptive Escherichia coli FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	1	160	0	0	89	1	74	36	110	32	2	8	2
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Clostridium perfringens: MNS ISO 6461-2:1998	number/100 M	ND	-	-	-	0	0	0	ND	ND	ND	ND	ND	ND	ND

Bacteriological Parameter	Sample No.		SHU-EBW -1	SHU-EBW -2	SHU-DUP01	SHU-EBW -3	SHU-EBW -4	SHU-EBW -5	SHU-EBW -6	SHU-EBW -7	SHU-EBW -7(d)	SHU-EBW -8	SHU-EBW -9	SHU-EBW -10	SHU-DUP02
	Lab No.		L-506	L-507	L-508	L-521	L-503	L-535	L-563	L-526	L-583	L-519	L-570	L-554	L-555
	Sampling date:		2019.8.17	2019.8.19		2019.8.22	2019.8.15	2019.8.29	2019.8.23	2019.9.4	2019.9.9	2019.8.20	2019.9.5	2019.8.30	2019.8.30
	Unit	MNS 0900:2018	Exploratory Borehole Wells (EBWs)												
Total Viable Count TVC: MNS ISO 6222:1998	number/1 ml	100	16	2	2	11	8	6	2	6	61	1	15	3	<1
Total Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	0	0	0	910	18	300	ND	60	1	0	25	ND	ND
Total thermotolerant coliform and presumptive Escherichia coli FC - Fecal Coliform: MNS ISO 9308-1:1998	number/100 ml	ND	0	0	0	0	1	74	ND	0	1	0	1	ND	ND
Pathogenic bacteria (Salmonella): MNS ISO 19250:2017	number/25 ml	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Clostridium perfringens: MNS ISO 6461-2:1998	number/100 ml	ND	0	0	0	0	0	ND	ND	0	ND	0	ND	ND	ND

Note: ml indicates milliliter(s); ND indicates that the bacteria were not detected.

Table C-10 Total, Fixed, and Volatile Solids in Center Core Samples

No	Site	River width, m	Sampling position at the site	Code name	Total solids, %	Fixed solids, % in total solids	Volatile solids, % in total solids
1.	D1.500	42	Center	D1.500-C2C	85.10	1.36	98.64
2.	D2.500	28	Center	D2.500-C2C	92.59	1.22	98.79
3.	D3.500	28	Left 20%C	D3.500-C3L20	72.73	2.11	97.89
4.	D4.500	77	Center	D4.500-C2C	81.95	2.74	97.26
5.	D5.500	35	Center	D5.500-C2C	97.26	1.12	98.88
6.	D6.500	22	Center	D6.500-C2C	60.35	4.28	95.72
7.	D7.500	48	Center	D7500-C2C	62.57	3.14	96.86
8.	D8.500	36	Center	D8.500-C2C	81.71	0.95	99.05
9.	D9.500	52	Center	D9.500-C2C	82.64	1.01	98.99
10.	D10.500	36	Center	D10.500-C2C	12.99	12.38	87.62
11.	D11.1000	117	Center	D11.1000-C2C	74.39	1.7	98.3
12.	D12.1000	72	Center	D12.1000-C2C	10.63	14.15	85.85
13.	D13.1000	73	Center	D13.1000-C2C	74.79	1.20	98.80
14.	D14.1000	58	Center	D14.1000-C2C	46.87	4.25	95.76
15.	D15.1000	53	Center	D15.1000-C2C	54.05	2.50	97.50
16.	D16.1000	32	Center	D16.1000-C2C	68.13	0.95	99.05
17.	D17.1000	34	Center	D17.1000-C2C	75.82	0.88	99.12
18.	D18.1000	36	Center	D18.1000-C2C	77.82	2.15	97.85
19.	D19.1000	77	Center	D19.1000-C2C	75.06	3.42	96.58
20.	D20.1000	47	Center	D20.1000-C2C	49.87	5.87	94.13
21.	D21.1000	72	Center	D21.1000-C2C	43.00	3.00	97.01
22.	D22.1000	69	Center	D22.1000-C2C	55.08	3.73	96.27
23.	D23.1000	45	Center	D23.1000-C2C	51.45	1.03	98.97
24.	D24.1000	42	Center	D24.1000-C2C	79.33	9.42	90.58
25.	D25.1000	68	Center	D25.1000-C2C	9.55	0.84	99.16
26.	D26.1000	40	Center	D26.1000-C2C	93.37	0.97	99.03
27.	D27.1000	52	Center	D27.1000-C2C	79.15	1.24	98.76
28.	D28.1000	50	Center	D28.1000-C2C	67.99	3.23	96.77
29.	D29.1000	49	Center	D29.1000-C2C	92.70	0.67	99.33
30.	D30.1000	34	Center	D30.1000-C2C	88.49	0.85	99.15
31.	D31.2000	39	Center	D31.2000-C2C	46.11	2.16	97.84
32.	D32.2000	39	Center	D32.2000-C2C	82.26	2.30	97.71
33.	D33.2000	40	Center	D33.2000-C2C	87.55	1.25	98.75
34.	D34.2000	43	Center	D34.2000-C2C	83.70	1.23	98.77
35.	D35.2000	39	Center	D35.2000-C2C	89.52	1.84	98.16
36.	D36	36	Center	D36-C2C	69.09	5.87	94.13
37.	D37	71	Left 20%	D37-C3L20	89.51	0.56	99.44
38.	D.Lun	78	Center	D.Lun-C2C	73.25	1.71	98.29
39.	U-100	23	Center	U.10-C2C	88.58	1.00	99.00
40.	U-250	39	Center	U.250-C2C	85.25	1.13	98.87
41.	U-500	20	Center	U.500-C2C	96.64	0.93	99.07
42.	P-1	32	Center	P.1-C2C	13.12	22.61	77.39
43.	P-2	34	Center	P.2-C2C	8.98	25.88	74.12
44.	P-3	32	Center	P.3-C2C	24.10	14.15	85.85
45.	P-4	32	Center	P.4-C2C	34.57	7.88	92.12
46.	P-5	21	Center	P.5-C2C	58.68	3.73	96.27
47.	P-6	12	Center	P.6-C2C	2.29	9.83	90.17

**Table C-11 Element Concentrations (milligrams per kilogram) in Sediment Samples**

Site	River width, meters	Sampling position at site	Al, %	Cu	Fe, %	Mn	Ni	Zn	As	Se	Cd	Pb	Cr	Cr6+	TP	TN
D1.500	42	Center	3.85	9.3	1.12	253	7.1	50	8	<2	0.06	17.4	57	9.59	361	0.812
D2.500	28	Center	4.25	14.1	1.64	347	12.9	89	5	<2	0.11	19.4	135	8.97	641	0.837
D3.500	28	Center	4.78	5.8	1.05	241	6.1	56	4	<2	0.08	17.2	59	4.41	397	0.346
D4.500	77	Center	3.92	6	0.98	221	6.4	50	1	<2	0.07	14.8	56	5.98	425	0.348
D5.500	35	Center	4.18	1.4	0.73	188	3.9	20	2	<2	<0.02	14	12	4.89	204	0.349
D6.500	22	Center	4.63	0.25	0.58	100	2.8	16	6	<2	<0.02	14.7	6	4.59	225	0.139
D7.500	48	Center	4.38	1	0.76	163	3.6	22	2	<2	<0.02	14.4	11	2.63	216	0.210
D8.500	36	Center	4.56	0.25	0.78	229	3.5	21	6	<2	0.02	15.1	10	3.13	208	0.138
D9.500	52	Center	4.3	2.5	0.97	216	5	32	7	<2	0.03	15.8	22	3.11	279	0.139
D10.500	36	Center	5.35	4.2	1.11	247	6.4	37	10	<2	0.09	16.5	35	3.19	336	0.415
D11.1000	117	Center	4.32	1.2	0.72	162	3.1	20	3	<2	0.02	15.3	7	3.06	202	0.138
D12.1000	72	Center	5.66	7.7	1.39	298	8.3	47	4	<2	0.06	18.1	52	4.94	472	0.487
D13.1000	73	Center	5.31	4.9	1.28	281	7	40	5	<2	0.05	16.1	33	3.64	355	0.348
D14.1000	58	Center	5.45	9.4	1.54	370	9.2	67	5	<2	0.08	17.2	72	7.40	525	0.687
D15.1000	53	Center	5.67	1	0.84	208	3.9	26	2	<2	0.02	14.6	12	2.81	225	0.130
D16.1000	32	Center	4.39	0.5	0.58	114	2.5	16	1	<2	<0.02	13.8	6	4.74	184	0.136
D17.1000	34	Center	4.71	1.2	0.65	133	3.4	23	1	<2	<0.02	13.4	20	4.09	270	0.135
D18.1000	36	Center	4.9	1.7	0.7	134	3.8	25	6	<2	<0.02	15.2	19	3.02	223	0.203
D19.1000	77	Center	4	8.6	1.11	259	7.9	80	5	<2	0.09	17.5	93	12.82	403	0.545
D20.1000	47	Center	4.3	5.7	0.7	197	3.8	57	5	<2	0.05	13.9	85	11.71	408	0.343
D21.1000	72	Center	5.08	3	0.79	165	4.2	32	8	<2	0.03	15.5	28	13.07	301	0.416
D22.1000	69	Center	5.01	8.5	1.31	303	8.6	58	6	<2	0.08	17.5	88	3.60	585	0.687
D23.1000	45	Center	5.7	9.8	1.66	409	10.3	66	10	<2	0.09	18.6	75	4.31	665	0.757
D24.1000	42	Center	4.52	25.5	1.7	508	12.7	197	15	<2	0.25	23.1	363	14.59	1497	2.681
D25.1000	68	Center	4.78	1.3	0.83	282	3.5	23	5	<2	<0.02	14.8	13	2.98	211	0.136
D26.1000	40	Center	3.7	1.8	0.75	180	3.9	22	10	<2	0.02	14.7	13	2.35	210	0.139

**Bulk Water Supply Expansion  
Environmental and Social Impact Assessment**

Site	River width, meters	Sampling position at site	Al, %	Cu	Fe, %	Mn	Ni	Zn	As	Se	Cd	Pb	Cr	Cr6+	TP	TN
D27.1000	52	Center	4.11	2.8	1.07	261	7.8	32	7	<2	0.03	14.6	37	2.77	291	0.208
D28.1000	50	Center	4.68	6.4	1.2	279	7.6	50	9	<2	0.08	17.8	46	6.81	451	2.600
D29.1000	49	Center	4.79	3	0.85	212	4.6	23	4	<2	0.02	14.5	10	3.41	175	0.138
D30.1000	34	Center	4.54	0.5	0.73	173	3.1	18	1	<2	<0.02	13.9	7	3.94	171	0.136
D31.2000	39	Center	4.93	0.5	0.79	180	3.6	20	5	<2	<0.02	13.8	9	1.97	200	0.135
D32.2000	39	Center	4.78	0.9	0.74	207	3.6	23	10	<2	<0.02	16.9	8	1.93	181	0.140
D33.2000	40	Center	5.59	5.2	1.52	358	8.4	43	5	<2	0.04	16.6	28	4.46	401	0.278
D34.2000	43	Center	5.88	7.9	1.55	377	9.3	70	10	<2	0.09	20.1	70	6.21	601	0.879
D35.2000	39	Center	4.31	3.4	1.07	305	5.1	37	4	<2	0.04	15.7	48	2.61	288	0.274
D.36	36	Center	4.47	12.1	0.82	288	5.7	20	3	<2	0.02	14.8	9	3.00	160	0.138
D.37	71	Left 20%C	3.88	4.3	0.61	179	2.9	17	3	<2	<0.02	14.7	5	3.26	166	0.139
D.Lun	78	Center	5.06	5.2	0.99	226	4.6	27	8	<2	0.03	16.4	8	3.98	191	0.137
U-100	23	Center	5.59	0.6	0.81	237	7.9	19	4	<2	<0.02	15.1	6	3.00	190	0.204
U-250	39	Center	3.97	13.8	1.72	521	11.5	94	11	<2	0.15	19.2	130	3.88	678	0.271
U-500	20	Center	3.33	1.9	0.76	198	5.2	20	8	<2	0.02	15.7	8	3.62	187	0.816
P-1	32	Center	4.35	56.2	2.12	579	17.1	402	14	<2	0.51	37.9	844	9.06	1985	0.137
P-2	34	Center	5.05	67.1	2.57	749	22	546	19	2	0.73	46.5	876	8.65	3737	0.136
P-3	32	Center	4.29	47.5	2.29	486	20.7	313	14	<2	0.6	40.7	633	9.24	1315	0.138
P-4	32	Center	4.18	0.8	0.93	288	4.6	21	10	<2	0.03	15.7	10	6.46	206	2.444
P-5	21	Center	4.56	5.4	1.39	408	8	46	5	<2	0.07	15.8	32	3.43	283	3.143
P-6	12	Center	5.09	5.1	1	324	6.4	43	3	<2	0.09	16.1	56	4.04	264	1.910
TEL				36			18	123	7.2		0.596	35	37			
PEL				197			36	315	41.6		3	91	90			

Notes: Orange shading indicates exceedance of threshold effect level (TEL); Red shading indicates exceedance of possible effect level (PEL).



## Appendix D Soil and Vegetation Communities in the Aol

### Soil profile No.T-1

Back slope of Songinokhairkhan mountain, western part of Ulaanbaatar city, land cover were under the heavy degraded with anthropogenic impact.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'52.00" E 106°40'36.00"

Altitude : 1290 meter above the sea level.

**Topography** : Back slope of Songinokhairkhan mountain

Landscape : foot slope of mountain

Slope gradient : 0-5°

Land cover : covered with small gravel and stone

Stone cover % : 10%

Soil erosion : low

Degradation factor : water induced erosion

Vegetation cover % : 10

**Soil type** : Mountain chestnut soil



*Soil horizontal (depth, cm)*



A (0-15) cm: Brown (10YR-4.4), common very fine to fine roots. Slightly moist, without stone and gravelly, low density with sand dominated horizon, vertical fault from seasonal freezing. Particles were loamy sand. Gradual smooth boundary with color and density.

AB (15-40) cm: Dark brown (10YR-5.6), moist, particles were loamy sand, few fine roots, low density with sub angular structure and very friable abrupt smooth.

B (40-60)cm: bright yellowish brown (5YR-7.6), dry, loamy clay and silt dominated particles, high density from deposited, few roots. Varisized gravel and fine sand and loose consisted. Light color from salt and carbonate deposition.

Soil profile	Depth (cm)	Chemical properties							Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
		pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %		Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
T-1	A	0-15	6.30	2.20	0.06	0.03	0.00	3.64	15.60	11.50	2.40	32.00
	AB	15-40	7.50	1.79	0.10	0.04	0.00	4.02	14.00	5.10	1.50	21.00
	B	40-60	8.00	1.62	0.07	0.03	0.00	3.44	16.90	0.70	1.20	12.00

Soil profile		Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>Profile 1</b>	A	5.60	37.00	40.20	7.60	7.40	2.3	17.2
	AB	11.50	39.20	31.50	11.00	3.50	3.3	17.8
	B	17.00	40.00	23.30	8.10	5.50	5.7	19.4

### Soil profile No.T-2.

Foot slope of Songinokhairkhan mountain and faced to north east direction.

Land cover were strong induced by anthropogenic impact

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°53'2.05" E 106°40'55.71"

Altitude : 1265 meter above the sea level.

**Topography** : north east slope of Songinokhairkhan mountain

Landscape : gully from mountain slope

Slope gradient : 0-5°

Land cover : covered with small gravel and stone

Stone cover % : 30%

Soil erosion : low

Degradation factor : technogen induced

Vegetation cover % : 10

**Soil type** : Mountain chestnut soil with gravelly / Tehcnosol from anthropogenic impact/



*Soil horizontal (depth, cm)*

Technosol of degraded area and haven't get information about soil profiles.

Soil profile	Depth (cm)	Chemical properties							Nutrient eq/100gr	mg-	Available nutrient, mg/100gr	
		pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca		Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-2</b>	A	0-15	7.20	1.82	0.06	0.03	0.00	4.58	15.90	3.10	1.60	23.00

Soil profile		Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>T-2</b>	A	13.70	50.30	20.40	1.70	6.40	7.5	15.6

### Soil profile No.T-3.

Steep slope of Songinokhairkhan mountain and faced to east direction.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'43.87" E 106°40'50.12"

Altitude : 1300 meter above the sea level.

**Topography** : East slope of Songinokhairkhan mountain

Landscape : steep slope

Slope gradient : 10-20°

Land cover : covered with small gravel and stone

Stone cover % : 30%

Soil erosion : low

Degradation factor : water induced

Vegetation cover % : 40

**Soil type** : Mountain chestnut soil with gravelly



*Soil horizontal (depth, cm)*

A (0-20) cm: Brown (10YR-4.6), moist, occur the gravel, low density, unclear structure with clay content. Top soil has common with fine roots. Particles was clay loamy sand. Gradual smooth boundary with color and density.

AB (20-30) cm: Bright brown (7.5YR-7.6), slightly moist, loamy sand, high density of sediment transportation in foot slope and unclear structure from density. Few fine roots and gradual smooth boundary. Sometimes white point from calcium carbonate.

Soil profile		Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-3</b>	A	0-20	7.00	1.99	0.17	0.08	0.00	5.57	13.80	4.20	1.70	10.00

Soil profile		Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>T-3</b>	A	6.30	34.30	37.50	10.50	6.10	5.3	21.9

### Soil profile No.T-4.

Gully on steep slope of Songinokhairkhan mountain and faced to east direction.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'47.48" E 106°40'41.51"

Altitude : 1300 meter above the sea level.

**Topography** : East slope of Songinokhairkhan mountain

Landscape : Gully of the slope

Slope gradient : 5-7°

Land cover : covered with small gravel and stone

Stone cover % : 30%

Soil erosion : low

Degradation factor : water induced

Vegetation cover % : 10

**Soil type** : Mountain chestnut soil with gravelly



*Soil horizontal (depth, cm)*

- A (0-40) cm: Dark brown (10YR-4.6), wet. Common with fine roots. High amount of gravel in horizon, volume-60%. Low density with sand dominated particles and unclear structure. Abrupt smooth boundary.
- Э (40-60) cm: sand dominated gravel layer. Bright (7.5YR-7.6), slight moist, Low density with particles were clay loamy sand and unclear structure. Few fine roots.
- C(60-70) cm: sediment deposition layer from fluvial processing of sheet and runoff. Gravel with sandy layer.

*To collect top soil samples for heavy metal contaminations*

**Soil profile No.T-5.**

Foot slope of Songinokhairkhan mountain and faced to west direction.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'36.77" E 106°41'10.41"

Altitude : 1260 meter above the sea level.

**Topography** : East faced slope of Songinokhairkhan mountain

Landscape : foot slope or pediment

Slope gradient : 5-12°

Land cover : covered with small gravel and stone

Stone cover % : 30%

Soil erosion : low

Degradation factor : water induced





Vegetation cover % : 10

**Soil type : Mountain chestnut soil with gravelly**



*Soil horizontal (depth, cm)*

A (0-20) cm: Dark brown (10YR-4.6), few fine roots wet, without gravelly, low density and single grain structure. Sandy clay loam particles. Abrupt smooth boundary.

AB (20-40) cm: Dark color (10YR-7.6), slightly moist, particles were clay dominated highly density. Few fine roots, structure is unclear. Boundary has abrupt smooth with density and particles.

Soil profile		Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-5</b>	A1	0-20	6.70	2.27	0.05	0.02	0.00	4.51	18.70	3.20	2.10	27.00
	AB	20-40	7.30	2.18	0.07	0.03	0.00	3.78	17.20	6.40	1.90	29.00

Soil profile		Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>T-5</b>	A1	10.70	39.90	29.70	12.80	5.10	1.8	19.8
	AB	11.60	37.00	34.30	11.90	3.20	2.1	17.2

#### **Soil profile No.T-6.**

Gully of foot slope of Songinokhairkhan mountain and faced to east direction.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'33.00" E 106°41'14.81"

Altitude : 1260 meter above the sea level.

**Topography** : East faced slope of Songinokhairkhan mountain

Landscape : Gully of pediment area, east faced slope mountain

Slope gradient : 1-2°

Land cover : covered with small gravel and stone

Stone cover % : 30%

Soil erosion : low

Degradation factor : water induced

Vegetation cover % : 10

**Soil type : Mountain chestnut soil with gravelly**







*Soil horizontal (depth, cm)*

- A (0-20) cm: Brown (10YR-4.6), strong roots from bushes. Moist, low content of small gravels and low density with gravel content. Grain structure of fine particles. Clay sandy loam particles and Abrupt smooth boundary with density.
- B<sub>ca</sub> (20-60) cm: Layer of Calcium carbonate. Bright (7.5YR-8.2), slightly moist, silt and clay dominated particles with highly density. Few fine roots. Unclear structure with density and fine particles.

**Soil pprofile No.T-7.**

Tuul river valley.

Date : 2019-June-25.

Position : Songinokhairkhan district, Ulaanbaatar

Coordinate : N 47°52'23.58" E 106°41'25.55"

Altitude : 1240 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : highly covered with grasses

Stone cover % : 0%

Soil erosion : low

Degradation factor : water induced

Vegetation cover % : 60

**Soil type** : Alluvial derno-soil



*Soil horizontal (depth, cm)*



- A<sub>d</sub> (0-6) cm: derno layer. Highly disturbed fine roots. Darker (7.5YR-5.6), wet, without stone, low density of root development, unclear structure from clay dominated particles. Smooth boundary with density and particles. Seasonal freezing influenced vertical fault with mixed the layers.
- (6-12) cm: Clay and silt dominated layer. Bright color with clay particles deposited. Strong root has developed. Without stone and gravel.
- A (12-30) cm: Dark brown (7.5YR-5.6), wet, low density with unclear structure. Clay dominated particles and few fine roots. Abrupt smooth boundary with color and density.
- B<sub>g</sub> (30-60) cm: Lightly (7.5YR-3.2), wet, particles were clay and silt dominated, low density from gravel contain. Few fine roots and not structured. Seasonal freezing affected vertical changes.

Soil profile	Depth (cm)	Chemical properties							Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
		pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %		Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-7</b>	A	6-30	7.80	1.22	0.22	0.11	0.00	2.55	14.20	4.00	1.30	18.00

Soil profile		Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>T-7</b>	A	0.70	49.30	28.60	8.50	8.10	4.8	22.4

### Soil profile No. T-8.

Tuul river valley near the Shuvuun part.

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

Coordinate : N 47°46'7.11" E 106°32'50.62"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : highly covered with grasses

Stone cover % : 0% o

Soil erosion : low

Degradation factor : anthropogenic

Vegetation cover % : 60



**Soil type** : Alluvial derno-soil /influenced by anthropogenic impact/ degraded



#### Soil horizon (depth, cm)

- A<sub>d</sub> (0-3) cm: Derno layer: heavily distributed fine roots. Dark brown (7.5YR-5.6), wet, low density with unclear structure, clay and silt dominated particles. Abrupt smooth boundary with color and density.
- A (3-25) cm: Brown (7.5YR-5.6), slightly moist, clay sandy loamy particles with unclear structure. Few fine roots. Smooth boundary with color and particles.
- B<sub>g</sub> (20-60) cm: Bright (7.5YR-7.4), slightly moist, clay sandy loamy particles, high density with fine particle. Smooth orange color from gleyed processing.

Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient eq/100gr	mg-	Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %			P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-8</b>	A	3-10	6.90	2.68	0.88	0.43	0.00	5.06	26.30	2.00	1.90	7.00
	Bg	10-60	6.80	1.99	0.04	0.02	0.00	4.26	12.10	6.90	1.50	3.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>Profile.8</b>	A	7.60	40.60	27.40	7.60	9.20	7.7	24.5
	Bg	4.40	55.40	24.10	8.80	3.80	3.5	16

### Soil profile No. T-9.

Tuul river valley near the Shuvuun part.

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

Coordinate : N 47°45'46.26" E 106°32'0.57"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : highly covered with grasses

Stone cover % : 0% o

Soil erosion : low

Degradation factor : anthropogenic

Vegetation cover % : 60

**Soil type** : Alluvial derno-soil



### Soil horizon (depth, cm)



A<sub>d</sub> (0-6) cm: Alluvial derno layer: heavily distributed fine roots. Dark brown (7.5YR-5.6), wet, without stone and gravel, low density, subangular structure. Particles were dominated with clay and silty. Gradual smooth boundary

A (6-10) cm: Organic layer. Darker (7.5YR-5.4), wet, Clay loamy particle, low density. Angular structure. Few fine roots.

B (10-40) cm: Lightly (7.5YR-8.6), slightly moist, clay loamy particle with sandy layer, density increased with fine particles. Haven't clear structure. Yellow point marked from gleyes.

D (below 40 cm) cm: Gravel and stone



Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-9</b>	A	0-10	8.10	1.98	0.14	0.06	0.00	2.97	14.90	8.20	2.20	25.00
	B	10-40	7.90	1.81	0.06	0.03	0.00	4.28	11.70	5.10	1.60	11.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>Profile.9</b>	A	5.40	52.10	24.50	5.90	7.50	4.6	18
	B	8.20	52.90	23.60	4.70	6.20	4.4	15.3

### Soil profile No. T-10.

Tuul river valley near the Shuvuun part.

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

Coordinate : N 47°45'41.00" E 106°31'50.00"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : highly covered with grasses

Stone cover % : 0% o

Soil erosion : low

Degradation factor : anthropogenic

Vegetation cover % : 60

**Soil type** : Alluvial derno-soil



#### Soil horizon (depth, cm)

- A<sub>d</sub> (0-5) cm: Alluvial derno layer: heavily distributed fine roots. Dark brown (7.5YR-5.6), wet, without stone and gravel, low density, subangular structure. Particles were dominated with clay and silty. Gradual smooth boundary with color and roots.
- A (5-20) cm: Organic deposition layer. Brown (7.5YR-5.6), wet, sandy clay loamy with low density, subangular structure. Few fine roots with without gravel. Gradual smooth boundary with color
- AB (20-30) cm: Darker (7.5YR-5.6), brightly moist, particles were dominated with sand, common fine roots. subangular structure with low density. Gradual smooth boundary
- B (30-50) cm: sandy layer with small gravel deposition.

Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
T-10	A	4-20	7.80	2.75	1.49	0.74	0.00	5.27	22.00	3.20	2.30	8.00
	AB	20-30	7.40	1.85	0.07	0.03	0.00	4.29	15.00	5.20	2.00	3.00
	B	30-50	6.90	1.08	0.05	0.03	0.00	3.55	6.90	3.10	1.80	3.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
Profile.10	A	7.50	44.10	28.00	4.70	7.60	8.2	20.5
	AB	9.50	62.30	14.90	3.60	8.20	1.4	13.3
	B	2.20	55.70	21.50	4.80	7.40	8.4	20.6

### Soil profile No. T-11.

Around the main road on the Tuul river valley near the Shuvuun part.

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

Gravel mining near the main road

Coordinate : 47°48'52.00" E 106°38'43.00"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : gravel and Artemisia

Stone cover % : 0% o

Soil erosion : strong

Degradation factor : anthropogenic

Vegetation cover % : 20

**Soil type** : Technosols in degraded area

Soil horizon (depth, cm) Haven't soil profile in degraded area, cause of mixed by anthropogenic impacts



Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
T-11	E	0-15	7.90	2.59	0.09	0.04	0.99	3.28	13.80	12.20	1.90	12.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
Profile.11	E	16.30	31.40	29.60	4.30	6.70	11.6	22.7



## Soil profile No. T-12.

Around the river stream on the Tuul river valley near the airport-Biokombinat area

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar  
airport-Biokombinat area

Coordinate : N 47°51'26.37" E 106°42'0.77"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : gravel and grasses

Stone cover % : 0% o

Soil erosion : medium

Degradation factor : anthropogenic

Vegetation cover % : 20

**Soil type** : Alluvial derno-soil



*Soil horizon (depth, cm)*

- A<sub>d</sub> (0-3) cm: Alluvial derno layer: heavily distributed fine roots. Dark brown (7.5YR-5.4), wet, without stone and gravel, low density, subangular structure. Particles were dominated with clay and silty. Gradual smooth boundary with color and roots.
- A (3-12) cm: Organic deposition layer. Brown (7.5YR-5.6), wet, sandy clay loamy with low density, subangular structure. Few fine roots with without gravel. Gradual smooth boundary with color
- B (12-30) cm: Lightly (7.5YR-7.6), wet, particles were dominated with sand, without roots and unclear structure with sand and gravel deposition layer.

Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
T-12	A	0-12	6.70	2.17	0.06	0.03	0.16	2.51	8.00	13.20	1.80	24.00
	AB	12-30	6.60	0.58	0.07	0.03	0.00	5.24	7.00	2.20	0.70	10.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
Profile.12	A	24.70	33.30	25.40	9.00	5.70	2	16.7
	AB	39.90	41.80	8.60	1.80	5.10	2.8	9.8

### Soil profile No. T-13.

Around the river stream on the Tuul river valley near the airport-Biokombinat area

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

airport-Biokombinat area

Coordinate : N 47°51'33.00" E 106°42'28.00

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : gravel and grasses

Stone cover % : 0% o

Soil erosion : medium

Degradation factor : anthropogenic and water induced

Vegetation cover % : 40

**Soil type** : **Meadowish kashtanozem soil**



*Soil horizon (depth, cm)*

- A (0-12) cm: Darker brown (7.5YR-5.6), common fine roots. wet. High contain of gravel and non-stable structure, sandy clay loamy particles. Gradual smooth boundary
- B (12-30) cm: Lightly (7.5YR-7.6), dried, clay loamy particles. Subangular structure. Gravel and small stone contain around 20%. Gradual smooth boundary with particles

Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>T-13</b>	A	0-30	6.70	1.40	0.04	0.02	0.00	4.42	14.90	2.00	1.50	12.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
<b>Profile.13</b>	A	27.30	43.70	18.30	1.20	4.00	4	10.7

### Soil profile No. T-14.

Around the river stream on the Tuul river valley near the airport-Biokombinat area

Date : 2019-June-25.

Position : Khan-Uul district, Ulaanbaatar

airport-Biokombinat area

Coordinate : N 47°51'48.59" E 106°42'46.44"

Altitude : 1220 meter above the sea level.

**Topography** : Valley of Tuul river

Landscape : Alluvial stream

Slope gradient : 0°

Land cover : gravel and grasses

Stone cover % : 0% o

Soil erosion : medium

Degradation factor : anthropogenic and water induced

Vegetation cover % : 20

**Soil type** : Alluvial derno-soil



*Soil horizon (depths, cm)*



- Ad (0-4) cm: Alluvial derno layer: heavily distributed fine roots. Dark brown (7.5YR-5.6), wet, without stone and gravel, low density, sub angular structure. Particles were dominated with clay and silty. Gradual smooth boundary with color and roots
- A (4-23) cm: transportation layer. Brown (7.5YR-6.6), wet, sandy clay loamy with low density, sub angular structure. Few fine roots with without gravel. Gradual smooth boundary with color. Seasonal freezing has influenced soil profiles and mixed the horizontal properties.
- B (23-50) cm: Brown (7.5YR-4.2), wet, clay loamy particles, few fine roots. Without gravel and yellow point from gleyes

Soil profile	Layer	Depth (cm)	Chemical properties						Nutrient mg-eq/100gr		Available nutrient, mg/100gr	
			pH	Humus content %	EC dSm	Salt %	CO <sub>2</sub> %	NO <sub>3</sub> %	Ca	Mg	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
T-14	Ad	0-4	6.40	1.44	0.08	0.04	0.00	6.01	17.10	0.90	1.30	12.00
	A	4-23	6.30	1.17	0.03	0.02	0.00	3.55	13.10	1.90	1.00	10.00
	B	23-40	6.20	1	0.03	0.02	0.00	2.87	10.80	2.20	0.60	8.00

Soil profile	Layer	Particle size %-of mm						
		1-0.25	0.25-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001	<0.01
Profile 14	Ad	2.10	60.60	21.00	7.30	3.60	3.6	16.3
	A	0.90	55.50	25.80	9.60	2.80	2.8	17.8
	B	4.60	30.90	35.50	40.00	8.90	8.6	24.4

Table D-1 Vegetation communities in Aol

No	Name by Families, Genera and Species	Species Volume	Sampling Location Number
<b>Gramineae Juss</b>			
1	Setaria P. B.		
1	Setaria viridis (L.) P.B.	Cop 3	3, 6
2	Achnatherum P.B..		
2	Achnatherum splendens (Trin.) Kunth	Cop 1	2
3	Stipa L.		
3	Stipa Krylovii Roshev	Cop 3	1, 2, 3, 4, 8, 9, 12, 17, 18, 19, 20
4	Alopecurus L.		
4	Alopecurus pratensis L	Cop 1	17, 18
5	Agrostis L.		
5	Agrostis mongholica Roshev	Cop 3	11
6	Cleistogenes Keng.		
6	Cleistogenes squarrosa (Trin.) Keng.	Cop 1	8, 9, 12, 19, 20
7	Koeleria Pers.		
7	Koeleria macrantha (Ldb.), Shult	Cop 3	1, 2, 4, 8, 9, 12, 13
8	Poa L.		
8	Poa pratensis L	Cop 1	7, 11
9	Poa botryoides Trin	Cop 1	8, 9, 11, 12, 13
9	Festuca L.		
10	Festuca lenensis Drob	Cop 3	4
10	Puccineillia Parl.		
11	Puccineillia tenuiflora (Griseb.) Scribn.et Merr	Sol	2
11	Agropyron Gaertn.		
12	Agropyron cristatum (L.) P.B	Cop 2	1, 2, 4, 8, 9, 12
12	Hordeum L.		
13	Hordeum brevisubulatum (Trin.) link	Cop 2	8, 9, 10, 12, 13, 17, 18
13	Elytrigia Desv.		
14	Elytrigia repens (L.) Desv. ex Nevski	Cop 1	1, 2, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20
14	Eragrostis Wolf.		
15	Eragrostis minor Host	Cop 1	3, 6
15	Elymus L.		
16	Elymus dahuricus Turcz. ex Griseb	Cop 2	8, 9, 10, 12, 13
<b>2 Cyperaceae Juss</b>			
16	Carex L.		
17	Carex duriuscula C.A.Mey	Cop 2	1, 2, 3, 4, 7, 8, 9, 10, 12, 13, 17, 18, 19, 20
<b>3 Alliaceae</b>			
17	Allium L.		
18	Allium prostratum Trev	Sol	1, 2, 4
19	Allium odorum L	Sp	13
20	Allium senescens L	Sol	13
<b>4 Iridaceae Juss</b>			
18	Iris L.		
21	Iris lactea Pall	Cop 3	7
22	Iris tigrida Bge	Sp	4
<b>5 Salicaceae Mirb</b>			
19	Salix L.		

No	Name by Families, Genera and Species	Species Volume	Sampling Location Number
23	Salix Ledebouriana Trautv	Cop 3	21
24	Salix pseudopentandra Flod	Cop 3	21
25	Salix dasyclados Wimm	Cop 3	21
26	Salix rosmarinifolia L	Cop 3	21
<b>6 Ulmaceae Mirb.</b>			
20	Ulmus L.		
27	Ulmus pumila L	Cop 3	6
<b>7 Urticaceae Juss</b>			
21	Urtica L.		
28	Urtica cannabina L	Cop 1	2, 3, 5, 6
<b>8 Polygonaceae Juss</b>			
22	Rheum L.		
29	Rheum undulatum L	Sol	2, 4, 8
23	Rumex L.		
30	Rumex thyrsoiflorus Fingerh	Cop 2	8, 9, 12
31	Rumex Gmelinii Turcz	Sol	21
24	Polygonum L.		
32	Polygonum lapathifolium L	Sol	21
<b>9 Chenopodiaceae Vent</b>			
25	Chenopodium L.		
33	Chenopodium album L	Cop 2	2, 3, 5, 6, 10
34	Chenopodium aristatum L	Cop 2	3, 6
35	Chenopodium glaucum L	Cop 2	17, 18
26	Axyris L.		
36	Axyris prostrata L	Cop 1	2, 10
27	Corispermum L.		
37	Corispermum declinatum Steph	Cop 2	17, 18
28	Salsola L.		
38	Salsola collina Pall	Sol	3, 4, 6
39	Salsola pestifera Nels	Cop 1	3, 6
29	Kochia Roth.		
40	Kochia prostrata (L.) Schrad	Cop 2	1, 2
<b>10 Amaranthaceae Juss</b>			
30	Amaranthus L.		
41	Amaranthus retroflexus L	Cop 1	4, 17, 18
<b>11 Caryophyllaceae Juss.</b>			
31	Stellaria L.		
42	Stellaria dichotoma L	Sp	5, 10, 19
32	Arenaria L.		
43	Arenaria cappilaris Poir	Cop 1	1, 2, 3, 8, 9, 12, 19, 20
33	Silene L.		
44	Silene jennisensis Willd	Sol	1, 4, 8, 12
45	Silene repens Patr	Sol	3, 6, 9, 13, 20
<b>12 Ranunculaceae Juss.</b>			
34	Leptopyrum Rchb.		
46	Leptopyrum fumarioides (L.) Reichb	Cop 1	2, 3, 6
35	Delphinium L.		
47	Delphinium grandiflorum L	Sol	8, 9, 12
36	Ranunculus L.		
48	Ranunculus japonicus Thunb	Sol	8, 9, 12, 13



№	Name by Families, Genera and Species	Species Volume	Sampling Location Number
49	Ranunculus pedatifidus Smith	Sol	8, 9, 12
50	Ranunculus repens L	Sol	11
37	Thalictrum L.		
51	Thalictrum squarrosum Steph.ex Willd	Sol	13
<b>13 Cruciferae Juss</b>			
38	Lepidium L.		
52	Lepidium densiflorum Schrad	Cop 1	2, 3, 6
53	Lepidium ruderales L	Cop 3	10, 17, 18
39	Capsella Medic.		
54	Capsella bursa-pastoris (L.) Medic	Cop 1	17, 18
40	Dontostemon Andrz.		
55	Dontostemon integrifolius (L.) C.A.	Sol	3, 4, 6, 19, 20
<b>14 Papaveraceae Juss</b>			
41	Papaver L.		
56	Papaver nudicaule L	Sol	8
42	Chiazospermum Bernh.		
57	Chiazospermum erectum Bern.	Sol	2
<b>15 Crassulaceae DC</b>			
43	Orostachys Fusch.		
58	Orostachys spinosa (L.) C.A. Mey.	Sol	4, 20
<b>16 Rosaceae Juss</b>			
44	Potentilla L.		
59	Potentilla anserina L	Cop 1	7, 17, 18, 19, 21
60	Potentilla supina L	Cop 1	10, 17, 18
61	Potentilla bifurca L	Cop 1	1, 2, 3, 5, 8, 9, 10, 12, 13
62	Potentilla acaulis L	Cop 1	1, 2, 3
63	Potentilla strigosa Pall.ex Pursh	Cop 1	2, 4, 8, 9, 12
64	Potentilla tanacetifolia Willd.ex Schlecht	Cop 1	2, 3, 4, 6
65	Potentilla multifida L	Sol	2, 8, 9, 10, 12, 13, 19
45	Sibbaldianthe Juz.		
66	Sibbaldianthe adpressa (Bge.)Juz	Cop 1	1, 2, 3, 9, 13, 19
46	Chamaerhodos		
67	Chamaerhodos erecta (L) Bge.-	Sol	1, 2, 3, 6, 8, 9, 12
47	Sanguisorba L.		
67	Sanguisorba officinalis L	Cop 1	7, 11
<b>17 Leguminosae Juss.</b>			
48	Medicago L.		
69	Medicago falcata L	Cop 1	1, 13, 17, 18, 19
49	Trifolium L.		
70	Trifolium lupinaster L	Cop 1	8, 9, 11, 12, 21, 22
50	Caragana Lam.		
71	Caragana pygmaea (L.) DC.	Sol	1, 2, 3, 4
72	Caragana microphylla (Pall) Lam	Sol	2
51	Thermopsis R. Br.		
73	Thermopsis lanceolata R.Br	Sol	1
52	Astragalus L.		
74	Astragalus galactites Pall	Sol	1, 2, 3, 5
75	Astragalus adsurgens Pall	Cop 1	1, 8, 9, 11, 12, 21, 22
53	Oxytropis DC.		
76	Oxytropis oxyphylla (Pall.) DC	Sol	4, 8, 9, 12

No	Name by Families, Genera and Species	Species Volume	Sampling Location Number
77	Oxytropis filiformis DC	Sol	4
78	Oxytropis salina Vass	Cop 1	21
54	Vicia L.		
79	Vicia multicaulis Ldb.	Sol	8, 9, 11, 12
<b>18 Geraniaceae Juss.</b>			
55	Geranium L.		
80	Geranium pratense L.	Sol	8, 9, 12, 21
<b>19 Rutaceae Juss</b>			
56	Haplophyllum Juss.		
81	Haplophyllum dahuricum (L.) G. Don	Sp	1, 4
<b>20 Umbelliferae Juss</b>			
57	Bupleurum L.		
82	Bupleurum bicaule Helm.	Sol	1, 2, 4, 8, 9, 12, 13
58	Carum L.		
83	Carum carvi L.	Cop 1	11, 13, 21, 22
<b>21 Primulaceae Vent</b>			
59	Androsace L.		
84	Androsace incana Lam.	Sol	4
<b>22 Boraginaceae Juss</b>			
60	Lappula Fabr.		
85	Lappula intermedia (Ldb.) M.Pop.-	Cop 1	3, 6
61	Amblynotus Johnst.		
86	Amblynotus rupestris (Pall.) M. Pop.ex Serg	Sol	4
<b>23 Convolvulaceae Juss</b>			
62	Convolvulus L.		
87	Convolvulus Ammanii Desr	Cop 1	2, 3, 5
<b>24 Plantaginaceae Juss.</b>			
63	Plantago L.		
88	Plantago depressa Willd	Sol	2, 8, 9, 10, 11, 12, 17, 18, 20, 21, 22
<b>25 Rubiaceae Lindl.</b>			
64	Galium L.		
89	Galiur verum L	Sol	2, 8, 9, 11, 12, 13
<b>26 Labiaceae Lindl</b>			
65	Panzeria Moench.		
90	Panzeria lanata (L.) Bge.	Cop 1	2, 4
66	Dracocephalum L.		
91	Dracocephalum foetidum Bge.	Sol	1, 2, 17, 18
67	Leonurus L.		
92	Leonurus sibiricus L	Cop 1	3, 6
68	Thymus L.		
93	Thymus dahuricus Serg	Cop 1	4, 19
<b>27 Scrophulariaceae Juss</b>			
69	Veronica L.		
94	Veronica incana L	Sol	4
70	Pedicularis L.		
95	Pedicularis flava Pall	Sol	4
96	Pedicularis myriophylla Pall	Sol	8, 9, 11, 12, 13
71	Cymbaria L.		
97	Cymbaria dahurica L	Cop 1	1, 2, 4
<b>28 Campanulaceae Juss.</b>			

Nº	Name by Families, Genera and Species	Species Volume	Sampling Location Number
72	Adenophora Fisch.		
98	Adenophora stenanthina (Ldb.) Kitag	Sol	8, 9, 11, 12
<b>29 Asteraceae Dumort</b>			
73	Heteropappus Less.		
99	Heteropappus hispidus (Thunbg.) Less	Cop 1	1, 2, 4, 8, 9, 12, 13, 17, 18, 19
74	Arctogeron DC.		
100	Arctogeron gramineum (L.) DC	Sol	2, 4
75	Inula L.		
101	Inula britannica L	Sol	11, 13, 22
76	Leontopodium R. Br. ex Gass.		
102	Leontopodium Leontopodioides (Willd.) Beauvd	Sol	18, 19
77	Artemisia L.		
103	Artemisia palustris L	Cop 1	8, 9, 12, 17, 18, 19, 20, 22
104	Artemisia anethifolia Web. ex Stechm	Cop 1	11, 21, 22
105	Artemisia macrocephala Jacquem	Cop 1	21, 22
106	Artemisia scoparia Waldst. et Kit	Cop 1	13
107	Artemisia laciniata Willd	Cop 1	8, 9, 11, 12, 13, 20, 22
108	Artemisia frigida Willd	Cop 3	1, 2, 3, 4, 8, 9, 12, 13, 17, 18, 19
109	Artemisia rutifolia Steph. ex Spreng	Cop 3	4
110	Artemisia Adamsii Bess	Cop 1	1, 2, 4, 17, 19, 20
111	Artemisia pectinata Pall	Cop 1	1, 2, 3, 8, 9, 12
78	Saussurea		
112	Saussurea dahurica Adams	Sol	11
113	Saussurea amara DC	Cop 3	10, 22
79	Scorzonera L.		
114	Scorzonera austriaca Willd	Cop 1	1, 2, 4
80	Cirsium Mill.		
115	Cirsium esculentum L	Cop 1	8, 11, 13, 21, 22
81	Taraxacum		
116	Taraxacum dissectum (Ldb.)	Cop 1	2, 7, 11, 13, 17, 18, 22
117	Taraxacum leucanthum (Ldb.)	Cop <sup>1</sup>	22
118	Taraxacum officinale Wigg	Cop <sup>1</sup>	21
<b>Note: Cop<sub>1</sub>: vegetation cover percentage is between 10-25%; Cop<sup>2-3</sup>: vegetation cover percentage is more 30%; Sol: vegetation cover percentage is between 1-5%</b>			

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## Appendix E Paleontological and Archeological Survey Fulfillment

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**INSTITUTE OF HISTORY  
AND ARCHAEOLOGY  
MONGOLIAN ACADEMY OF SCIENCES**

13343 Jucov street-77, Ulaanbaatar, MONGOLIA  
Tel: (976-11) 45 50 28, Fax: (976-11) 45 83 05,  
E-mail: info@history.mas.ac.mn

Date 04 July 2019  
Ref. 2/53

TO "BGM DISTRIBUTION" LLC

**Archaeological Survey Fulfillment**

Research fellows from Institute of History and Archaeology, Mongolian Academy of Sciences carried out an archaeological survey in the "Shuvuun fabrik" and "Bio kombinat" areas of "BGM Distribution" LLC since June 27 to 28, 2019.

There documented total 12 archaeological objects, 5 of them Bronze Age khirgisuur tombs and 7 Medieval period of burials.

These archaeological objects are the significant culture of Mongolian ancient history and the company have to preserve and protect these cultural objects during the activities or to request archaeological excavation if necessary. Also, there could be reveal archaeological sites under the soil, in case the company must have an obligation to inform to the professional organization of archaeology under the related regulations and law of Mongolia.

/Fieldwork report is attached/

SCIENTIFIC SECRETARY,  
Doctor., Prof. *N. Khishigt* N.KHISHIGT







"BGM DISTRIBUTION" LLC

**INSTITUTE OF ARCHAEOLOGY**  
**MONGOLIAN ACADEMY OF SCIENCES**

13343 Jucov street-77, Ulaanbaatar, MONGOLIA  
Tel: 45-28-94, Fax: (976-11) 45-28-99

Date 2020. 06. 10  
Ref. 01/138

**Archaeological Survey Fulfillment**

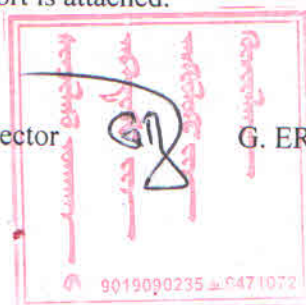
According to the paragraph 27 of chapter 5 in Cultural Heritage Protection Law of Mongolia, research fellows from Institute of Archaeology, Mongolian Academy of Sciences have carried out an archaeological survey in the licensed area of "BGM Distribution" LLC for advanced water purification planning square and along the 97 hectares square for connecting to the water supply system of pipes Administration of Drainage, Mongolia.

Total 4 archaeological objects documented by the field survey includes 2 grave and khirgisuur of Bronze Age and 2 Medieval Period of burials. These objects are located in 100-meter south from the planning area of water supply system.

These archaeological objects are the significant culture of Mongolian ancient history and the company have to preserve and protect these cultural objects during the activities or to request archaeological excavation if required. Also, there could be reveal archaeological sites under the soil during the process, in case the company must have an obligation to inform to the professional organization of archaeology under the related cultural regulations and law of Mongolia.

Fieldwork report is attached.

Acting Director



G. EREGZEN, Ph.D., Associate Professor



"BGM DISTRIBUTION" LLC

**INSTITUTE OF ARCHAEOLOGY**  
**MONGOLIAN ACADEMY OF SCIENCES**

13343 Jucov street-77, Ulaanbaatar, MONGOLIA  
Tel: 45-28-94, Fax: (976-11) 45-28-99

Date 2020. 05. 20  
Ref. 01/123

**Ethnographic Study Fulfillment**

According to the paragraph 27 of chapter 5 in Cultural Heritage Protection Law of Mongolia, research fellows from Institute of Archaeology, Mongolian Academy of Sciences have carried out an ethnographic study in the licensed area of "BGM Distribution" LLC, for advanced water purification planning square and along the 97 hectares square for connecting to the water supply system of pipes Administration of Drainage, Mongolia.

However, we have no hesitation to continue activities of your company in the frame of Cultural protection law in the licensed area during the point of ethnographic survey, but some public objects as Monument for Victims and the common road to Songinokhairkhan mountain offering site are subsisting, in case the company must have an obligation to protect pasture resource for traditional being of the Mongols.

We are appreciating full to your company for following archaeological, ethnographic and paleontological survey phases in the Mongolian Cultural Heritage Protection Law and we hope that the company will be paid an attention to protecting and preserving of Mongolian national land resource.

Acting Director



G. EREGZEN, Ph.D., Associate Professor



## RECOMMENDATION LETTER

**INSTITUTE OF  
PALEONTOLOGY AND GEOLOGY  
MONGOLIAN ACADEMY OF SCIENCES**

15160, P.O.B 46/650, S.Danzan street 3/1, Ulaanbaatar,  
MONGOLIA, Tel/Fax: (976-11) 32 58 35,  
E-mail: tsogtmondin@gmail.com

Date 2019. 07. 25

Ref. 7/29

Based on the Mongolian Law on Protection of Cultural Heritage (Article 27 and 38), Institute of Paleontology and Geology and BGM Distribution LLC have signed the contract to conduct paleontological resource assessment for the Water Supply and Distributing Pipeline Project in the western parts of the Songinokhairkhan and Khan-Uul districts, City of Ulaanbaatar, Mongolia.

Dr. Badamkhatan Zorigt has completed the paleontological investigation for the project area on July 19<sup>th</sup>, 2019. In the project area, major rock formations consist of Carboniferous siltstone and Quaternary sedimentary rocks. As a result of this study, no paleontological resources were found from the project area, at least in the macro level.

Since no paleontological resources were found, we have no reason to object the operation of this project. However, ancient vertebrate remains were previously reported from other parts of Tuul valley. In case of exposing fossils during grading and/or excavation operation, I kindly ask you to notify us (Institute of Paleontology and Geology) as soon as possible for mitigation measures.

DIRECTOR



TSOGTBAATAR KHISHIGJAV



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## Appendix F ESMP – CP-1: Production Well Drilling, Construction, Development, and Acceptance Testing

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This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-1: Production Well Drilling, Construction, Development, and Acceptance Testing of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>74</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

As discussed in Sections 3.2 and 5.2 of the BWSE environmental and social impact assessment (ESIA), the ESIA team eliminated decommissioning from detailed study. Because UB always will require water and therefore a bulk water system, effectively the useful life of the project will not end, and the system will not be decommissioned. Rather, when needed, the bulk water system will be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. Therefore, management measures are not specified for a decommissioning phase. Nonetheless, this ESMP presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities

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<sup>74</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight
- Estimated Costs – Costs of implementing the management measure and monitoring

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as Technical Specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.



## **Technical Specifications, Division 1 – General Requirements**

### **Section 01030, Special Requirements**

- Health and Safety Plan
- Product Handling
- Disposal of excess material
- Disposal of debris
- Preconstruction Video Recording of Entire Site
- Detours and Road Accessibility
- Permits, Fees and Bonds

### **Section 01046, Control of Work**

- Hours of Construction
- Open Excavations
- Occupying Private Land
- Interference with and Protection of Streets
- Care and Protection of Property
- Cleanup and Disposal of Excess Material

### **Section 01063, Miscellaneous Requirements**

- Traffic Control
- Interference with Existing Utilities
- Maintaining Flows

### **Section 01110, Environmental Protection Procedures**

- Prevention of Environmental Pollution
- Erosion Control
- Protection of Streams, Wetlands and Surface Water
- Protection of Land Resources
- Protection of Air Quality
- Noise Control

### **Section 01500, Temporary Facilities**

- Temporary Field Offices
- Internet Service
- Temporary Fence
- Potable Water
- Electricity
- Sanitary Conveniences
- Barricades and Guard Lights
- Temporary Heat
- Shelter and Protection of Materials
- Security

### **Section 01568, Erosion Control, Sedimentation & Containment of Construction Materials**

- Erosion Control

### **Section 01610, Delivery, Storage and Handling**

- Storage and Handling of Hazardous Materials

### **Section 01700, Contract Closeout**

- Final Cleaning

<b>Technical Specifications, Division 2 – Site Work</b>	
<p><b>Section 02210, Earth Excavation, Backfill, Fill and Grading</b></p> <ul style="list-style-type: none"> <li>○ Excavation</li> <li>○ Separation of Excavated Material for Reuse</li> <li>○ Trench Excavation</li> <li>○ Reuse and Disposal of Surplus Excavated Materials</li> <li>○ Care and Restoration of Property</li> <li>○ Backfilling</li> </ul> <p><b>Section 02230, Site Clearing</b></p> <ul style="list-style-type: none"> <li>○ Clearing and Grubbing</li> </ul> <p><b>Section 02672, Water Supply Well Construction, Development and Pumping Tests</b></p> <ul style="list-style-type: none"> <li>○ Generalized Water Supply Description</li> <li>○ Well Installation Plan</li> <li>○ Protection of Work and Property</li> <li>○ Clean-Up</li> <li>○ Protection of Existing Conditions</li> <li>○ Drilling Preparation</li> <li>○ Performance Pump Testing</li> <li>○ Final Disinfection</li> <li>○ Site Clean-Up</li> </ul>	

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule
- Implementation Budget

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and costs into a workplan, schedule, and budget estimate for implementing the ESMP.

## **F.1 Pre-Construction Phase**

### **F.1.1 Responsibilities During Pre-Construction**

## **MCA-Mongolia**

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST), led by a Social Manager, that during the pre-construction and construction phases, in coordination with the Contractor, will coordinate with community representatives and liaisons, and project affected persons in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

### **SST Organization and Staffing**

- Social Manager, with suitable experience in resettlement and management of social issues in construction, who will lead the team
- Two Social Safeguards Officers
  - One experienced in liaison with construction companies and familiar with workplace training/toolbox
  - One experienced in social and gender inclusion, who will manage coordination of the MCA-Mongolia Grievance Redress Mechanism (GRM)
- Two Community Liaison Officers who will work at the local level, one assigned to each of Khan-Uul District and Songinokhairkhan District

As needed, MCA-Mongolia or its representative must expand the SST size in relation to the increase in supervision and monitoring of contractors.

### **SST Responsibilities**

- Finalize, update, monitor, and report as required on BWSE social plans and those prepared by the Contractor:
  - Labor Management Plan
  - Gender Integration and Social Inclusion Plan
  - Counter-Trafficking in Persons Plan
  - Stakeholder Engagement Plan
  - Construction Camp and Temporary Facilities Management Plan
  - Cultural Heritage Training Plan
- Manage, update, and implement the Stakeholder Engagement Plan
- Plan and lead community consultation meetings
- Ensure the design and delivery of effective information campaigns using all media
- Liaise with the UB MUD regarding the land acquisition and compensation process in resettlement
- Undertake further enquiry among herders as to the pattern of grazing disruption caused by land take and land reclassification
- Liaise with khoroo administration and local communities to negotiate new grazing arrangements for both winter and summer grazing
- Manage and maintain the Grievance Matrix
- Liaise with MCA-Mongolia, MUD, and contractors to implement and assist in resolution of grievances
- Inform community members of employment opportunities
- Assist local people to apply for vacancies through the Ministry of Labor and Social Protection offices

- Liaise with contractors to encourage and promote local employment over imported labor and emphasize the contractual obligations to aim for 30 percent of unskilled and semi-skilled jobs to go to women
- Liaise with experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender-based violence, gender equity, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Monitor and supervise contractor compliance with designing and implementing social policies and plans, training, internal grievance systems, and the MCA-Mongolia GRM
- In cases of internal complaints of sexual harassment or gender based violence within the contractor's grievance mechanism, ensure that an independent investigator is appointed, at the expense of the contractor, to lead the investigation and reporting on the grievance
- Monitor achievement of resettlement and review completion, and recommend further measures if households fail to reinstate their livelihoods
- Finalize the Vulnerable People's Plan and ensure implementation through the Ministry of Labor and Social Protection

## Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by an acceptable CESMP, must be permitted in accordance with all applicable permitting requirements. The Contractor will need to negotiate with and potentially compensate landowners for temporary use of land. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of

project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of this ESMP.

The Contractor will designate an Environmental and Social Performance Manager as a key staff. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and relevant monitoring requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions proposed by the Contractor, as needed, to reflect field conditions with the approval of the Engineer.

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan (GSI)
- Counter-Trafficking in Persons Response Plan and Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety



requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored. The CESMP, at a minimum, shall include the following plans:

- Environmental Management Plan
- Waste Management Plan
- Social and Gender Inclusion Plan
- Health and Safety Management Plan
- Education, Training, and Community Outreach Plan
- Risk Control and Emergency Response Plan
- Monitoring and Verification, and Maintenance Actions Plan

### **Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site
- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring
- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian Law on Labor, Law on Promotion of Gender Equality and other relevant employment laws. Ensure each employee has a written contract and is made aware of and signs the Worker Code of Conduct, and ensure compliance with the Labor Management Plan

- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response
  - Waste Management
  - Labor Management
  - Gender Integration and Social Inclusion
  - Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
  - Stakeholder Engagement, Community Consultation, and Grievance Redress
  - Construction Camp and Temporary Facilities Management
  - Cultural Heritage Protection
  - Health and Safety Management

### ***Preparation of the Site-Specific CESMP***

The CESMP will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

### ***Management Acknowledgements***

#### **1) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Project Director attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

#### **2) Statutory Understanding and Compliance**

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

- a) All current environmental laws and regulations, related to, but not limited to, the following:
  - Noise
  - Vibration
  - Air pollution
  - Water contamination
  - Solid and hazardous waste disposal
  - Waste disposal
  - Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
  - Use of explosives;

- Protection of public traffic
  - Historical, cultural, and archaeological monuments/sites
  - Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.
- b) All current labor laws and laws related to, but not limited to, the following:
- Contract of employment and labor disputes
  - Working conditions
  - Management, monitoring, and supervision
  - Gender-based discrimination in employment
  - Child labor
  - Trafficking in persons
  - Gender-based violence
  - Sexual harassment
- c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

### 3) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

### 4) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included for implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

- a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans, documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.
- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

## **Organization and Staffing**

### 1) Organization Chart

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

### 2) Identification of Responsibilities

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager

appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

a) Environmental and Social Performance Manager

The Environmental and Social Performance Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Performance Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

b) Social and Gender Manager

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-

19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative's SST regarding the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with the MCA-Mongolia or its representative's SST over community contacts
- Liaise with the MCA-Mongolia or its representative's SST to implement and assist in resolution of grievances
- Inform the MCA-Mongolia or its representative's SST of employment vacancies and recruit through the Ministry of Labor offices and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project GRM; documenting, reporting, and taking part in finding solutions

3) Appointments



The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager
- Health and Safety Manager

The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

### **Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities

#### **1) Environmental, Social and Gender, and Health and Safety Reports**

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.

**Table 1 Summary of Reporting Requirements**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s).</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>

Report	Submission Schedule	Content
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period, grievances registered and resolved</li> <li>• Grievances registered and resolved</li> </ul>

## 2) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes:

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the contractor's organization require reporting to the MCA-Mongolia or its representative. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combating Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction."

## 3) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.

- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### **Environmental, Social and Gender, and Health and Safety Provisions**

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## **F.1.2 Environmental Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **F.1.3 Waste Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **F.1.4 Social and Gender Inclusion**

### **Management Measure Wells - 1: Labor Management**

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> </ul>



<ul style="list-style-type: none"> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> <li>- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.</li> <li>- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.</li> </ul> </li> </ul>

- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
- Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
  - Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
    - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
  - Ministry of Labor and Social Welfare Order (2016)
    - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
  - International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth, and disadvantaged groups; 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force

- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a worker's grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.

- In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, and secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation and abuse, and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager



### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the Conditions of Contract, as well as the MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan
  - The MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

MCA-Mongolia or its representative:

- Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor
- Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups
- Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms

Contractor:

- Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)
- Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities
- Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process

#### LOCATIONS:

All construction sites and temporary construction facilities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Required plans written, approved, and implemented
- Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker
- Use of written contracts with defined pay scales by employment activity
- Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers
- Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia
- Percent of all employees that are women, disaggregated by skill/occupational level

<ul style="list-style-type: none"> <li>Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor , such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships Internments established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>100% of employees and sub-contractors sign the Worker Code of Conduct</li> </ul> </li> <li>Resolution of 100% of internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p>	<p><b>MONITORING:</b></p>

<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative
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## Management Measure Wells - 2: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP)             <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy             <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1             <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2             <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia             <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality             <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor             <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> </ul> </li> </ul>

- Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction

## OBJECTIVES

The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.

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- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level
- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impact of the BWSE project on the project affected communities

## MANAGEMENT MEASURE

### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

#### *Community Engagement*

- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains
  - Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
  - Zero-tolerance of gender-based violence
  - Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan

#### *Expanding Short-term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques

- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

#### *Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### MONITORING

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities
- Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Employment recruitment activities
- Employment records of workers
- Number, dates, and locations of community engagement meetings
- Community related grievance redress actions and outcomes



- Number of purchase orders signed each year with UB businesses, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders

**Success Criteria:**

- 100% of required community meetings are held, with all topics covered
- Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category
- Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Apprenticeships and internships established and completed for each construction season
- Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan
- Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)
  - Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.

**REPORTING:**

- Reports on Gender Integration and Social Inclusion to be included in project monthly reports
- Summarize Gender Integration and Social Inclusion activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**MONITORING:**

*Implementation:*

- Update recording of GSI activities and grievance redress actions as they occur

*Reporting:*

- Monthly in CESMP update

**RESPONSIBILITY**

**MANAGEMENT MEASURE:**

*Implementation:* Contractor  
*Oversight:* Engineer

**MONITORING:**

*Implementation:* Contractor  
*Reporting:* Contractor  
*Oversight:* Engineer

### Management Measure Wells - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, “Trafficking in Persons” means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”</li> <li>○ Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”</li> <li>○ Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
MANAGEMENT MEASURE
<p><b>Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment</b></p>

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged

incident of gender-based violence

- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be

communicated in Mongolian, in whole, to project-affected khoroo and District governments.
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p>



### *Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

### *Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

### *Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

### **REPORTING:**

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports
- Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

### **SCHEDULE**

#### **MANAGEMENT MEASURE:**

*Implementation:*

#### **MONITORING:**

*Implementation:*

<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

## F.1.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## F.1.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure Wells - 1: Labor Management
- Management Measure Wells - 2: Gender Integration and Social Inclusion (GSI)
- Management Measure Wells - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure Wells - 4: Stakeholder Engagement, Community Consultation, and Grievance Redress

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>IFC Performance Standard 1</li> </ul>

- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities
- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.

#### OBJECTIVES

- Inform and involve all stakeholders
- Have in place a defined policy for dealing with external parties
- Foster positive relations and effective partnerships with local communities throughout project construction and operation
- Maximize the beneficial impact of the BWSE project on the affected communities

#### MANAGEMENT MEASURE

##### Stakeholder Engagement, Community Consultation, and Grievance Redress

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

##### Stakeholder Engagement

- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirements described in Annex B of this ESMP
- At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify:
  - Contractor's responsibilities and participation in community consultation, specifying:
    - A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities
    - How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
    - How information is to be shared with the communities and other project partners
    - Protocols for conducting, recording, and disseminating the results of community consultation
  - Contractor's responsibilities and participation in the project Grievance Redress Mechanism, specifying how the Contractor will:
    - Take action to resolve low level grievances
    - Ensure all employees are trained to understand their role in the project Grievance Redress Mechanism
    - Participate in higher tier grievance resolution
    - Participation in the overall monitoring and evaluation of the project
- The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of this ESMP.

##### Community Consultation

- The MCA-Mongolia or its representatives will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with the MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation
  - Actively promote awareness and disclose information in affected communities on the following

<ul style="list-style-type: none"> <li>○ Purpose, nature, and scale of the project</li> <li>○ Duration of proposed project activities</li> <li>- Record results of Contractor's community consultation activities</li> <li>- Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul>	
<b>Grievance Redress</b> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will: <ul style="list-style-type: none"> <li>- Supervise, and monitor participation by all parties</li> </ul> </li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>- Develop and implement the Grievance Redress Mechanism consistent with Annex A of this ESMP.</li> <li>- Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism</li> <li>- Document all grievance redress actions</li> <li>- Report on the Grievance Redress Mechanism to the Engineer</li> </ul> </li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities and project affected communities	
<b>MONITORING</b>	
<b>MCA-Mongolia or its representative</b> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul>	
<b>Contractor</b> <ul style="list-style-type: none"> <li>• Document all Contractor's stakeholder engagement and consultation activities</li> <li>• Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities and project affected communities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<b>Indicators:</b> <ul style="list-style-type: none"> <li>• Number, content, and outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> <li>○ Grievance redress actions</li> </ul> </li> </ul>	
<b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> </ul> </li> <li>• Resolution of grievances</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i>	<b>MONITORING:</b> <i>Implementation:</i>

<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### F.1.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

### F.1.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In



coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## F.2 Construction Phase

### F.2.1 Responsibilities During Construction

#### MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) to coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards, and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## F.2.2 Environmental Management

### Management Measure Wells - 5: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>- Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>- Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>- Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>- Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Mongolian Law on Labor Safety and Hygiene</li> <li>- Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> <li>• Mongolian Criminal Code</li> <li>- Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> <li>• IFC Performance Standards 1, 3, and 4</li> <li>- Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning</li> <li>- Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Emergency Preparedness and Response</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer’s written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul> <p><b>Hazardous Materials Management</b></p> <ul style="list-style-type: none"> <li>• Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials</li> <li>• Develop prioritized material-specific handling procedures and training requirements as necessary according to risk</li> <li>• Assign an officer to manage and advise on hazardous materials management</li> </ul> <p><i>Handling</i></p> <ul style="list-style-type: none"> <li>• Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient</li> <li>• Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities</li> <li>• Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)</li> <li>• Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells</li> </ul> <p><i>Transport</i></p> <ul style="list-style-type: none"> <li>• Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials</li> </ul>

- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations.

#### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

#### **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

#### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.
- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.

- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

### **Emergency Preparedness and Response Plan**

- Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan



<ul style="list-style-type: none"> <li>- Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan</li> <li>- Specifies: <ul style="list-style-type: none"> <li>o Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment</li> <li>o Potential emergencies and key areas prone to emergency situations</li> <li>o Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.</li> <li>o Actions to be taken prior to an emergency—i.e., preventive and preparatory measures</li> <li>o Actions to be taken during an emergency—i.e., response measures</li> <li>o Actions to be taken after an emergency—i.e., recovery and assessment measures</li> <li>o Contact lists for emergency situations</li> <li>o Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas</li> </ul> </li> <li>- Assigns roles and responsibilities for emergency preparedness and response</li> <li>• Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities</li> <li>• In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof.</li> </ul>	
LOCATIONS:	
All construction sites and temporary construction facilities	
<b>MONITORING</b>	
Document submission and approval of plan	
LOCATIONS:	
All construction sites and temporary construction facilities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i>	<i>Implementation:</i>
<ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul>
	<i>Reporting:</i>

	<ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## F.2.3 Waste Management

### Management Measure Wells - 6: Waste Management

<b>POTENTIAL IMPACT</b>
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hazardous and Toxic Chemicals               <ul style="list-style-type: none"> <li>- Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>• Mongolian Law on Sanitation               <ul style="list-style-type: none"> <li>- Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>• Mongolian Law on Waste               <ul style="list-style-type: none"> <li>- Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> <li>• Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste</li> <li>• Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).</li> <li>• Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes               <ul style="list-style-type: none"> <li>- Requires providing personal protective equipment to the organization's waste management officer.</li> </ul> </li> <li>• Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste               <ul style="list-style-type: none"> <li>- Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).</li> </ul> </li> <li>• IFC Performance Standards 3 and 4               <ul style="list-style-type: none"> <li>- Encourages recovering and reusing waste in a manner that is safe for human health and the environment.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning               <ul style="list-style-type: none"> <li>- Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Waste Management</b>

The Contractor will:

- Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements:
  - Paragraph 1.04.E Hazardous Waste Management Plan
  - Paragraph 1.14 Disposal of Excess Material
  - Paragraph 1.21 Disposal of Debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures:
  - Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner
  - Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 150%-capacity secondary containment for fluids stored in drums and buckets or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste

- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor's site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer's written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Assigns roles and responsibilities for waste management
- Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available

#### LOCATIONS:

All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of

#### MONITORING

##### Document:

- Provision, maintenance, and/or updating of:
  - MSDSs
  - Secondary containment capacity for all storage of liquid hazardous materials
  - Tanks and sumps inspection records
  - Spill kits
  - First aid
  - Waste inventory
  - Waste management training
- Submission and approval of site-specific Waste Management Plan

#### LOCATIONS:

All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of

#### INDICATORS AND SUCCESS CRITERIA:

##### Indicators:

- Submission of site-specific Waste Management Plan
- Volumes of waste generated
- Volumes of waste sent for off-site recycling
- Number of reported non-compliances with the controls identified in the plan
- Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment

<ul style="list-style-type: none"> <li>• Number of reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Approval of site-specific Waste Management Plan</li> <li>• Minimize volume of waste generated</li> <li>• Maximize volume of waste sent for off-site recycling</li> <li>• Zero: <ul style="list-style-type: none"> <li>○ Reported non-compliances with the controls identified in the plan</li> <li>○ Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>○ Reported waste incidents</li> <li>○ Number of waste related community complaints</li> <li>○ Instances of off-site contamination identified</li> </ul> </li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>• Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Management measure and plan implementation throughout construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## F.2.4 Social and Gender Inclusion

### Management Measure Wells - 7: Labor Management

<p><b>POTENTIAL IMPACT</b></p> <p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> </ul>
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<ul style="list-style-type: none"> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2</li> </ul>

- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
- Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
  - Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
  - Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
  - International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level

- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative's Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth, and disadvantaged groups; 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process

- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a worker's grievance redress procedure that:

- Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
- Guarantees confidentiality to makers of allegations
- Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
- Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
- Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on "Prohibition of Sexual Harassment"
- The Contractor shall note the contract clause on "Facilities for Staff and Labor" and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, and secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to "adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds" per the contract clause on "Engagement of Staff and Labor," the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation and abuse, and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:



<ul style="list-style-type: none"> <li>○ All employees must attend at the commencement of employment and over the employment period twice yearly</li> <li>○ Incorporate toolbox talks that include reinforcement of all training programs</li> <li>• Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST</li> <li>• Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues <ul style="list-style-type: none"> <li>○ These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager</li> </ul> </li> </ul> <p><i>Site-specific Labor Management Plan</i></p> <p>The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct</li> <li>• Is consistent and compliant with: <ul style="list-style-type: none"> <li>○ Mongolian Law on Labor</li> <li>○ Relevant aspects of the Conditions of Contract, as well as the MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>○ The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>• Assigns roles and responsibilities for labor management</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
INDICATORS AND SUCCESS CRITERIA:

**Indicators:**

- Required plans written, approved, and implemented
- Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker
- Use of written contracts with defined pay scales by employment activity
- Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers
- Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia
- Percent of all employees that are women, disaggregated by skill/occupational level
- Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics
- Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes

**Success Criteria:**

- Successful outcome of:
  - 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents
  - Zero tolerance of child labor – no child labor on site or with any contract activity
  - Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected
  - Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category
  - Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Apprenticeships and internships Internments established and completed for each construction season
  - All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan
  - 100% of employees and sub-contractors sign the Worker Code of Conduct
- Resolution of 100% of internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)

**REPORTING:**

- Report communications and written approval of Engineer of site-specific Labor Management Plan
- Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan
- Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

**MONITORING:**

*Implementation:*

<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### Management Measure Wells - 8: Gender Integration and Social Inclusion (GSI)

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> </ul>

- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
- Constitution of Mongolia
  - Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.
- Mongolian Law on Gender Equality
  - Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.
- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction

#### OBJECTIVES

The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.

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- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level
- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impact of the BWSE project on the project affected communities

#### MANAGEMENT MEASURE

##### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

##### *Community Engagement*

- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains

- Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
- Zero-tolerance of gender-based violence
- Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan

*Expanding Short-term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

*Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

**LOCATIONS:**

All construction sites and temporary construction facilities and project affected communities

**MONITORING**

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities



<ul style="list-style-type: none"> <li>Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>	
LOCATIONS:	
All construction sites and temporary construction facilities and project affected communities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>Employment recruitment activities</li> <li>Employment records of workers</li> <li>Number, dates, and locations of community engagement meetings</li> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.</li> </ul> </li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i>	<i>Implementation:</i>

<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> Engineer</p>

### Management Measure Wells - 9: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>

- To prevent incidence of trafficking of persons for sex by project employees
- To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites
- To prevent sexual harassment at all construction sites and temporary construction facilities
- To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace
- To prevent incidences of gender-based violence involving workers

## MANAGEMENT MEASURE

### Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).

- C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
- Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual

<p>Harassment.</p> <ul style="list-style-type: none"> <li>○ Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.</li> <li>○ Training shall address <ul style="list-style-type: none"> <li>▪ Attitudes to and prevention of sexual harassment in the workplace</li> <li>▪ Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons</li> <li>▪ Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> </ul> </li> <li>• Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> </ul>



- Number and content of trainings for all staff
- Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location
- Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons
- Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints
- Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training

**Success Criteria:**

*Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

*Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

*Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

### Management Measure Wells - 10: Construction Camp and Temporary Facilities Management

<b>POTENTIAL IMPACT</b>
Risks and impacts that may be associated with workers' accommodation and workplace conditions
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Constitution of Mongolia             <ul style="list-style-type: none"> <li>- Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code             <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.</li> </ul> </li> <li>• Mongolian Labor Code             <ul style="list-style-type: none"> <li>- Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene             <ul style="list-style-type: none"> <li>- Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.</li> </ul> </li> <li>• Mongolian Law of Fire Safety             <ul style="list-style-type: none"> <li>- Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.</li> </ul> </li> <li>• Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33             <ul style="list-style-type: none"> <li>- Prohibits precluding to conclude a contract of legal entities and organizations.</li> </ul> </li> <li>• IFC Performance Standards 2 and 4             <ul style="list-style-type: none"> <li>- Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking             <ul style="list-style-type: none"> <li>- Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• IFC and EBRD (2009) guidance at <i>Workers' Accommodation: Processes and Standards</i><sup>1</sup></li> <li>- Requires having a written management plan on worker camps and housing facilities.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning</li> <li>- Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Construction Camp and Temporary Facilities Management</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment</li> <li>• Ensure compliance with IFC and EBRD (2009) guidance at <i>Workers' Accommodation: Processes and Standard</i> for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.</li> <li>• Ensure compliance with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i> for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.</li> <li>• Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i></li> <li>• Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality</li> <li>• Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work</li> <li>• Provide all accommodation sites with sufficient supplies and services</li> <li>• Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition</li> <li>• Conduct visual checks on site to ensure proper housekeeping</li> <li>• Ensure suitable first aid equipment is kept on site, at various appropriate locations</li> <li>• Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required</li> <li>• Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies</li> <li>• Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on: <ul style="list-style-type: none"> <li>- Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>- General waste management, housekeeping, first aid practices, and communicable diseases</li> </ul> </li> <li>• Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>- Assigns roles and responsibilities for construction camp and temporary facilities management</li> </ul> </li> </ul>

<b>LOCATIONS:</b>	
All areas within and immediately surrounding construction camps and other temporary facilities	
<b>MONITORING</b>	
Document: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training</li> <li>• Submission and approval of plan</li> </ul>	
<b>LOCATIONS:</b>	
All areas within and immediately surrounding construction camps and other temporary facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
Indicators: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training sessions</li> <li>• Submission of plan</li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>• Plan approval</li> <li>• Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and annually thereafter</li> <li>• Implementation of above provisions throughout construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training</li> <li>• Document implementation of above provisions</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure Wells - 11: Cultural Heritage Protection

<b>POTENTIAL IMPACT</b>
<ul style="list-style-type: none"> <li>• Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> </ul>

<ul style="list-style-type: none"> <li>• Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> <li>• Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Protection of Cultural Heritage <ul style="list-style-type: none"> <li>- If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>- Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protection the intangible cultural heritage.</li> </ul> </li> <li>• IFC Performance Standard 8 <ul style="list-style-type: none"> <li>- Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> <li>- Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.</li> </ul> </li> </ul>
<p><b>OBJECTIVES</b></p> <ul style="list-style-type: none"> <li>• Protect tangible cultural heritage from inadvertent excavation or damage</li> <li>• Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p> <p><b>Cultural Heritage Protection</b></p> <p><b>Chance Find Procedure</b></p> <p>As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.</p> <p>Should any unexpected tangible cultural heritage be discovered:</p> <ul style="list-style-type: none"> <li>• Cease all work in the immediate area and do not disturb the chance find further, including: <ul style="list-style-type: none"> <li>- Establishing a 30-meter buffer around the chance find</li> <li>- Leaving buffer undisturbed until competent cultural heritage specialist assesses the site</li> <li>- Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.</li> </ul> </li> <li>• Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area</li> <li>• Immediately notify the Engineer and the concerned government agencies, specifically the: <ul style="list-style-type: none"> <li>- Office of the governor of the capital city</li> <li>- Office of governor of the respective Khan-Uul District or Songinokhairkhan District</li> <li>- Local police</li> <li>- Institute of Archeology, Mongolian Academy of Sciences</li> <li>- Institute of History and Ethnography, Mongolian Academy of Sciences</li> </ul> </li> <li>• Provide the following information to the Engineer and government agencies: <ul style="list-style-type: none"> <li>- Cultural heritage site type—description and photograph(s)</li> <li>- Location—description and GPS coordinates</li> <li>- Date, time, and details of find</li> <li>- Nature of work that led to exposure of or locating the find</li> </ul> </li> <li>• Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation</li> <li>• Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage</li> </ul>



- Restart work only upon written direction from the Engineer

### **Cultural and Sacred Landscape and Places**

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

### **Training**

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

- Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum:
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities
  - Assigns roles and responsibilities for training
- Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.

#### **LOCATIONS:**

- All work sites
- Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred

### **MONITORING**

Monitor throughout construction

#### *Chance Find Procedure*

- Construction work sites during excavation or other ground disturbance

#### *Cultural and Sacred Landscape and Places*

- Communications SST Community Liaison Officers and MCA-Mongolia or its representative
- Written directions of Engineer
- Actions to accommodate spiritual, religious, and traditional ceremonies and rituals
- Performance of spiritual, religious, and traditional ceremonies and rituals

#### *Training*

- Document submission and approval of training plan
- Document training of personnel as specified in approved plan

#### **LOCATIONS:**

- All work sites

#### **INDICATORS AND SUCCESS CRITERIA:**

Indicators:

#### *Chance Find Procedure*

- Chance find of tangible cultural heritage
- Excavation or damage of tangible cultural heritage
- Cease work decision

<ul style="list-style-type: none"> <li>Protection of chance find area and tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Submission of training plan</li> <li>Date and location of training sessions, or as specified in approved plan</li> <li>Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Training plan approval</li> <li>All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>	
<p><b>REPORTING:</b></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>Report chance find and cease work decision</li> <li>Report excavation or damage of tangible cultural heritage</li> <li>Report actions to protect chance find area and tangible cultural heritage</li> <li>Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Report communications with SST Community Liaison Officers and Engineer</li> <li>Report directions of Engineer</li> <li>Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> <li>Continuous during excavation or other ground disturbance</li> </ul> <p>Cultural and Sacred Landscape and Places</p> <ul style="list-style-type: none"> <li>As required, periodically throughout project construction</li> </ul> <p>Training</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>Document communications with SST Community Liaison Officers and the</li> </ul>

<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Personnel training in accordance with timing and frequency specified in approved plan; at minimum, once at beginning of each construction season</li> </ul>	<p>Engineer, and written directions of Engineer as they occur</p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training sessions and personnel start, training, and field deployment as they occur, or as specified in approved plan</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## F.2.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure Wells - 5: Emergency Preparedness and Response
- Management Measure Wells - 6: Waste Management
- Management Measure Wells – 8: Gender Integration and Social Inclusion (GSI)
- Management Measure Wells – 9: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Wells – 10: Construction Camp and Temporary Facilities Management

### Management Measure Wells - 12: Health and Safety Management

<b>POTENTIAL IMPACT</b>
Health and safety risks and impacts on work sites and in construction camps, and in the community
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>Mongolian Law on Waste <ul style="list-style-type: none"> <li>Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>IFC Performance Standard 4 <ul style="list-style-type: none"> <li>Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> </ul>

- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
  - Provides guidance on occupational health and safety and community health and safety.

#### OBJECTIVES

- Identify, assess, manage, and record and communicate all health and safety hazards, and ensure:
  - Resulting risks to people, property, assets, and the environment are evaluated
  - Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical
  - Any requirements to mitigate risks are implemented
  - Risks and actions to manage them are reported and communicated

#### MANAGEMENT MEASURE

##### Health and Safety Management

The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.

The Contractor will:

- Fully comply with the requirements of this management measure
- Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup>
- Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to:
  - Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan
  - Section 01046 Control of Work, Paragraph 3.05 Open Excavations
  - Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets
  - Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control
  - Protect drinking water sources, whether public or private, at all times
- Prepare and implement a traffic control plan for accessing the site, approved by Engineer
- Implement all reasonable precautions to protect the health and safety of workers
- Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers
- Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities
- Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident
- Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities
- Avoid or minimize traffic accidents and promote traffic safety by all project personnel
- Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials
- Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures
- Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice
- Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this

<p>management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter</p> <p>The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project</li> <li>• Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply</li> <li>• Specifies: <ul style="list-style-type: none"> <li>- Site security, including securing of excavations, hazardous materials, etc.</li> <li>- Confined space safety procedures</li> <li>- Excavation and trenching safety measures</li> <li>- First aid facilities, equipment, and materials</li> <li>- Protective clothing and safety equipment</li> <li>- HIV/AIDS awareness program</li> <li>- Covid-19 awareness program</li> <li>- Counter-trafficking in persons program</li> <li>- Health and Safety management monitoring and reporting</li> </ul> </li> <li>• Assigns roles and responsibilities for health and safety management</li> </ul>	
<p><b>LOCATIONS:</b></p> <p>All project sites and surrounding communities</p>	
<p><b>MONITORING</b></p>	
<p>Document submission and approval of plan</p>	
<p><b>LOCATIONS:</b></p> <p>All project sites and surrounding communities</p>	
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Submission of plan</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p>



<i>Oversight:</i> MCA-Mongolia or its representative	<i>Oversight:</i> MCA-Mongolia or its representative
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<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## F.2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure Wells - 5: Emergency Preparedness and Response
- Management Measure Wells - 6: Waste Management
- Management Measure Wells - 7: Labor Management
- Management Measure Wells - 8: Gender Integration and Social Inclusion (GSI)
- Management Measure Wells - 9: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Wells – 10: Construction Camp and Temporary Facilities Management
- Management Measure Wells - 11: Cultural Heritage Protection
- Management Measure Wells - 12: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure Wells - 13: Stakeholder Engagement, Community Consultation, and Grievance Redress

POTENTIAL IMPACT
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>

OBJECTIVES
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
MANAGEMENT MEASURE
<p><b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b></p> <p>The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.</p> <p><b>Stakeholder Engagement</b></p> <ul style="list-style-type: none"> <li>• The Contractor will: <ul style="list-style-type: none"> <li>➤ Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework</li> <li>➤ Maintain, revise, and update the project Stakeholder Engagement Matrix</li> <li>➤ Document all stakeholder engagement activities in the Stakeholder Engagement Matrix:</li> </ul> </li> </ul> <p><b>Community Consultation</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will <ul style="list-style-type: none"> <li>- Introduce Contractor's officers to communities</li> <li>- Monitor and supervise Contractor contacts with communities and other stakeholders</li> <li>- Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted</li> </ul> </li> <li>• In coordination with the MCA-Mongolia or its representative, the Contractor will <ul style="list-style-type: none"> <li>➤ Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the MCA- Mongolia Grievance Redress Mechanism, and other issues that arise during consultation</li> <li>➤ Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul> </li> </ul> <p><b>Grievance Redress</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will supervise, and monitor participation by all parties</li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>- Implement the Grievance Redress Mechanism consistent with Annex A of this ESMP</li> <li>- Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism</li> <li>- Document all grievance redress actions in the Stakeholder Engagement Matrix</li> <li>- Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer</li> </ul> </li> </ul>
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities</p>
MONITORING
<p><b>MCA-Mongolia or its representative</b></p> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul> <p><b>Contractor</b></p>

<ul style="list-style-type: none"> <li>Document all stakeholder engagement activities</li> <li>Document all community consultation activities</li> <li>Record results of Contractor's community consultation activities</li> <li>Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b> <b>Indicators:</b> <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> </ul> </li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## F.2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## **F.2.8 Monitoring and Verification, and Maintenance Actions**

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## **F.3 Implementation Work Plan and Schedule**

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.

## **F.4 Implementation Budget**

Implementation, including monitoring, of the ESMP management measures do not entail a marginal cost. Costs are reflected in MCA-Mongolia or its representative's operating costs, the Contractor's construction contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The cost of obtaining all required permits are deemed to be included in the Contractor's contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The costs of implementing ESMP management measures are primarily driven by staff costs. Other costs are associated with development of policies and plans, training, and equipment.

### MCA-Mongolia or Its Representative's Costs

Staff Costs				
Role	Cost	Unit	Total	Assumption
Environmental and Social Manager	\$1,500.00	salary	\$90,000.00	3.0 million MNT/month + benefits for 5 years
Waste Management Manager	\$1,500.00	salary	\$90,000.00	3.0 million MNT/month + benefits for 5 years
HSE Manager	\$1,500.00	salary	\$90,000.00	3.0 million MNT/month + benefits for 5 years
Social Manager	\$1,500.00	salary	\$90,000.00	3.0 million MNT/month + benefits for 5 years
Social Safeguards Officers	\$1,000.00	salary	\$120,000.00	2.0 million MNT/month + benefits for 2 officers for 5 years
Community Liaison Officers	\$1,000.00	salary	\$120,000.00	2.0 million MNT/month + benefits for 2 officers for 5 years
Staff Costs Total			<b>\$ 600,000.00</b>	

### Contractor Costs

CP-1 Staffing Requirements			
Total staff on CP-1 contract	50	staff	Assumed
HR Team	2	staff	Manager + 1 HR staff/50 employees
HSE Team	2	staff	Manager + 1 HSE staff/50 employees
Social Safeguards Officer	1	staff	1 officer for CP-1
Construction Camp Management Team	2	staff	Manager + 1 support staff/100 employees
Expected duration of Construction	14	months	Estimated

ESMP Management Measures Cost Estimate:

Staff Costs				
Role	Cost	Unit	Total	Assumption
HR Manager	\$ 2,000.00	salary	\$ 28,000.00	5.0 million MNT/month + benefits
HR staff	\$ 1,000.00	salary	\$ 14,000.00	2.5 million MNT/month + benefits



<b>HSE Manager</b>	\$ 2,000.00	salary	\$ 28,000.00	5.0 million MNT/month + benefits
<b>HSE staff</b>	\$ 1,000.00	salary	\$ 14,000.00	2.5 million MNT/month + benefits
<b>Social Safeguards Officer</b>	\$ 1,000.00	salary	\$ 14,000.00	2.5 million MNT/month + benefits
<b>Construction Camp Manager</b>	\$ 2,000.00	salary	\$ 28,000.00	5.0 million MNT/month + benefits
<b>Construction Camp Management Team</b>	\$ 1,000.00	salary	\$ 14,000.00	2.5 million MNT/month + benefits
<b>Staff Costs Subtotal</b>			<b>\$ 140,000.00</b>	
<b>Cost of HR Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 4,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 600.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 700.00	1 per HR staff per month
Vehicles	\$ 100.00	per day	\$ -	no project vehicles for HR staff (office job)
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 3,500.00	stationary and petty expenses per month
HR Office Costs Subtotal			\$ 9,800.00	
<b>Cost of HSE Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 4,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 600.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 700.00	1 per HR staff per month
Vehicles	\$ 100.00	per day	\$ 42,000.00	1 project vehicle per 2 HSE staff, leased @ \$100/day
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 3,500.00	stationary and petty expenses per month
PPE for visitors and spares	\$ 100.00	per set	\$ 3,000.00	20 sets for visitors + enough for 20% of staff requirements as spares.
HR Office Costs Subtotal			\$ 54,800.00	
<b>Cost of SSO Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 2,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 300.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 350.00	1 per HR staff per month
Vehicles	\$ 100.00	per day	\$ 42,000.00	1 project vehicle per SSO, daily @ \$100/day

Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 3,500.00	stationary and petty expenses per month
Regular Community Liaison	\$ 60.00	per day	\$ 4,200.00	Stakeholder and community liaison 5 days per month
Community Town Hall and Training	\$ 500.00	per day	\$ 7,000.00	once per month (in suitable venue with refreshments)
HR Office Costs Subtotal			\$ 53,350.00	
<b>Plan and Policy Development Costs</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Labor Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR Expert, 5 days @ \$500/day
Gender Integration and Social Inclusion Plan	\$ 2,500.00	each	\$ 2,500.00	GSI Expert, 5 days @ \$500/day
CTIP Plan	\$ 1,000.00	each	\$ 1,000.00	Expert, 2 days @ \$500/day
Code of Conduct	\$ 2,500.00	each	\$ 2,500.00	Psychologist/HR expert, 5 days @ \$500/day
Stakeholder Engagement Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Grievance Redress Mechanism (GRM)	\$ 2,000.00	each	\$ 2,000.00	Expert, 4 days @ \$500/day
Health and Safety Management Plan	\$ 2,500.00	each	\$ 2,500.00	HSE Expert, 5 days @ \$500/day
Covid-19 Prevention Plan	\$ 500.00	each	\$ 500.00	Expert, 1 days @ \$500/day
Emergency Preparedness and Response Plan	\$ 1,000.00	each	\$ 1,000.00	HSE Expert, 2 days @ \$500/day
Waste Management Plan (WMP)	\$ 1,000.00	each	\$ 1,000.00	Expert for 2 days @ \$500/day
Construction Camp and Temporary Facilities Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR/HSE Experts, 5 days @ \$500/day
Training Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Plan and Policy Development Costs Subtotal			\$ 23,000.00	
<b>Training Costs</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
HR Policy Training	\$ 500.00	coach/day	\$ 2,000.00	2 day course for HR staff once a year @ \$500/day
Code of Conduct Training	\$ 500.00	coach/day	\$ 5,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Staff Training	\$ 500.00	coach/day	\$ 2,000.00	2 day course for HSE staff once a year @ \$500/day

HSE Training	\$ 500.00	coach/day	\$ 5,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Orientation for visitors	\$ -	as necessary	\$ -	Included of HSE staff duties
First Aid training	\$ 500.00	coach/day	\$ 500.00	1 training per year for first aid volunteer staff (~10% of staff), full day, groups of ten max. (\$500/day for coach)
Emergency Preparedness and Response Training - HSE Staff	\$ 500.00	coach/day	\$ 1,000.00	1 day course for HSE staff once a year @ \$500/day
Emergency Preparedness and Response Training - all staff	\$ -	per employee	\$ -	Included in HSE training
ESMP Implementation Training Plan	\$ -	per employee	\$ -	Included in HSE training
WMP Training	\$ -	per employee	\$ -	Included in HSE training
Tangible Cultural Heritage Protection Training	\$ -	per employee	\$ -	Included in HSE training
Biodiversity Training	\$ -	per employee	\$ -	Included in HSE training
CTIP Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
CTIP Orientation for subcontractors and service providers	\$ -	per employee	\$ -	Included in HSE Orientation
Anti-Sexual Harassment and Discrimination Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
On-job training, apprenticeships, internships	\$ -	as required	\$ -	Included in staff costs (as per Labor Management Plan)
Community training in HSE, CTIP	\$ -	as required	\$ -	Included in Community Liaison (SSO )
Training Costs subtotal			\$ 15,500.00	
<b>Equipment and Other Costs</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
PPE equipment (hard hat, boots, hi-vis clothing, glasses, gloves)	\$ 100.00	per employee	\$ 10,000.00	PPE provided to all employees each year

First aid kits	\$ 100.00	each	\$ 500.00	1 kit per 10 employees
Emergency Response Plan Dissemination	\$ 2,500.00	overall	\$ 2,500.00	Posters, brochures, etc. at site/ camp indicating emergency procedures and phone numbers
Spill protection equipment	\$ 2,500.00	overall	\$ 2,500.00	Spill sheets for all vehicles, regularly changed.
GRM implementation	\$ -	per year	\$ -	Implementation of the GRM by HR staff/Social Safeguards Officer
Contract with Landfill for inert waste	\$ -	per year	\$ -	Covered in cost of construction operations
Contract with Hazardous waste company	\$ -	per year	\$ -	Covered in cost of construction operations
Bins at construction camp	\$ -	each	\$ -	Covered in cost of construction camp
Cultural Heritage - protection of known sites	\$ -	each	\$ -	Covered in cost of construction operations
Cultural Heritage - chance find	\$ 6,000.00	each	\$ -	Assume zero chance find in wellfields while drilling - most work in floodplain that is not archaeologically relevant.
Equipment and Other Costs Subtotal			\$ 15,500.00	
<b>ESMP Management Measures Costs Total</b>			<b>\$ 311,950.00</b>	

## F. Annex A – Grievance Resolution Mechanism

The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>75</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

1. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
2. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>76</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>77</sup> References available upon request to MCA.

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<sup>75</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>76</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>77</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017

The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.



- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

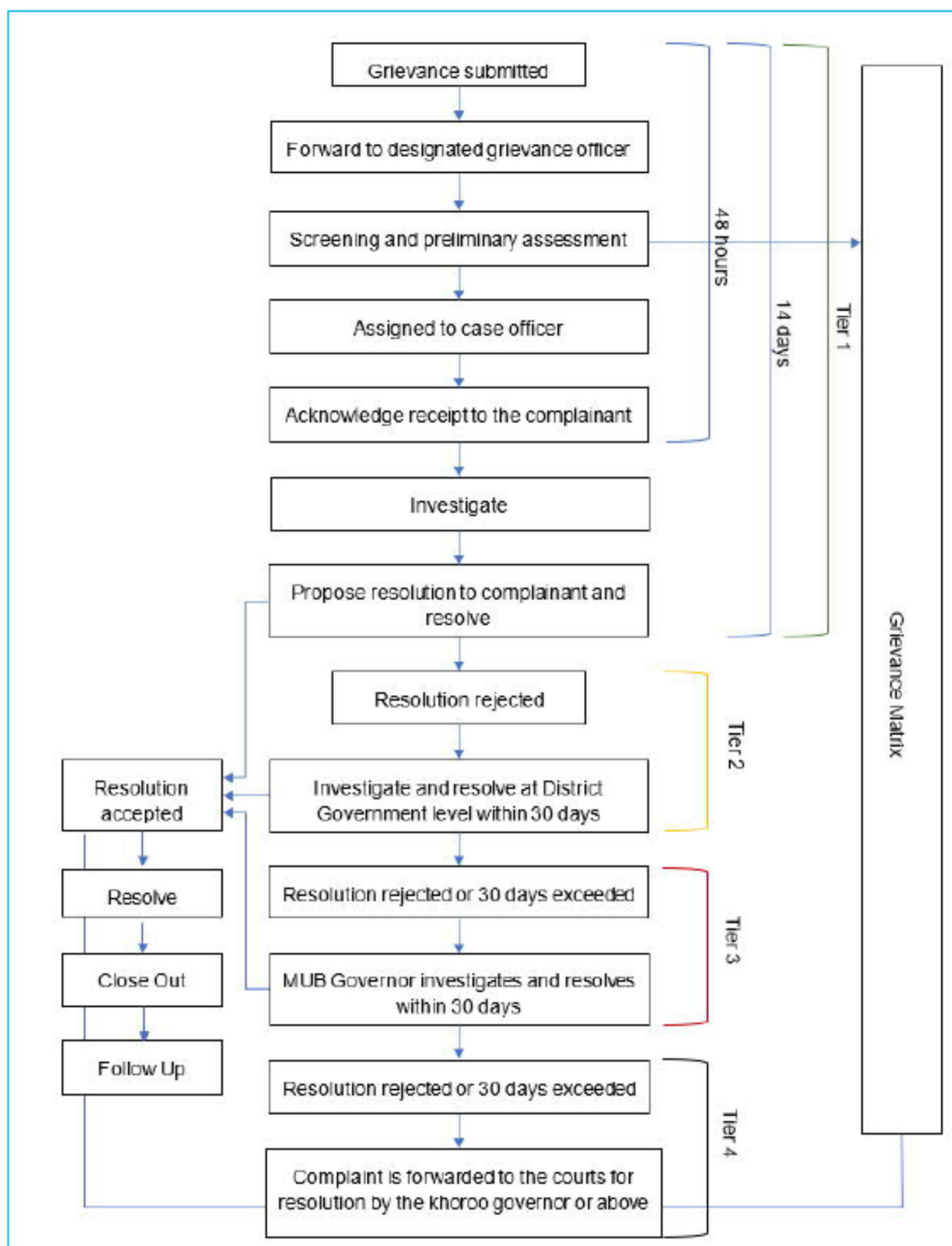
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM



## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contract and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external

investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both an MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.

## **F. Annex B – Public Consultation and Stakeholder Engagement Plan for BWSE**

### **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

### **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

1. Staffing and resources
2. Stakeholder Identification and Analysis
3. Information Disclosure
4. Stakeholder Consultation
5. Partnerships
6. Grievance Management
7. Stakeholder Involvement in Project Monitoring
8. Reporting to Stakeholders
9. Management Functions

### **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social license to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc., filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

### **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

### **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions



6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

1. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
2. Observations by affected parties, triangulated to strengthen validation,
3. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
4. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen

support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

1. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
2. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
3. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
4. Make monitoring results publicly available, especially reports of any external monitors.
5. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
6. Derive an SOP for reporting to stakeholders.

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## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

1. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
2. The hiring and training of community liaison officers
3. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
4. Input and suggestions received from stakeholders on project design and proposed mitigation measures
5. Grievance mechanisms that capture and respond to stakeholder concerns
6. The involvement of local stakeholders in project monitoring
7. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals

- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field- level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes –stakeholder relations becomes a collective responsibility.

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## Appendix G ESMP – CP-2: Advanced Water Purification Plant (AWPP)

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This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-2: Advanced Water Purification Plant (AWPP) of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>78</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

As discussed in Sections 3.2 and 5.2 of the BWSE environmental and social impact assessment (ESIA), the ESIA team eliminated decommissioning from detailed study. Because UB always will require water and therefore a bulk water system, effectively the useful life of the project will not end, and the system will not be decommissioned. Rather, when needed, the bulk water system will be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. Therefore, management measures are not specified for a decommissioning phase. Nonetheless, this ESMP presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken

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<sup>78</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.



- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight
- Estimated Costs – Costs of implementing the management measure and monitoring

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as Technical Specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.

<b>1. Technical Specifications, Division 1 – General Requirements</b>
<b>Section 01030, Special Requirements</b> Health and Safety Plan Product Handling Disposal of excess material Disposal of debris Preconstruction Video Recording of Entire Site Detours and Road Accessibility Permits, Fees and Bonds <b>Section 01046, Control of Work</b> Hours of Construction Open Excavations Occupying Private Land Interference with and Protection of Streets Care and Protection of Property Cleanup and Disposal of Excess Material <b>Section 01063, Miscellaneous Requirements</b> Traffic Control Interference with Existing Utilities Maintaining Flows <b>Section 01110, Environmental Protection Procedures</b> Prevention of Environmental Pollution Erosion Control Protection of Streams, Wetlands and Surface Water Protection of Land Resources Protection of Air Quality Noise Control <b>Section 01500, Temporary Facilities</b> Temporary Field Offices Internet Service Temporary Fence Potable Water Electricity Sanitary Conveniences Barricades and Guard Lights Temporary Heat Shelter and Protection of Materials Security <b>Section 01568, Erosion Control, Sedimentation &amp; Containment of Construction Materials</b> Erosion Control <b>Section 01610, Delivery, Storage and Handling</b> Storage and Handling of Hazardous Materials <b>Section 01700, Contract Closeout</b> Final Cleaning

2. Technical Specifications, Division 2 – Site Work
<p><b>Section 02100, Site Preparation</b></p> <p>Special Requirements</p> <p>Contractor shall repair or replace any structures that are damaged</p> <p>Disposal of waste/surplus materials</p> <p>Inform Owner if there were archeological findings during site preparation</p> <p>Clearing, Grubbing, Tree &amp; Stump Removal</p> <p>Disposal of Waste Materials</p> <p>Sediment and Erosion Control</p> <p><b>Section 02140, Dewatering</b></p> <p>Dewatering</p> <p><b>Section 02210, Earth Excavation, Backfill, Fill and Grading</b></p> <p>Excavation</p> <p>Separation of Excavated Material for Reuse</p> <p>Trench Excavation</p> <p>Reuse and Disposal of Surplus Excavated Materials</p> <p>Care and Restoration of Property</p> <p>Backfilling</p> <p><b>Section 02230, Site Clearing</b></p> <p>Clearing and Grubbing</p> <p><b>Section 02268, Erosion Control Barrier</b></p> <p>Erosion Control Barrier</p> <p><b>Section 02480, Landscaping</b></p> <p>Plants</p> <p>Loam and Seed</p> <p>Planting</p> <p>Maintenance of Seeded Areas and Planting</p> <p><b>Section 02483, Planting Operations</b></p> <p>Planting and Maintenance of Trees, Shrubs and Ground Cover</p> <p><b>Section 02485, Loaming and Seeding</b></p> <p>Loaming and Seeding of disturbed area</p> <p>Wetland Seed Mixture</p> <p>Straw for Erosion Control</p>

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule
- Implementation Budget

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and costs into a workplan, schedule, and budget estimate for implementing the ESMP.

## G.1 Pre-Construction Phase

### G.1.1 Responsibilities During Pre-Construction

#### MCA-Mongolia

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST), led by a Social Manager, that during the pre-construction and construction phases, in coordination with the Contractor, will coordinate with community representatives and liaisons, and project affected persons in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### SST Organization and Staffing

- Social Manager, with suitable experience in resettlement and management of social issues in construction, who will lead the team
- Two Social Safeguards Officers
  - One experienced in liaison with construction companies and familiar with workplace training/toolbox
  - One experienced in social and gender inclusion, who will manage coordination of the MCA-Mongolia Grievance Redress Mechanism (GRM)
- Two Community Liaison Officers who will work at the local level, one assigned to each of Khan-Uul District and Songinokhairkhan District

As needed, MCA-Mongolia or its representative must expand the SST size in relation to the increase in supervision and monitoring of contractors.

#### SST Responsibilities

- Finalize, update, monitor, and report as required on BWSE social plans and those prepared by the Contractor:
  - Labor Management Plan
  - Gender Integration and Social Inclusion Plan
  - Counter-Trafficking in Persons Plan
  - Stakeholder Engagement Plan
  - Construction Camp and Temporary Facilities Management Plan
  - Cultural Heritage Training Plan
- Manage, update, and implement the Stakeholder Engagement Plan
- Plan and lead community consultation meetings
- Ensure the design and delivery of effective information campaigns using all media

- Liaise with the UB MUD regarding the land acquisition and compensation process in resettlement
- Undertake further enquiry among herders as to the pattern of grazing disruption caused by land take and land reclassification
- Liaise with khoroo administration and local communities to negotiate new grazing arrangements for both winter and summer grazing
- Manage and maintain the Grievance Matrix
- Liaise with MCA-Mongolia, MUD, and contractors to implement and assist in resolution of grievances
- Inform community members of employment opportunities
- Assist local people to apply for vacancies through the Ministry of Labor and Social Protection offices
- Liaise with contractors to encourage and promote local employment over imported labor and emphasize the contractual obligations to aim for 30 percent of unskilled and semi-skilled jobs to go to women
- Liaise with experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender-based violence, gender equity, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Monitor and supervise contractor compliance with designing and implementing social policies and plans, training, internal grievance systems, and the MCA-Mongolia GRM
- In cases of internal complaints of sexual harassment or gender based violence within the contractor's grievance mechanism, ensure that an independent investigator is appointed, at the expense of the contractor, to lead the investigation and reporting on the grievance
- Monitor achievement of resettlement and review completion, and recommend further measures if households fail to reinstate their livelihoods
- Finalize the Vulnerable People's Plan and ensure implementation through the Ministry of Labor and Social Protection

## Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by an acceptable CESMP, must be permitted in accordance with all applicable permitting requirements. The Contractor will need to negotiate with and potentially compensate landowners

for temporary use of land. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of this ESMP.

The Contractor will designate an Environmental and Social Performance Manager as a key staff. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Coordinate the Contractor's work related to implementing environmental and social management measures and monitoring
- Work closely with MCA-Mongolia or its representative to require that the Contractor, as needed, incorporates or modifies management measures and monitoring actions to reflect on-site field conditions

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the BWSE GRM



The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored.

#### **Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site
- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring

- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian employment law and ensure each employee has a written contract and is made aware of and signs compliance with the Labor Management Plan
- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response
  - Waste Management
  - Labor Management
  - Gender Integration and Social Inclusion
  - Counter-Trafficking in Persons for Sex
  - Stakeholder Engagement, Community Consultation, and Grievance Redress
  - Construction Camp and Temporary Facilities Management
  - Cultural Heritage Protection
  - Health and Safety Management

### ***Preparation of the Site-Specific CESMP***

The CESMP will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

### ***Management Acknowledgements***

#### **1) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Managing Director(s) attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

#### **2) Statutory Understanding and Compliance**

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

- a) All current environmental laws and regulations, related to, but not limited to, the following:
  - Noise
  - Vibration
  - Air pollution
  - Water contamination

- Solid and hazardous waste disposal
- Waste disposal
- Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
- Use of explosives;
- Protection of public traffic
- Historical, cultural, and archaeological monuments/sites
- Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.

b) All current labor laws and laws related to, but not limited to, the following:

- Contract of employment and labor disputes
- Working conditions
- Management, monitoring, and supervision
- Gender-based discrimination in employment
- Child labor
- Trafficking in persons
- Gender-based violence
- Sexual harassment

c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

### 3) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

### 4) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included for implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

- a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans, documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.
- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

## Organization and Staffing

### 1) Organization Chart

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

## 2) Identification of Responsibilities

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

### a) Environmental and Social Performance Manager

The Environmental and Social Performance Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

### b) Social and Gender Manager

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

### c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative's SST regarding the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with the MCA-Mongolia or its representative's SST over community contacts
- Liaise with the MCA-Mongolia or its representative's SST to implement and assist in resolution of grievances
- Inform the MCA-Mongolia or its representative's SST of employment vacancies and recruit through the Ministry of Labor offices and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project GRM; documenting, reporting, and taking part in finding solutions

3) Appointments

The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager
- Health and Safety Manager

The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Manager, Social and Gender Manager, and Health and Safety Manager will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

### **Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities

#### **1) Environmental, Social and Gender, and Health and Safety Reports**

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.



**Table 1 Summary of Reporting Requirements**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s).</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>

Report	Submission Schedule	Content
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period,</li> <li>• Grievances registered and resolved</li> </ul>

## 2) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes:

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the contractor's organization require reporting to the MCA-Mongolia or its representative. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combatting Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.

## 3) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.

- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### **Environmental, Social and Gender, and Health and Safety Provisions**

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## **G.1.2 Environmental Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **G.1.3 Waste Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **G.1.4 Social and Gender Inclusion**

### **Management Measure AWPP - 1: Labor Management**

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> </ul>

<ul style="list-style-type: none"> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> <li>- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.</li> <li>- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.</li> </ul> </li> </ul>

- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
- Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
  - Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
    - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
  - Ministry of Labor and Social Welfare Order (2016)
    - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
  - International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:



- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth, and disadvantaged groups; 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force

- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a worker's grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.

- In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, and secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation and abuse, and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager

### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the Conditions of Contract, as well as the MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan
  - The MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

MCA-Mongolia or its representative:

- Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor
- Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups
- Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms

Contractor:

- Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)
- Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities
- Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process

#### LOCATIONS:

All construction sites and temporary construction facilities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Required plans written, approved, and implemented
- Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker
- Use of written contracts with defined pay scales by employment activity
- Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers
- Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia
- Percent of all employees that are women, disaggregated by skill/occupational level

<ul style="list-style-type: none"> <li>Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor , such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships Internments established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>100% of employees and sub-contractors sign the Worker Code of Conduct</li> </ul> </li> <li>Resolution of 100% of internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p>	<p><b>MONITORING:</b></p>

<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative
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## Management Measure AWPP - 2: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP)             <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy             <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1             <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2             <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia             <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality             <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor             <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> </ul> </li> </ul>



- Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction

## OBJECTIVES

The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.

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- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level
- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impact of the BWSE project on the project affected communities

## MANAGEMENT MEASURE

### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

#### *Community Engagement*

- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains
  - Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
  - Zero-tolerance of gender-based violence
  - Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan

#### *Expanding Short-term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large-scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques

- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

#### *Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### MONITORING

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities
- Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Employment recruitment activities
- Employment records of workers
- Number, dates, and locations of community engagement meetings
- Community related grievance redress actions and outcomes

- Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders

**Success Criteria:**

- 100% of required community meetings are held, with all topics covered
- Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category
- Employment of young people and “vulnerable” groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Apprenticeships and internships established and completed for each construction season
- Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan
- Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)
  - Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.

**REPORTING:**

- Reports on Gender Integration and Social Inclusion to be included in project monthly reports
- Summarize Gender Integration and Social Inclusion activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**MONITORING:**

*Implementation:*

- Update recording of GSI activities and grievance redress actions as they occur

*Reporting:*

- Monthly in CESMP update

**RESPONSIBILITY**

**MANAGEMENT MEASURE:**

*Implementation:* Contractor  
*Oversight:* Engineer

**MONITORING:**

*Implementation:* Contractor  
*Reporting:* Contractor  
*Oversight:* Engineer

### Management Measure AWPP - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>◦ States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>◦ Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>◦ Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>◦ Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>◦ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
MANAGEMENT MEASURE
<b>Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment</b>

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged



incident of gender-based violence

- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be



communicated in Mongolian, in whole, to project-affected khoroo and District governments.
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p>

### *Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

### *Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

### *Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

### REPORTING:

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports
- Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

### SCHEDULE

#### MANAGEMENT MEASURE:

*Implementation:*

#### MONITORING:

*Implementation:*

<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

## G.1.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## G.1.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure AWPP - 1: Labor Management
- Management Measure AWPP - 2: Gender Integration and Social Inclusion (GSI)
- Management Measure AWPP - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure AWPP - 4: Stakeholder Engagement, Community Consultation, and Grievance Redress

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>IFC Performance Standard 1</li> </ul>

- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities
- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.

#### OBJECTIVES

- Inform and involve all stakeholders
- Have in place a defined policy for dealing with external parties
- Foster positive relations and effective partnerships with local communities throughout project construction and operation
- Maximize the beneficial impact of the BWSE project on the affected communities

#### MANAGEMENT MEASURE

##### Stakeholder Engagement, Community Consultation, and Grievance Redress

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

##### Stakeholder Engagement

- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirements described in Annex B of this ESMP
- At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify:
  - Contractor's responsibilities and participation in community consultation, specifying:
    - A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities
    - How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
    - How information is to be shared with the communities and other project partners
    - Protocols for conducting, recording, and disseminating the results of community consultation
  - Contractor's responsibilities and participation in the project Grievance Redress Mechanism, specifying how the Contractor will:
    - Take action to resolve low level grievances
    - Ensure all employees are trained to understand their role in the project Grievance Redress Mechanism
    - Participate in higher tier grievance resolution
    - Participation in the overall monitoring and evaluation of the project
- The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of this ESMP.

##### Community Consultation

- The MCA-Mongolia or its representatives will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with the MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation
  - Actively promote awareness and disclose information in affected communities on the following

<ul style="list-style-type: none"> <li>○ Purpose, nature, and scale of the project</li> <li>○ Duration of proposed project activities</li> <li>- Record results of Contractor's community consultation activities</li> <li>- Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul>	
<b>Grievance Redress</b> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will: <ul style="list-style-type: none"> <li>- Supervise, and monitor participation by all parties</li> </ul> </li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>- Develop and implement the Grievance Redress Mechanism consistent with Annex A of this ESMP.</li> <li>- Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism</li> <li>- Document all grievance redress actions</li> <li>- Report on the Grievance Redress Mechanism to the Engineer</li> </ul> </li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities and project affected communities	
<b>MONITORING</b>	
<b>MCA-Mongolia or its representative</b> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul>	
<b>Contractor</b> <ul style="list-style-type: none"> <li>• Document all Contractor's stakeholder engagement and consultation activities</li> <li>• Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities and project affected communities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<b>Indicators:</b> <ul style="list-style-type: none"> <li>• Number, content, and outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> <li>○ Grievance redress actions</li> </ul> </li> </ul>	
<b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> </ul> </li> <li>• Resolution of grievances</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i>	<b>MONITORING:</b> <i>Implementation:</i>

<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
MANAGEMENT MEASURE:	MONITORING:
<p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### G.1.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

### G.1.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In



coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## G.2 Construction Phase

### G.2.1 Responsibilities During Construction

#### MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) to coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### Contractor

Unless otherwise specified for individual management measures, the construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards, and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## G.2.2 Environmental Management

### Management Measure AWPP - 5: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>- Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>- Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>- Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>- Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Mongolian Law on Labor Safety and Hygiene</li> <li>- Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> <li>• Mongolian Criminal Code</li> <li>- Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> <li>• IFC Performance Standards 1, 3, and 4</li> <li>- Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning</li> <li>- Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Emergency Preparedness and Response</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer’s written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul> <p><b>Hazardous Materials Management</b></p> <ul style="list-style-type: none"> <li>• Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials</li> <li>• Develop prioritized material-specific handling procedures and training requirements as necessary according to risk</li> <li>• Assign an officer to manage and advise on hazardous materials management</li> </ul> <p><i>Handling</i></p> <ul style="list-style-type: none"> <li>• Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient</li> <li>• Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities</li> <li>• Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)</li> <li>• Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells</li> </ul> <p><i>Transport</i></p> <ul style="list-style-type: none"> <li>• Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials</li> </ul>

- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

#### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

#### **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

#### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.
- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

#### **Emergency Preparedness and Response Plan**

- Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan

<ul style="list-style-type: none"> <li>- Specifies: <ul style="list-style-type: none"> <li>o Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment</li> <li>o Potential emergencies and key areas prone to emergency situations</li> <li>o Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.</li> <li>o Actions to be taken prior to an emergency—i.e., preventive and preparatory measures</li> <li>o Actions to be taken during an emergency—i.e., response measures</li> <li>o Actions to be taken after an emergency—i.e., recovery and assessment measures</li> <li>o Contact lists for emergency situations</li> <li>o Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas</li> </ul> </li> <li>- Assigns roles and responsibilities for emergency preparedness and response</li> <li>• Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities</li> <li>• In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof</li> </ul>	
LOCATIONS:	
All construction sites and temporary construction facilities	
<b>MONITORING</b>	
Document submission and approval of plan	
LOCATIONS:	
All construction sites and temporary construction facilities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	MONITORING:  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	



MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### Management Measure AWPP - 6: Mongolian Marmot Protection and Habitat Restoration

POTENTIAL IMPACT
Disturbance of endangered Mongolia marmot ( <i>Marmota sibirica</i> ) and loss and disturbance of marmot habitat
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires researching and establishing the potential for State and regional development, the restoration, breeding and raising of endangered animals, protection of soil, water, and air, and for humans to live in a healthy.</li> </ul> </li> <li>Mongolian Law on Fauna               <ul style="list-style-type: none"> <li>Requires the approval of the government based on the conclusions of an environmental impact assessment of the construction of industrial plants, power stations within the territory of extremely rare fauna.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Prohibits implementing any activities that leads to a net reduction in the national/regional population of any Critically Endangered or Endangered species over a reasonable period.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>Minimize disturbance of Mongolian marmots</li> <li>Habitat restoration to achieve a net gain in Mongolian marmot habitat</li> </ul>
MANAGEMENT MEASURE
<b>Mongolian Marmot Protection and Habitat Restoration</b>  <b>Protection and Habitat Restoration</b> MCA-Mongolia will, with reference to the figure below: <ul style="list-style-type: none"> <li>Designate construction-phase marmot protection zone extending a minimum of 200 meters from the outermost flight burrows</li> <li>Prohibit the operation of any motorized vehicles, including cars and all-terrain vehicles, and restrict foot traffic within construction-phase marmot protection zone by MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel</li> <li>Develop and implement marmot protection training to be required of all construction-phase MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel and visitors to project facilities and construction sites in the vicinity of the AWPP</li> </ul> The Contactor will be responsible for: <ul style="list-style-type: none"> <li>The design and construction of the following:               <ul style="list-style-type: none"> <li>Approximately 500-meter long, 2-meter high earthen berm between existing marmot burrow clusters and the proposed AWPP, located no closer than 100 meters from the flight burrows and planted with native shrubs and perennial plants, to limit disturbance of marmots</li> </ul> </li> </ul> MCA-Mongolia will employ or contract an experienced biodiversity specialist to develop and implement the following Mongolian marmot construction-phase monitoring and long-term protection program <b>Construction-Phase Monitoring and Long-term Protection</b> Prepare, submit, and implement Mongolian Marmot Monitoring and Evaluation Plan for the Engineer's written approval, to monitor and evaluate Mongolian marmot population density and structure, reproduction, and mortality in the vicinity of the proposed AWPP and replacement access road and

pedestrian path to the Monument to Terror Victims, and existing and proposed walking trail to the sacred ovoo on Songinokhairkhan Mountain. The plan will specify roles and responsibilities for marmot monitoring and evaluation.

The plan may include but not be limited to the following, as determined by the biodiversity specialist and approved by the Engineer:

*Mapping*

- Burrow clusters
- Family and individual home ranges
- Vegetation
- BWSE-related and other human encroachment

*Monitoring activities*

- Use of drone equipped with thermal imaging camera
- Direct observation aided by binoculars and spotting scopes
- Use of automatic camera trap
- Capture with or without marking

*Monitoring parameters*

- Burrow cluster population
- Age of individuals
- Sex of individuals
- Home range size
- Number of families
- Family composition
- Number of pups
- Activity/Behavior
- Predation
- Survival and mortality
- Total population
- Age and sex distribution of population

Observations are to be repeated during the morning and evening active periods.

Monitoring data for the selected parameters will be evaluated as construction, and operation and maintenance progress for changes attributed to loss of marmot habitat or disturbance of marmots. The monitoring and evaluation plan will specify impact indicators and impact criteria determined by the biodiversity specialist and approved by the Engineer.

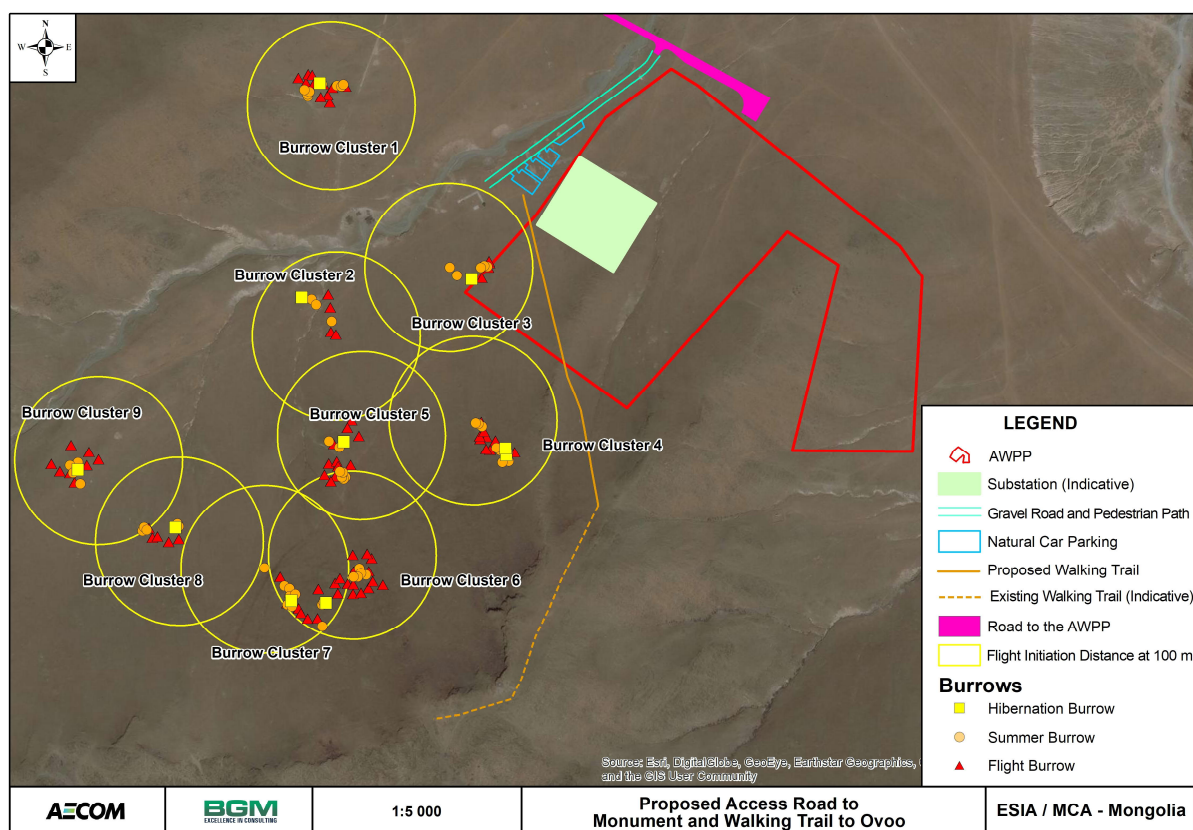
Exceedance of any of the impact criteria will trigger, ***independent of this management measure***, preparing, submitting, and implementing protective actions, in addition to those specified above, formulated to avoid, minimize, or offset the observed adverse impact. Such actions may include the following, as well as other measures recommended by the biodiversity specialist:

- Constructed buffers; e.g., vegetated earth berms
- Rock piles where marmots can watch for predators, thermoregulate, and dig burrows
- Spill protection measures
- Permanent Mongolian marmot protection zone
- Driving restrictions; e.g., prohibit or control off-road driving, set speed limits, restrict non-essential traffic to daytime
- Marmot protection and avoidance training
- Warning and interpretive signage
- Supplemental feeding to increase reproduction and survival, and attract marmots away from roads

The Contractor will be requested to provide a quotation to implement such actions identified by the biodiversity specialist should the impact criteria be triggered.

**LOCATIONS:**

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan



Mountain, as located on the following figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults:

## MONITORING

Document submission and approval of plan

### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the above figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults

### INDICATORS AND SUCCESS CRITERIA:

#### Indicators:

- Development and implementation of protection and habitat restoration measures
- Submission of construction-phase monitoring and long-term protection plan
- Collection and evaluation of Mongolian marmot population density and structure, reproduction, and mortality data
- Specific impact criteria and indicators specified in approved plan

#### Success Criteria:

- Monitoring and protection plan approval
- Identification of and timely response to changes attributed to loss of marmot habitat or disturbance of marmots

### REPORTING:

- Report communications and written approval of Engineer of Construction-Phase Monitoring and Long-Term Protection Plan
- Report monitoring activities and data evaluation findings
- Report impact criteria exceedances and recommended protective actions to be implemented
- Summarize other activities undertaken during reporting period

<ul style="list-style-type: none"> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Annual, beginning prior to construction mobilization and continuing throughout construction, commissioning, and contract operations period Year 1 and Year 2</li> <li>Late March to late September monitoring season, comprising four monitoring periods: <ul style="list-style-type: none"> <li>Late March/early April (post hibernation)</li> <li>Late June/early July (pups feeding outside burrows)</li> <li>Mid-August (newborn survival and mortality)</li> <li>Late September (pre hibernation)</li> </ul> </li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> MCA-Mongolia and Biodiversity specialist employed by or contracted to MCA-Mongolia <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Biodiversity specialist <i>Reporting:</i> Biodiversity specialist and Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## G.2.3 Waste Management

### Management Measure AWPP - 7: Waste Management

<b>POTENTIAL IMPACT</b>
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Mongolian Law on Hazardous and Toxic Chemicals <ul style="list-style-type: none"> <li>Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>Mongolian Law on Sanitation <ul style="list-style-type: none"> <li>Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>Mongolian Law on Waste <ul style="list-style-type: none"> <li>Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> <li>Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste</li> <li>Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).</li> </ul>

- Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes
  - Requires providing personal protective equipment to the organization's waste management officer.
- Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste
- Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).
- IFC Performance Standards 3 and 4
  - Encourages recovering and reusing waste in a manner that is safe for human health and the environment.
- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
  - Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.

#### OBJECTIVES

- Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes

#### MANAGEMENT MEASURE

##### Waste Management

The Contractor will:

- Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements:
  - Paragraph 1.04.E Hazardous Waste Management Plan
  - Paragraph 1.14 Disposal of Excess Material
  - Paragraph 1.21 Disposal of Debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures:
  - Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner
  - Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes



- Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer’s written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor’s comprehensive commitment to the standards and requirements listed above and specified in the plan
- Assigns roles and responsibilities for waste management
- Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available

#### LOCATIONS:

All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of

#### MONITORING

Document:



<ul style="list-style-type: none"> <li>Provision, maintenance, and/or updating of: <ul style="list-style-type: none"> <li>MSDSs</li> <li>Secondary containment capacity for all storage of liquid hazardous materials</li> <li>Tanks and sumps inspection records</li> <li>Spill kits</li> <li>First aid</li> <li>Waste inventory</li> <li>Waste management training</li> </ul> </li> <li>Submission and approval of site-specific Waste Management Plan</li> </ul>	
<b>LOCATIONS:</b> All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of	
<b>INDICATORS AND SUCCESS CRITERIA:</b> <b>Indicators:</b> <ul style="list-style-type: none"> <li>Submission of site-specific Waste Management Plan</li> <li>Volumes of waste generated</li> <li>Volumes of waste sent for off-site recycling</li> <li>Number of reported non-compliances with the controls identified in the plan</li> <li>Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>Number of reported waste incidents</li> <li>Number of waste related community complaints</li> <li>Instances of off-site contamination identified</li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>Approval of site-specific Waste Management Plan</li> <li>Minimize volume of waste generated</li> <li>Maximize volume of waste sent for off-site recycling</li> <li>Zero: <ul style="list-style-type: none"> <li>Reported non-compliances with the controls identified in the plan</li> <li>Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>Reported waste incidents</li> <li>Number of waste related community complaints</li> <li>Instances of off-site contamination identified</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Management measure and plan implementation throughout construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul>

	<i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## G.2.4 Social and Gender Inclusion

### Management Measure AWPP - 8: Labor Management

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>Women's short-term employment in construction and engineering-related work</li> <li>Potential alleviation of poverty in local area</li> <li>Reduction in child labor</li> <li>Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Constitution of Mongolia             <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code             <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>Mongolian Law on Gender Equality             <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor             <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>Mongolian Law on Minimum Wage             <ul style="list-style-type: none"> <li>Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> </ul>

- Mongolian Law on the Protection of the Rights of the Child
  - Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children
- Mongolian Law on Social Protection of Disabled Persons
  - Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- Mongolian Law on Combating Human Trafficking
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
  - Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level

- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
  - Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
  - Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
  - International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor’s cooperation with the local District Labor Offices
- Facilitate the Contractor’s publication of vacancies and procurements within affected communities
- Facilitate the Contractor’s holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors’ engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth, and disadvantaged groups; 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on "Gender," "Engagement of Staff and Labor," "Foreign Personnel," "Prohibition of Forced or Compulsory Labor," "Prohibition of Harmful Child Labor," "Employment Records of Workers," and "Non-Discrimination and Equal Opportunity."

### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a worker's grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on "Prohibition of Sexual Harassment"
- The Contractor shall note the contract clause on "Facilities for Staff and Labor" and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, and secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to "adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds" per the contract clause on "Engagement of Staff and Labor," the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)



- Gender-based violence
- Contractor's Anti-sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation and abuse, and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
- Using the internal Grievance Mechanism for allegations of gender-based discrimination
- Rights to have access to local festivals
- Cultural sensitivities, and social norms and practices in each area
- Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
- Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
- Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager

#### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the Conditions of Contract, as well as the MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan
  - The MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

MCA-Mongolia or its representative:

- Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor

<ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Required plans written, approved, and implemented</li> <li>• Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>• Use of written contracts with defined pay scales by employment activity</li> <li>• Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> <li>• Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>• Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>• Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>• Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>○ Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>○ Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Apprenticeships and internships Internments established and completed for each construction season</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>○ All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>○ 100% of employees and sub-contractors sign the Worker Code of Conduct</li> <li>• Resolution of 100% of internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>• Implementation of above provisions throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training as it occurs</li> <li>• Document implementation of above provisions as it occurs</li> <li>• Maintain employee records as required above</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### Management Measure AWPP - 9: Gender Integration and Social Inclusion (GSI)

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Increased short-term employment and improved conditions of employment for women</li> <li>• Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> </ul>

<ul style="list-style-type: none"> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>○ Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>○ Encourages contractors to employ women as at least 30% of workers</li> <li>○ Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>• Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>○ The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>○ Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>○ Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>○ Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>○ Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>○ Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>○ Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
<p><b>OBJECTIVES</b></p> <p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <p>T</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impact of the BWSE project on the project affected communities</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p> <p><b>Gender Integration and Social Inclusion</b></p> <ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district</li> </ul>

and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.

- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

#### *Community Engagement*

- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains
  - Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
  - Zero-tolerance of gender-based violence
  - Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan

#### *Expanding Short-term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

#### *Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to

<p>provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</p> <ul style="list-style-type: none"> <li>The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>MONITORING</b></p> <p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>Monitor Contractor Gender Integration and Social Inclusion Plan</li> <li>Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>Employment recruitment activities</li> <li>Employment records of workers</li> <li>Number, dates, and locations of community engagement meetings</li> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>



<ul style="list-style-type: none"> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> Engineer

### Management Measure AWPP - 10: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to</li> </ul> </li> </ul>

<p>perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”</p> <ul style="list-style-type: none"> <li>○ Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”</li> <li>○ Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
<p><b>OBJECTIVES</b></p>
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p>
<p><b>Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment</b></p>
<p>The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers’ induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.</p> <p><i>Counter Trafficking in Persons (C-TIP)</i></p> <ul style="list-style-type: none"> <li>• The Contractor shall prepare and submit for the Engineer’s written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements. <ul style="list-style-type: none"> <li>○ The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers’ passports and commercial sex with minors,</li> <li>○ Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.</li> <li>○ Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.</li> </ul> </li> </ul>

- Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and

including an Incident Reporting and Referral Plan.

- The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
- The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contactor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### MONITORING

MCA-Mongolia or its representative's SST:

- Monitor Contractor Counter-Trafficking in Persons Response Plan
- Monitor Contractor performance related to gender-based violence requirements
- Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses

Contractor:

- Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms

<ul style="list-style-type: none"> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via: <ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> </ul> </li> </ul>

- The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
- Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
- 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

**Sexual harassment**

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

**REPORTING:**

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports
- Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**MONITORING:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**RESPONSIBILITY**

**MANAGEMENT MEASURE:**

*Implementation:* Contractor  
*Oversight:* Engineer

**MONITORING:**

*Implementation:* Contractor  
*Oversight:* Engineer – MCA-Mongolia or its representative's Social Safeguards Team

**Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management**

**POTENTIAL IMPACT**

Risks and impacts that may be associated with workers' accommodation and workplace conditions

**STANDARD(S) / REQUIREMENT(S) TRIGGERED:**

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:



- Constitution of Mongolia
- Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.
- Mongolian Civil Code
- Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.
- Mongolian Labor Code
- Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.
- Mongolian Law on Labor Safety and Hygiene
- Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.
- Mongolian Law of Fire Safety
- Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.
- Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33
- Prohibits precluding to conclude a contract of legal entities and organizations.
- IFC Performance Standards 2 and 4
- Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.
- Mongolian Law on Combating Human Trafficking
- Requires having a written management plan on worker camps and housing facilities.
- IFC and EBRD (2009) guidance at *Workers' Accommodation: Processes and Standards*<sup>1</sup>
- Requires having a written management plan on worker camps and housing facilities.
- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
- Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.

#### OBJECTIVES

- Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.

#### MANAGEMENT MEASURE

##### Construction Camp and Temporary Facilities Management

The Contractor will:

- Fully comply with the requirements of this management measure
- Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment
- Ensure compliance with IFC and EBRD (2009) guidance at *Workers' Accommodation: Processes and Standard* for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.
- Ensure compliance with IFC and EBRD guidance at *Workers' Accommodation: Processes and Standards* for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.
- Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at *Workers' Accommodation: Processes and Standards*
- Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality

<ul style="list-style-type: none"> <li>• Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work</li> <li>• Provide all accommodation sites with sufficient supplies and services</li> <li>• Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition</li> <li>• Conduct visual checks on site to ensure proper housekeeping</li> <li>• Ensure suitable first aid equipment is kept on site, at various appropriate locations</li> <li>• Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required</li> <li>• Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies</li> <li>• Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on: <ul style="list-style-type: none"> <li>- Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>- General waste management, housekeeping, first aid practices, and communicable diseases</li> </ul> </li> <li>• Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>- Assigns roles and responsibilities for construction camp and temporary facilities management</li> </ul> </li> </ul>	
<p><b>LOCATIONS:</b></p> <p>All areas within and immediately surrounding construction camps and other temporary facilities</p>	
<p><b>MONITORING</b></p>	
<p>Document:</p> <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training</li> <li>• Submission and approval of plan</li> </ul>	
<p><b>LOCATIONS:</b></p> <p>All areas within and immediately surrounding construction camps and other temporary facilities</p>	
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>	
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training sessions</li> <li>• Submission of plan</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Plan approval</li> <li>• Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p>

<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and annually thereafter</li> <li>Implementation of above provisions throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training</li> <li>Document implementation of above provisions</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure AWPP - 12: Cultural Heritage Protection

<b>POTENTIAL IMPACT</b>
<ul style="list-style-type: none"> <li>Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> <li>Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> <li>Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Mongolian Law on Protection of Cultural Heritage <ul style="list-style-type: none"> <li>If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protect the intangible cultural heritage.</li> </ul> </li> <li>IFC Performance Standard 8 <ul style="list-style-type: none"> <li>Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> <li>Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Protect tangible cultural heritage from inadvertent excavation or damage</li> <li>Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Cultural Heritage Protection</b></p> <p><b>Chance Find Procedure</b></p> <p>As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.</p>

Should any unexpected tangible cultural heritage be discovered:

- Cease all work in the immediate area and do not disturb the chance find further, including:
  - Establishing a 30-meter buffer around the chance find
  - Leaving buffer undisturbed until competent cultural heritage specialist assesses the site
  - Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.
- Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area
- Immediately notify the Engineer and the concerned government agencies, specifically the:
  - Office of the governor of the capital city
  - Office of governor of the Songinokhairkhan District
  - Local police
  - Institute of Archeology, Mongolian Academy of Sciences
  - Institute of History and Ethnography, Mongolian Academy of Sciences
- Provide the following information to the Engineer and government agencies:
  - Cultural heritage site type—description and photograph(s)
  - Location—description and GPS coordinates
  - Date, time, and details of find
  - Nature of work that led to exposure of or locating the find
- Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation
- Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage
- Restart work only upon written direction from the Engineer

#### **Cultural and Sacred Landscape and Places**

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

#### **Training**

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

- Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum:
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities
  - Assigns roles and responsibilities for training
- Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.

#### **LOCATIONS:**

- All work sites
- Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred

MONITORING
<p>Monitor throughout construction</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>Construction work sites during excavation or other ground disturbance</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Communications SST Community Liaison Officers and Engineer</li> <li>Written directions of Engineer</li> <li>Actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Document submission and approval of training plan</li> <li>Document training of personnel as specified in approved plan</li> </ul>
<p>LOCATIONS:</p> <ul style="list-style-type: none"> <li>All work sites</li> </ul>
<p>INDICATORS AND SUCCESS CRITERIA:</p> <p>Indicators:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>Chance find of tangible cultural heritage</li> <li>Excavation or damage of tangible cultural heritage</li> <li>Cease work decision</li> <li>Protection of chance find area and tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Submission of training plan</li> <li>Date and location of training sessions, or as specified in approved plan</li> <li>Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Training plan approval</li> <li>All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>
<p>REPORTING:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>Report chance find and cease work decision</li> <li>Report excavation or damage of tangible cultural heritage</li> <li>Report actions to protect chance find area and tangible cultural heritage</li> <li>Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Report communications with SST Community Liaison Officers and Engineer</li> <li>Report directions of Engineer</li> <li>Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul>

<p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>• Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<p>MANAGEMENT MEASURE:</p> <p><i>Implementation:</i></p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> <li>• Continuous during excavation or other ground disturbance</li> </ul> <p>Cultural and Sacred Landscape and Places</p> <ul style="list-style-type: none"> <li>• As required, periodically throughout project construction</li> </ul> <p>Training</p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Personnel training in accordance with timing and frequency specified in approved plan; at minimum, once at beginning of each construction season</li> </ul>	<p>MONITORING:</p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>• Document communications with SST Community Liaison Officers and the Engineer, and written directions of Engineer as they occur</li> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training sessions and personnel start, training, and field deployment as the occur, or as specified in approved plan</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p>MANAGEMENT MEASURE:</p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p>MONITORING:</p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## G.2.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure AWPP - 5: Emergency Preparedness and Response
- Management Measure AWPP - 7: Waste Management
- Management Measure AWPP – 9: Gender Integration and Social Inclusion (GSI)
- Management Measure AWPP – 10 Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment



- Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management

### Management Measure AWPP - 13: Health and Safety Management

POTENTIAL IMPACT
Health and safety risks and impacts on work sites and in construction camps, and in the community
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>- Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>- Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>• IFC Performance Standard 4 <ul style="list-style-type: none"> <li>- Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>- Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>- Provides guidance on occupational health and safety and community health and safety.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Identify, assess, manage, and record and communicate all health and safety hazards, and ensure: <ul style="list-style-type: none"> <li>- Resulting risks to people, property, assets, and the environment are evaluated</li> <li>- Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical</li> <li>- Any requirements to mitigate risks are implemented</li> <li>- Risks and actions to manage them are reported and communicated</li> </ul> </li> </ul>
MANAGEMENT MEASURE
<h3>Health and Safety Management</h3> <p>The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.</p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup></li> <li>• Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to: <ul style="list-style-type: none"> <li>○ Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan</li> <li>○ Section 01046 Control of Work, Paragraph 3.05 Open Excavations</li> <li>○ Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets</li> <li>○ Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control</li> <li>○ Protect drinking water sources, whether public or private, at all times</li> </ul> </li> <li>• Prepare and implement a traffic control plan for accessing the site, approved by Engineer</li> <li>• Implement all reasonable precautions to protect the health and safety of workers</li> <li>• Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers</li> </ul>

- Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities
- Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident
- Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities
- Avoid or minimize traffic accidents and promote traffic safety by all project personnel
- Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials
- Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures
- Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice
- Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project
- Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply
- Specifies:
  - Site security, including securing of excavations, hazardous materials, etc.
  - Confined space safety procedures
  - Excavation and trenching safety measures
  - First aid facilities, equipment, and materials
  - Protective clothing and safety equipment
  - HIV/AIDS awareness program
  - Covid-19 awareness program
  - Counter-trafficking in persons program
  - Health and Safety management monitoring and reporting
- Assigns roles and responsibilities for health and safety management

**LOCATIONS:**

All project sites and surrounding communities

**MONITORING**

Document submission and approval of plan

**LOCATIONS:**

All project sites and surrounding communities

**INDICATORS AND SUCCESS CRITERIA:**

Indicators:

- Submission of plan

Success Criteria:

<ul style="list-style-type: none"> <li>Plan approval</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## G.2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure AWPP - 5: Emergency Preparedness and Response
- Management Measure AWPP - 6: Mongolian Marmot Protection and Habitat Restoration
- Management Measure AWPP - 7: Waste Management
- Management Measure AWPP - 8: Labor Management
- Management Measure AWPP - 9: Gender Integration and Social Inclusion (GSI)
- Management Measure AWPP - 10: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management
- Management Measure AWPP - 12: Cultural Heritage Protection

- Management Measure AWPP - 13: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

#### **Management Measure AWPP - 14: Stakeholder Engagement, Community Consultation, and Grievance Redress**

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b></p> <p>The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.</p> <p><b>Stakeholder Engagement</b></p> <ul style="list-style-type: none"> <li>• The Contractor will: <ul style="list-style-type: none"> <li>➤ Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework</li> <li>➤ Maintain, revise, and update the project Stakeholder Engagement Matrix</li> <li>➤ Document all stakeholder engagement activities in the Stakeholder Engagement Matrix:</li> </ul> </li> </ul> <p><b>Community Consultation</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will <ul style="list-style-type: none"> <li>- Introduce Contractor's officers to communities</li> <li>- Monitor and supervise Contractor contacts with communities and other stakeholders</li> <li>- Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted</li> </ul> </li> <li>• In coordination with the MCA-Mongolia or its representative, the Contractor will <ul style="list-style-type: none"> <li>➤ Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the</li> </ul> </li> </ul>

<p>MCA- Mongolia Grievance Redress Mechanism, and other issues that arise during consultation</p> <p>➤ Document all community consultation activities in the Stakeholder Engagement Matrix</p>	
<p><b>Grievance Redress</b></p> <ul style="list-style-type: none"> <li>The MCA-Mongolia or its representative will supervise, and monitor participation by all parties</li> <li>The Contractor will: <ul style="list-style-type: none"> <li>Implement the Grievance Redress Mechanism consistent with Annex A of this ESMP</li> <li>Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism</li> <li>Document all grievance redress actions in the Stakeholder Engagement Matrix</li> <li>Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer</li> </ul> </li> </ul>	
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities</p>	
<p><b>MONITORING</b></p>	
<p><b>MCA-Mongolia or its representative</b></p> <ul style="list-style-type: none"> <li>Monitor Contractor contacts with stakeholders and communities</li> <li>Monitor participation by all parties in Grievance Redress Mechanism</li> </ul>	
<p><b>Contractor</b></p> <ul style="list-style-type: none"> <li>Document all stakeholder engagement activities</li> <li>Document all community consultation activities</li> <li>Record results of Contractor's community consultation activities</li> <li>Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>	
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities</p>	
<p>INDICATORS AND SUCCESS CRITERIA:</p>	
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> </ul> </li> </ul>	
<p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
<p>REPORTING:</p> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p>MANAGEMENT MEASURE:</p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities</li> </ul>	<p>MONITORING:</p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community</li> </ul>

and ongoing throughout pre-construction and construction	consultation activities, and grievance redress actions occur <i>Reporting:</i> • Monthly in ESMP update
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## G.2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## G.2.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.



With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## G.3 Implementation Work Plan and Schedule

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.

## G.4 Implementation Budget

Implementation, including monitoring, of the ESMP management measures, with one exception, do not entail a marginal cost. Costs are reflected MCA-Mongolia or its representative's operating costs, the Contractor's construction contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The cost of obtaining all required permits are deemed to be included in the Contractor's contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The costs of implementing ESMP management measures are primarily driven by staff costs. Other costs are associated with development of policies and plans, training, and equipment.

### MCA-Mongolia or Its Representative's Costs

Staff Costs				
Role	Cost	Unit	Total	Assumption
Environmental and Social Manager	-	salary	-	Covered in Section F.6
Waste Management Manager	-	salary	-	Covered in Section F.6
HSE Manager	-	salary	-	Covered in Section F.6
Social Manager	-	salary	-	Covered in Section F.6
Social Safeguards Officers	-	salary	-	Covered in Section F.6
Community Liaison Officers	-	salary	-	Covered in Section F.6
Staff Costs Total			-	

Marmot Monitoring Costs				
Description	Cost	Unit	Total	Assumption
Binoculars	\$350.00	each	\$700.00	2 pairs

<b>GPS</b>	\$350.00	each	\$350.00	1 piece
<b>Camera</b>	\$1,000.00	each	\$1,000.00	1 piece
<b>Car rental</b>	\$55.00	per day	\$4,400.00	Four 4-day missions per year for 5 years
<b>Experts in field</b>	\$50.00	per day	\$8,000.00	Two experts, four 4-day missions per year for 5 years
<b>Reporting on each mission</b>	\$50.00	per day	\$8,000.00	Two experts, four 4-day missions per year for 5 years
<b>Marmot Monitoring Costs Total</b>			<b>\$22,450.00</b>	

## Contractor Costs

CP-2 Staffing Requirements			
<b>Total staff on CP-2 contract</b>	<b>200</b>	staff	Assumed
<b>HR Team</b>	5	staff	Manager + 1 HR staff/50 employees
<b>HSE Team</b>	5	staff	Manager + 1 HSE staff/50 employees
<b>Social Safeguards Officer</b>	2	staff	2 officers for CP-2
<b>Construction Camp Management Team</b>	3	staff	Manager + 1 support staff/100 employees
<b>Expected duration of Construction</b>	<b>38</b>	months	Estimated

ESMP Management Measures Cost Estimate:

Staff Costs				
<b>Role</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
<b>HR Manager</b>	\$ 2,000.00	salary	\$ 76,000.00	5.0 million MNT/month + benefits
<b>HR staff</b>	\$ 1,000.00	salary	\$ 152,000.00	2.5 million MNT/month + benefits
<b>HSE Manager</b>	\$ 2,000.00	salary	\$ 76,000.00	5.0 million MNT/month + benefits
<b>HSE staff</b>	\$ 1,000.00	salary	\$ 152,000.00	2.5 million MNT/month + benefits
<b>Social Safeguards Officers</b>	\$ 1,000.00	salary	\$ 76,000.00	2.5 million MNT/month + benefits
<b>Construction Camp Manager</b>	\$ 2,000.00	salary	\$ 76,000.00	5.0 million MNT/month + benefits
<b>Construction Camp Management Team</b>	\$ 1,000.00	salary	\$ 76,000.00	2.5 million MNT/month + benefits
<b>Staff Costs Subtotal</b>			<b>\$ 684,000.00</b>	

Cost of HR Office				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 10,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 1,500.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 4,750.00	1 per HR staff per month
Vehicles	\$ 100.00	per day	\$ -	no project vehicles for HR staff (office job)
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 9,500.00	stationary and petty expenses per month
HR Office Costs Subtotal			\$ 26,750.00	
Cost of HSE Office				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 10,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 1,500.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 4,750.00	1 per HR staff per month
Vehicles	\$ 50,000.00	each	\$ 50,000.00	1 project vehicle purchased for all HSE staff (reduced site extension)
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 9,500.00	stationary and petty expenses per month
PPE for visitors and spares	\$ 100.00	per set	\$ 6,000.00	20 sets for visitors + enough for 20% of staff requirements as spares.
HR Office Costs Subtotal			\$ 82,750.00	
Cost of SSO Office				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 4,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 600.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 1,900.00	1 per HR staff per month
Vehicles	\$ 50,000.00	each	\$ 50,000.00	1 project vehicle purchased for all SSO staff (reduced site extension)
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 9,500.00	stationary and petty expenses per month
Regular Community Liaison	\$ 60.00	per day	\$ 11,400.00	Stakeholder and community liaison 5 days per month
Community Town Hall and Training	\$ 500.00	per day	\$ 19,000.00	once per month (in suitable venue with refreshments)
HR Office Costs Subtotal			\$ 97,400.00	
Plan and Policy Development Costs				
Description	Cost	Unit	Total	Assumption

Labor Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR Expert, 5 days @ \$500/day
Gender Integration and Social Inclusion Plan	\$ 2,500.00	each	\$ 2,500.00	GSI Expert, 5 days @ \$500/day
CTIP Plan	\$ 1,000.00	each	\$ 1,000.00	Expert, 2 days @ \$500/day
Code of Conduct	\$ 2,500.00	each	\$ 2,500.00	Psychologist/HR expert, 5 days @ \$500/day
Stakeholder Engagement Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Grievance Redress Mechanism (GRM)	\$ 2,000.00	each	\$ 2,000.00	Expert, 4 days @ \$500/day
Health and Safety Management Plan	\$ 2,500.00	each	\$ 2,500.00	HSE Expert, 5 days @ \$500/day
Covid-19 Prevention Plan	\$ 500.00	each	\$ 500.00	Expert, 1 days @ \$500/day
Emergency Preparedness and Response Plan	\$ 1,000.00	each	\$ 1,000.00	HSE Expert, 2 days @ \$500/day
Waste Management Plan (WMP)	\$ 1,000.00	each	\$ 1,000.00	Expert for 2 days @ \$500/day
Construction Camp and Temporary Facilities Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR/HSE Experts, 5 days @ \$500/day
Training Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Plan and Policy Development Costs Subtotal			\$ 23,000.00	
<b>Training Costs</b>				
<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
HR Policy Training	\$ 500.00	coach/day	\$ 4,000.00	2 day course for HR staff once a year @ \$500/day
Code of Conduct Training	\$ 500.00	coach/day	\$ 40,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Staff Training	\$ 500.00	coach/day	\$ 4,000.00	2 day course for HSE staff once a year @ \$500/day
HSE Training	\$ 500.00	coach/day	\$ 40,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Orientation for visitors	\$ -	as necessary	\$ -	Included of HSE staff duties
First Aid training	\$ 500.00	coach/day	\$ 1,000.00	1 training per year for first aid volunteer staff (~10% of staff), full day, groups of ten max. (\$500/day for coach)
Emergency Preparedness and Response Training - HSE Staff	\$ 500.00	coach/day	\$ 2,000.00	1 day course for HSE staff once a year @ \$500/day

Emergency Preparedness and Response Training - all staff	\$ -	per employee	\$ -	Included in HSE training
ESMP Implementation Training Plan	\$ -	per employee	\$ -	Included in HSE training
WMP Training	\$ -	per employee	\$ -	Included in HSE training
Tangible Cultural Heritage Protection Training	\$ -	per employee	\$ -	Included in HSE training
Biodiversity Training	\$ -	per employee	\$ -	Included in HSE training
CTIP Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
CTIP Orientation for subcontractors and service providers	\$ -	per employee	\$ -	Included in HSE Orientation
Anti-Sexual Harassment and Discrimination Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
On-job training, apprenticeships, internships	\$ -	as required	\$ -	Included in staff costs (as per Labor Management Plan)
Community training in HSE, CTIP	\$ -	as required	\$ -	Included in Community Liaison (SSO )
Training Costs subtotal			\$ 91,000.00	
<b>Equipment and Other Costs</b>				
<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
PPE equipment (hard hat, boots, hi-vis clothing, glasses, gloves)	\$ 100.00	per employee	\$ 80,000.00	PPE provided to all employees each year
First aid kits	\$ 100.00	each	\$ 2,000.00	1 kit per 10 employees
Emergency Response Plan Dissemination	\$ 2,500.00	overall	\$ 2,500.00	Posters, brochures, etc. at site/ camp indicating emergency procedures and phone numbers
Spill protection equipment	\$ 2,500.00	overall	\$ 2,500.00	Spill sheets for all vehicles, regularly changed.
GRM implementation	\$ -	per year	\$ -	Implementation of the GRM by HR staff/Social Safeguards Officer
Contract with Landfill for inert waste	\$ -	per year	\$ -	Covered in cost of construction operations
Contract with Hazardous waste company	\$ -	per year	\$ -	Covered in cost of construction operations

Bins at construction camp	\$ -	each	\$ -	Covered in cost of construction camp
Cultural Heritage - protection of known sites	\$ -	each	\$ -	Covered in cost of construction operations
Cultural Heritage - chance find	\$ 6,000.00	each	\$ 6,000.00	Assume one chance find at AWPP site - site has already been survey by archeologists and paleontologists.
Biodiversity Monitoring Equipment	\$ 1,380.00	all	\$ 1,380.00	Binoculars, Camera, GPS
Equipment and Other Costs Subtotal			\$ 94,380.00	
<b>ESMP Management Measures Costs Total</b>			<b>\$ 1,099,280.00</b>	



## G. Annex A – Grievance Resolution Mechanism

The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>79</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

3. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
4. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>80</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>81</sup> References available upon request to MCA.

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<sup>79</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>80</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>81</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017

The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.

- **Step 9 - Follow-up:** Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

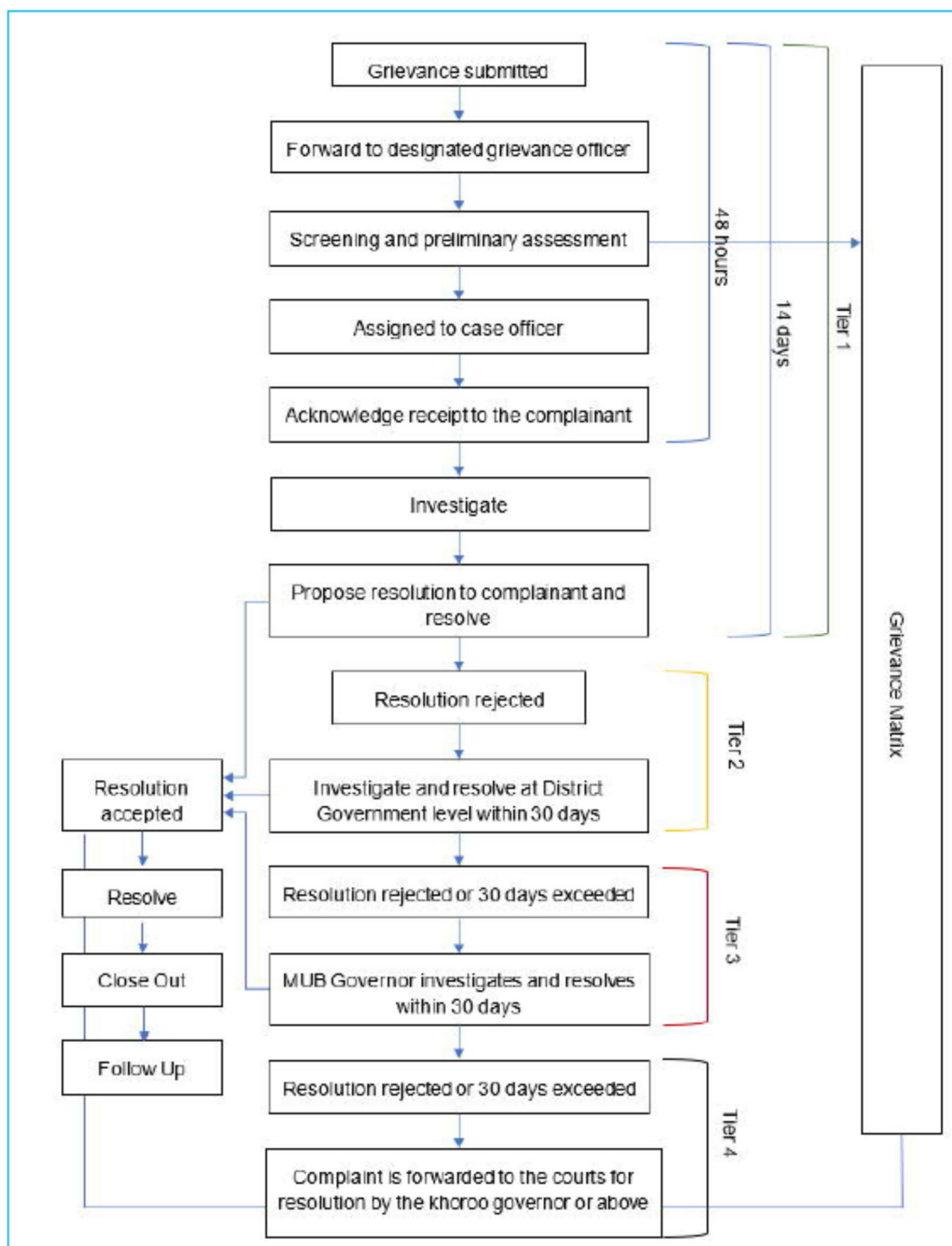
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM



## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contact and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external

investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both an MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.



## **G. Annex B - Public Consultation and Stakeholder Engagement Plan for BWSE**

### **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

### **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

10. Staffing and resources
11. Stakeholder Identification and Analysis
12. Information Disclosure
13. Stakeholder Consultation
14. Partnerships
15. Grievance Management
16. Stakeholder Involvement in Project Monitoring
17. Reporting to Stakeholders
18. Management Functions

### **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social license to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc., filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

### **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

### **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions

6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

5. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
6. Observations by affected parties, triangulated to strengthen validation,
7. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
8. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen

support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

7. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
8. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
9. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
10. Make monitoring results publicly available, especially reports of any external monitors.
11. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
12. Derive an SOP for reporting to stakeholders.

## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

8. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
9. The hiring and training of community liaison officers
10. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
11. Input and suggestions received from stakeholders on project design and proposed mitigation measures
12. Grievance mechanisms that capture and respond to stakeholder concerns
13. The involvement of local stakeholders in project monitoring
14. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals



- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field-level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes – stakeholder relations becomes a collective responsibility.

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## Appendix H ESMP – CP-3: Raw and Finished Water Conveyance

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This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-3: Raw and Finished Water Conveyance of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). As needed, the ESMP specifies compensation for adverse impacts if mitigation is not feasible, cost-effective, or sufficient. Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>82</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

As discussed in Sections 3.2 and 5.2 of the BWSE environmental and social impact assessment (ESIA), the ESIA team eliminated decommissioning from detailed study. Because UB always will require water and therefore a bulk water system, effectively the useful life of the project will not end, and the system will not be decommissioned. Rather, when needed, the bulk water system will be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. Therefore, management measures are not specified for a decommissioning phase. Nonetheless, this ESMP presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact

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<sup>82</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight
- Estimated Costs – Costs of implementing the management measure and monitoring

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as technical specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.

### **Technical Specifications, Division 1 – General Requirements**

#### **Section 01030, Special Requirements**

- Site-specific health and safety plan
- Site-specific emergency action plan
- Site-specific hazardous waste management plan
- Backfilling operations following pipe laying
- Application of clean water to control dust
- Removal and legal disposal of unsuitable material and excess material
- Disposal of debris
- Preconstruction Video Recording of Entire Site
- Detours and Road Accessibility
- Owner Obtained Permits

#### **Section 01046, Control of Work**

- Hours of Construction
- Safeguarding of Open Excavations
- Occupying Private Land
- Protection of Streets
- Care and Protection of Property

#### **Section 01063, Miscellaneous Requirements**

- Traffic Control
- Maintain Flows of Existing Utilities

#### **Section 01110, Environmental Protection Procedures**

- Protection of Existing Structures and Utilities
- Cleanup and Disposal of Excess Material
- Prevention of Environmental Pollution
- Erosion Control
- Protection of Streams, Wetlands and Surface Water
- Protection of Land Resources
- Protection of Air Quality
- Noise Control

#### **Section 01500, Temporary Facilities**

- Field Offices
- Visitor Center
- Internet Service
- Telephone Service
- Temporary Perimeter Fence
- Potable Water for Construction and Domestic Purposes
- Temporary Electrical
- Temporary Sanitary Conveniences
- Barricades
- Temporary Heat
- Shelter and Protection of Materials
- Site Security

### **Technical Specifications, Division 2 – Site Work**

#### **Section 02100, Site Preparation**

- Special Requirements
- Contractor shall repair or replace any structures that are damaged
- Disposal of waste/surplus materials
- Inform Owner if there were archeological findings during site preparation
- Clearing, Grubbing, Tree & Stump Removal
- Disposal of Waste Materials
- Sediment and Erosion Control

#### **Section 02140, Dewatering**

- Dewatering

#### **Section 02210, Earth Excavation, Backfill, Fill and Grading**

- Excavation
- Separation of Excavated Material for Reuse
- Trench Excavation
- Reuse and Disposal of Surplus Excavated Materials
- Care and Restoration of Property
- Backfilling

#### **Section 02230, Site Clearing**

- Clearing and Grubbing

#### **Section 02268, Erosion Control Barrier**

- Erosion Control Barrier

#### **Section 02480, Landscaping**

- Plants
- Loam and Seed
- Planting
- Maintenance of Seeded Areas and Planting

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule
- Implementation Budget

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and costs into a workplan, schedule, and budget estimate for implementing the ESMP.

## H.1 Pre-Construction Phase

### H.1.1 Responsibilities During Pre-Construction

#### MCA-Mongolia

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) and coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### *SST Organization and Staffing*

- Social Manager, with suitable experience in resettlement and management of social issues in construction, who will lead the team
- Two Social Safeguards Officers
  - One experienced in liaison with construction companies and familiar with workplace training/toolbox
  - One experienced in social and gender inclusion, who will manage coordination of the MCA-Mongolia Grievance Redress Mechanism (GRM)
- Two Community Liaison Officers who will work at the local level, one assigned to each of Khan-Uul District and Songinokhairkhan District

As needed, MCA-Mongolia or its representative must expand the SST size in relation to the increase in supervision and monitoring of contractors.



## **SST Responsibilities**

- Finalize, update, monitor, and report as required on BWSE social plans and those prepared by the Contractor:
  - Labor Management Plan
  - Gender Integration and Social Inclusion Plan
  - Counter-Trafficking in Persons Plan
  - Stakeholder Engagement Plan
  - Construction Camp and Temporary Facilities Management Plan
  - Cultural Heritage Training Plan
- Manage, update, and implement the Stakeholder Engagement Plan
- Plan and lead community consultation meetings
- Ensure the design and delivery of effective information campaigns using all media
- Liaise with the UB MUD regarding the land acquisition and compensation process in resettlement
- Undertake further enquiry among herders as to the pattern of grazing disruption caused by land take and land reclassification
- Liaise with khoroo administration and local communities to negotiate new grazing arrangements for both winter and summer grazing
- Manage and maintain the Grievance Matrix
- Liaise with MCA-Mongolia, MUD, and contractors to implement and assist in resolution of grievances
- Inform community members of employment opportunities
- Assist local people to apply for vacancies through the Ministry of Labor and Social Protection offices
- Liaise with contractors to encourage and promote local employment over imported labor and emphasize the contractual obligations to aim for 30 percent of unskilled and semi-skilled jobs to go to women
- Liaise with experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender-based violence, gender equity, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Monitor and supervise contractor compliance with designing and implementing social policies and plans, training, internal grievance systems, and the MCA-Mongolia GRM
- In cases of internal complaints of sexual harassment or gender based violence within the contractor's grievance mechanism, ensure that an independent investigator is appointed, at the expense of the contractor, to lead the investigation and reporting on the grievance
- Monitor achievement of resettlement and review completion, and recommend further measures if households fail to reinstate their livelihoods
- Finalize the Vulnerable People's Plan and ensure implementation through the Ministry of Labor and Social Protection

## **Contractor**

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by an acceptable CESMP, must be permitted in accordance with all applicable permitting requirements, and may be subject to a RAP. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of this ESMP.

The Contractor will designate an Environmental and Social Performance Manager. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Coordinate the Contractor's work related to implementing environmental and social management measures and monitoring
- Work closely with MCA-Mongolia or its representative to require that the Contractor, as needed, incorporates or modifies management measures and monitoring actions to reflect on-site field conditions

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their

attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the BWSE GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored.

#### **Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site

- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring
- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian employment law and ensure each employee has a written contract and is made aware of and signs compliance with the Labor Management Plan
- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response
  - Waste Management
  - Labor Management
  - Gender Integration and Social Inclusion
  - Counter-Trafficking in Persons for Sex
  - Stakeholder Engagement, Community Consultation, and Grievance Redress
  - Construction Camp and Temporary Facilities Management
  - Cultural Heritage Protection
  - Health and Safety Management

### ***Preparation of the Site-Specific CESMP***

The CESMP will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

### ***Management Acknowledgements***

#### **1) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Managing Director(s) attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest

priority in the discharge of contractual obligations and certifying a commitment to the provisions in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

## 2) Statutory Understanding and Compliance

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

a) All current environmental laws and regulations, related to, but not limited to, the following:

- Noise
- Vibration
- Air pollution
- Water contamination
- Solid and hazardous waste disposal
- Waste disposal
- Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
- Use of explosives;
- Protection of public traffic
- Historical, cultural, and archaeological monuments/sites
- Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.

b) All current labor laws and laws related to, but not limited to, the following:

- Contract of employment and labor disputes
- Working conditions
- Management, monitoring, and supervision
- Gender-based discrimination in employment
- Child labor
- Trafficking in persons
- Gender-based violence
- Sexual harassment

c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

## 3) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

## 4) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included for implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

- a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans,

documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.

- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

## **Organization and Staffing**

### **1) Organization Chart**

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

### **2) Identification of Responsibilities**

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Manager, Social and Gender Manager, and Health and Safety Manager appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

#### **a) Environmental and Social Performance Manager**

The Environmental and Social Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Performance Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

#### **b) Social and Gender Manager**

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be



empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative's SST the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with MCA-Mongolia or its representative's SST over community contacts
- Liaise with MCA-Mongolia or its representative's SST to implement and assist in resolution of grievances

- Inform MCA-Mongolia or its representative's SST of employment vacancies and recruit through the Ministry of Labor offices and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project MCA-Mongolia GRM; documenting, reporting, and taking part in finding solutions

### 3) Appointments

The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager
- Health and Safety Manager

The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Manager, Social and Gender Manager, and Health and Safety Manager will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

### **Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities

### 1) Environmental, Social and Gender, and Health and Safety Reports

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.

**Table 1 Summary of Reporting Requirements**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s).</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>

Report	Submission Schedule	Content
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period</li> <li>• Grievances registered and resolved</li> </ul>

## 2) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes::

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the contractor's organization require reporting to the MCA-Mongolia or its representative. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combatting Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction

## 3) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.



- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### **Environmental, Social and Gender, and Health and Safety Provisions**

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## **H.1.2 Environmental Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **H.1.3 Waste Management**

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## **H.1.4 Social and Gender Inclusion**

### **Management Measure Conveyance - 1: Labor Management**

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> </ul>

<ul style="list-style-type: none"> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> <li>- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.</li> <li>- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.</li> </ul> </li> </ul>

- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
- Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
- Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
- Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
- International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative's Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor, and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and, youth, and disadvantaged groups, 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level, and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a workers' grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment

- Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues.



<p>These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager</p> <p><i>Site-specific Labor Management Plan</i></p> <p>The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct</li> <li>• Is consistent and compliant with: <ul style="list-style-type: none"> <li>○ Mongolian Law on Labor</li> <li>○ Relevant aspects of the Conditions of Contract, as well MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>○ The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>• Assigns roles and responsibilities for labor management</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged and other excluded groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Required plans written, approved, and implemented</li> <li>• Number, content, and outcome of employment against home location (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>• Use of written contracts with defined pay scales by employment activity</li> <li>• Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> </ul>

<ul style="list-style-type: none"> <li>• Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>• Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>• Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>• Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> <li>• Number of apprenticeship and internships established and completed</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>○ Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>○ Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Apprenticeships and internships Internments established and completed for each construction season</li> <li>○ All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> </ul> </li> <li>• 100% of employees and sub-contractors sign the worker code of conduct</li> <li>• Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training as it occurs</li> <li>• Document implementation of above provisions as it occurs</li> <li>• Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p>

<ul style="list-style-type: none"> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## Management Measure Conveyance - 2: Gender Integration and Social Inclusion (GSI)

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP)             <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy             <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1             <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2             <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia             <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality</li> </ul>

<ul style="list-style-type: none"> <li>○ Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>○ Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>○ Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <p>T</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impact of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</li> <li>○ Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> </ul> <p><i>Community Engagement</i></p> <ul style="list-style-type: none"> <li>• The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>○ Efforts to hire local labor and the Contractor's employment forecast</li> <li>○ Efforts to maximize women's employment</li> <li>○ Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>○ Prohibitions against child labor and forced labor in supply chains</li> <li>○ Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>○ Zero-tolerance of gender-based violence</li> <li>○ Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> </ul> <p><i>Expanding Short-term Employment Opportunities</i></p>

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large-scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

#### *Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### MONITORING

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities
- Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Employment recruitment activities
- Employment records of workers
- Number, dates, and locations of community engagement meetings
- Community related grievance redress actions and outcomes
- Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders

**Success Criteria:**

- 100% of required community meetings are held, with all topics covered
- Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category
- Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Apprenticeships and internships established and completed for each construction season
- Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan
- Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)
  - Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.

**REPORTING:**

- Reports on Gender Integration and Social Inclusion to be included in project monthly reports
- Summarize Gender Integration and Social Inclusion activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**MONITORING:**

*Implementation:*

- Update recording of GSI activities and grievance redress actions as they occur

*Reporting:*

- Monthly in CESMP update

**RESPONSIBILITY**

**MANAGEMENT MEASURE:**

**MONITORING:**



<i>Implementation:</i> Contractor	<i>Implementation:</i> Contractor
<i>Oversight:</i> Engineer	<i>Reporting:</i> Contractor
	<i>Oversight:</i> Engineer

### Management Measure Conveyance - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>○ Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>○ Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> </ul>

- To prevent incidences of gender-based violence involving workers

## MANAGEMENT MEASURE

### Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and

<p>LGBTQ+ persons</p> <ul style="list-style-type: none"> <li>▪ Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> <li>• Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Ttrafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> </ul>

- Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints
- Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training

**Success Criteria:**

*Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

*Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

*Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

**REPORTING:**

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports
- Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period

<ul style="list-style-type: none"> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

## H.1.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## H.1.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure Conveyance - 1: Labor Management
- Management Measure Conveyance - 2: Gender Integration and Social Inclusion (GSI)
- Management Measure Conveyance - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure Conveyance - 4: Stakeholder Engagement, Community Consultation, and Grievance Redress

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>



Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- IFC Performance Standard 1
  - Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities
  - Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.

#### OBJECTIVES

- Inform and involve all stakeholders
- Have in place a defined policy for dealing with external parties
- Foster positive relations and effective partnerships with local communities throughout project construction and operation
- Maximize the beneficial impact of the BWSE project on the affected communities

#### MANAGEMENT MEASURE

##### Stakeholder Engagement, Community Consultation, and Grievance Redress

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

##### Stakeholder Engagement

- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirements described in Annex B of this ESMP
- At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify:
  - Contractor's responsibilities and participation in community consultation, specifying:
    - A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities
    - How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
    - How information is to be shared with the communities and other project partners
    - Protocols for conducting, recording, and disseminating the results of community consultation
  - Contractor's responsibilities and participation in the project Grievance Redress Mechanism, specifying how the Contractor will:
    - Take action to resolve low level grievances
    - Ensure all employees are trained to understand their role in the project Grievance Redress Mechanism
    - Participate in higher tier grievance resolution
    - Participation in the overall monitoring and evaluation of the project
- The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of this ESMP.

##### Community Consultation

- The MCA-Mongolia or its representatives will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with the MCA-Mongolia or its representative, the Contractor will:

<ul style="list-style-type: none"> <li>- Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation</li> <li>- Actively promote awareness and disclose information in affected communities on the following <ul style="list-style-type: none"> <li>o Purpose, nature, and scale of the project</li> <li>o Duration of proposed project activities</li> </ul> </li> <li>- Record results of Contractor's community consultation activities</li> <li>- Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul>
<p><b>Grievance Redress</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will: <ul style="list-style-type: none"> <li>- Supervise, and monitor participation by all parties</li> </ul> </li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>- Develop and implement the Grievance Redress Mechanism consistent with Annex A of this ESMP.</li> <li>- Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism</li> <li>- Document all grievance redress actions</li> <li>- Report on the Grievance Redress Mechanism to the Engineer</li> </ul> </li> </ul>
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p><b>MONITORING</b></p>
<p><b>MCA-Mongolia or its representative</b></p> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul> <p><b>Contractor</b></p> <ul style="list-style-type: none"> <li>• Document all Contractor's stakeholder engagement and consultation activities</li> <li>• Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities and project affected communities</p>
<p>INDICATORS AND SUCCESS CRITERIA:</p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Number, content, and outcome of: <ul style="list-style-type: none"> <li>o Stakeholder engagement activities</li> <li>o Community consultation activities</li> <li>o Grievance redress actions</li> </ul> </li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>o Stakeholder engagement activities</li> <li>o Community consultation activities</li> </ul> </li> <li>• Resolution of grievances</li> </ul>
<p>REPORTING:</p> <ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>
<p><b>SCHEDULE</b></p>

MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
RESPONSIBILITY	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## H.1.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## H.1.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-

Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## H.2 Construction Phase

### H.2.1 Responsibilities During Construction

#### MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST), to coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP..

#### Contractor

Unless otherwise specified for individual management measures, the construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## H.2.2 Environmental Management

### Management Measure Conveyance - 5: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>- Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>- Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>- Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Impact Assessment</li> <li>- Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> <li>• Mongolian Law on Labor Safety and Hygiene</li> <li>- Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> <li>• Mongolian Criminal Code</li> <li>- Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> <li>• IFC Performance Standards 1, 3, and 4</li> <li>- Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning</li> <li>- Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Emergency Preparedness and Response</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor's site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul> <p><b>Hazardous Materials Management</b></p> <ul style="list-style-type: none"> <li>• Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials</li> <li>• Develop prioritized material-specific handling procedures and training requirements as necessary according to risk</li> <li>• Assign an officer to manage and advise on hazardous materials management</li> </ul> <p><i>Handling</i></p> <ul style="list-style-type: none"> <li>• Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient</li> <li>• Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities</li> <li>• Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)</li> <li>• Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells</li> </ul>



### *Transport*

- Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials
- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

### **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.
- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.

- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

#### **Emergency Preparedness and Response Plan**

- Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:

<ul style="list-style-type: none"> <li>- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>- Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan</li> <li>- Specifies: <ul style="list-style-type: none"> <li>o Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment</li> <li>o Potential emergencies and key areas prone to emergency situations</li> <li>o Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.</li> <li>o Actions to be taken prior to an emergency—i.e., preventive and preparatory measures</li> <li>o Actions to be taken during an emergency—i.e., response measures</li> <li>o Actions to be taken after an emergency—i.e., recovery and assessment measures</li> <li>o Contact lists for emergency situations</li> <li>o Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas</li> </ul> </li> <li>- Assigns roles and responsibilities for emergency preparedness and response</li> <li>• Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities</li> <li>• In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof</li> </ul>	
LOCATIONS:	
All construction sites and temporary construction facilities	
<b>MONITORING</b>	
Document submission and approval of plan	
LOCATIONS:	
All construction sites and temporary construction facilities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MONITORING:
Implementation:	Implementation:

<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### Management Measure Conveyance - 6: Tree Relocation and Revegetation

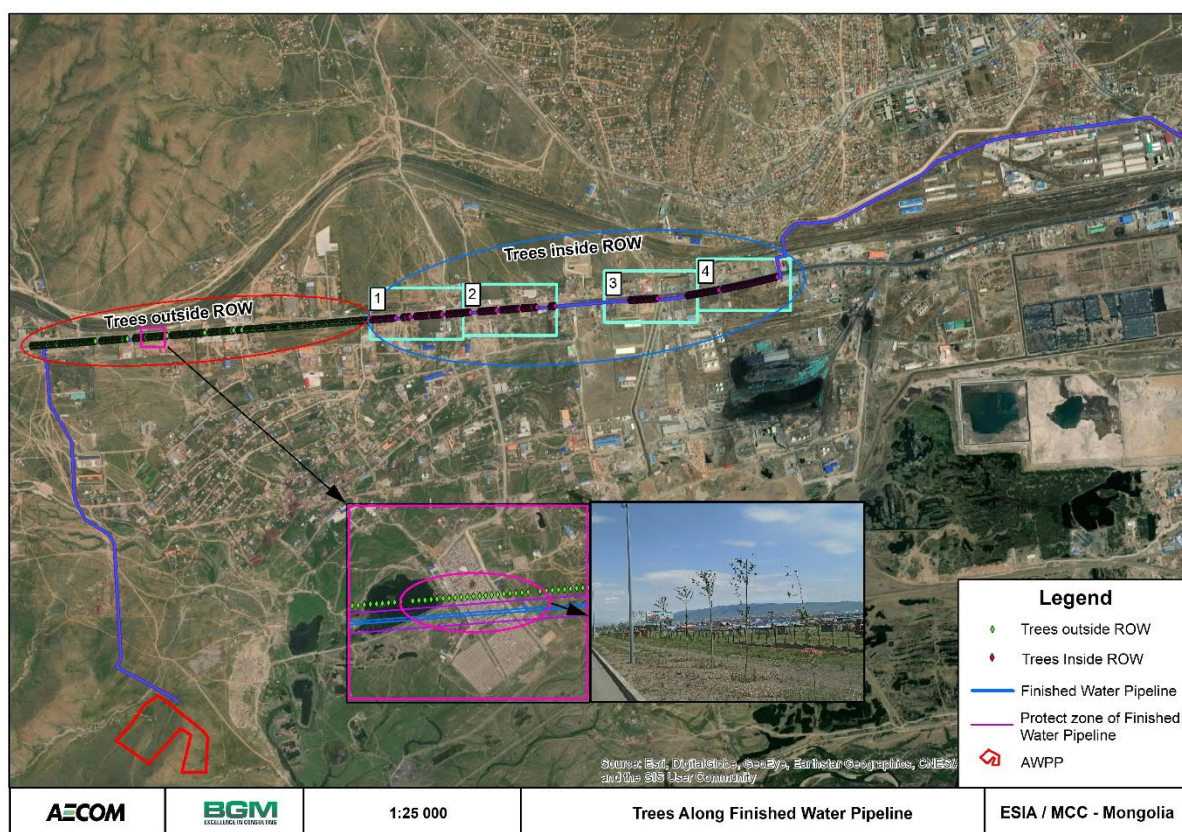
<b>POTENTIAL IMPACT</b>
Disturbance and removal of planted trees along the finished water pipeline
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>MNS 6774:2019 Transplanting and care of large trees seedlings. Technical requirement <ul style="list-style-type: none"> <li>This standard applies to the transplanting and maintenance of large trees and seedlings for landscaping of public, limited and special purpose green areas in cities and towns. The following documents are cited in this standard, and in the event of changes to these standards, reference shall be made to the most recent official material: <ul style="list-style-type: none"> <li>MNS 4969: 2000 Organization of training. Basic rule</li> <li>MNS 6139: 2010 Seedlings of coniferous trees. Technical requirement</li> <li>MNS 6254: 2011 Growing seedlings of trees and shrubs. General requirement</li> <li>MNS 6258-1 : 2011 Planting and pitting seedlings hole. General requirement</li> <li>MNS 6258-2 : 2011 Caring of tree and brush seedlings</li> <li>GOST 24909: 81 Seedlings of ornamental deciduous trees. Specifications</li> <li>GOST 25769-83 Conifers seedlings for planting in towns. Specifications</li> <li>GOST 28829-90 Seedlings of decorative trees and bushes in containers. Specifications</li> </ul> </li> </ul> </li> <li>Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>IFC Performance Standard 6 <ul style="list-style-type: none"> <li>Requires that impacts to biodiversity be offset.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Relocation of affected trees and revegetation of disturbed soils</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Tree Relocation and Revegetation</b></p> <p>The removal of trees and other vegetation will be kept to the minimum necessary to accommodate the permanent works that are indicated by the project drawings.</p> <p>The Contractor will prepare, submit, and implement a Tree Replanting and Revegetation Plan for the Engineer's written approval. The plan will include but not be limited to the following:</p> <ul style="list-style-type: none"> <li>Follow all applicable ESMP mitigation measures and Contract documents.</li> </ul>

- Replant all removed trees at locations where they will not interfere with safety or proposed project assets.
- The existing trees in the protection zone of the pipeline will be removed and replanted, rather than replaced, whenever possible. If a tree is damaged during removal it will be replaced.
- In concurrence with the Engineer, trees outside of the protection zone that hinder or obstruct work, or interfere with project assets will be removed and replanted, rather than replaced, whenever possible. If a tree is damaged during removal it will be replaced.
- The existing trees will be replanted next to the protection zone if there is room available; where there is no room, they will be replanted in a different location based on discussion with the local authority and concurrence of the Engineer.
- Replanted and replaced trees that die within 1 year of planting will be replaced by the Contractor.
- Ensure that any exposed surfaces are revegetated at the completion of works and in accordance with instructions of the Engineer.
- A replanting and revegetation schedule.
- A monitoring plan and schedule to ensure success in the first year of replanting and revegetation

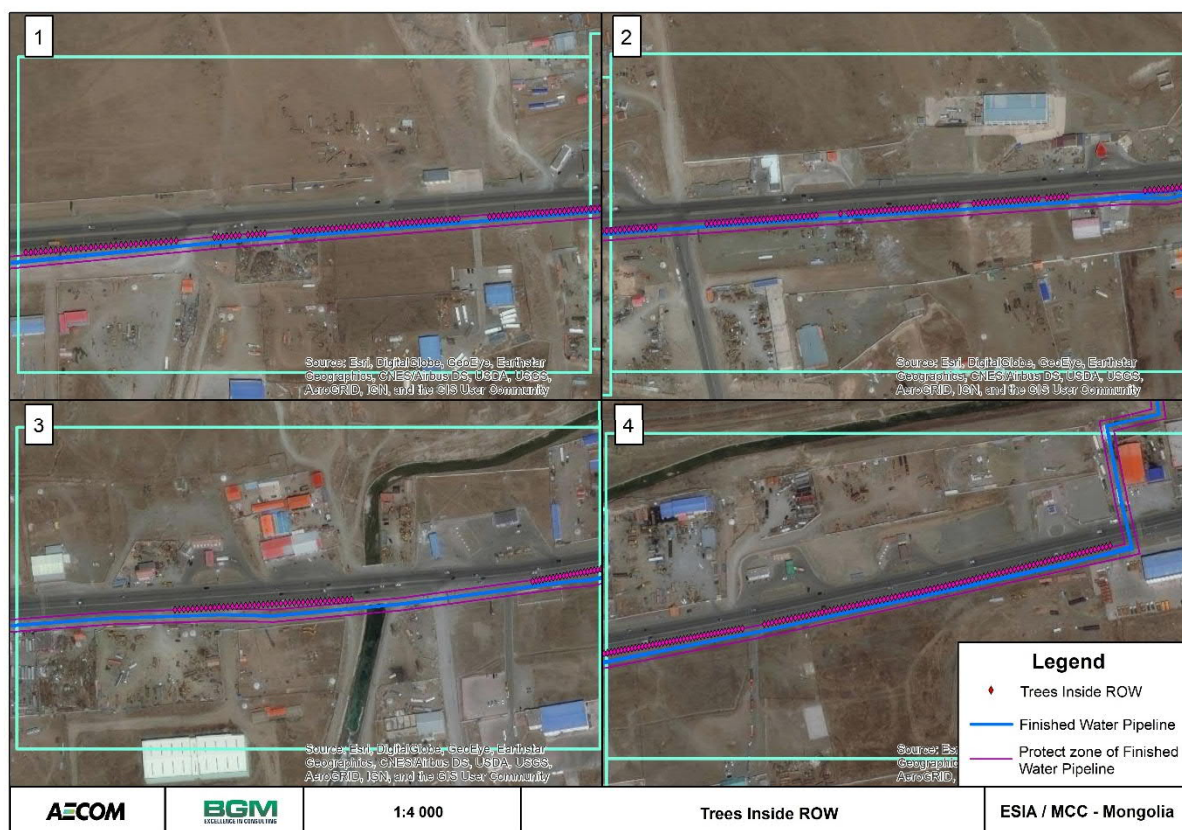
Trees along the finished water pipeline are cared for by the local authority. After replanting, in concurrence of the Engineer, the Contractor will provide formal notice to local authority to resume plant care.

#### LOCATIONS:

As indicated in the following figures, there are 879 trees along the AH3 Highway, parallel to the route of the finished water pipeline; of these 397 are within the protection zone of the pipeline and will need to be removed and relocated. In concurrence with the Engineer, the Contractor may identify trees outside of the protection zone requiring removal as they hinder or obstruct works, or interfere with project assets.







## MONITORING

### Document submission and approval of plan

#### LOCATIONS:

As indicated in the above figures, there are 879 trees along the AH3 Highway, parallel to the route of the finished water pipeline; of these 397 are within the protection zone of the pipeline and will need to be removed and relocated. In concurrence with the Engineer, the Contractor may identify trees outside of the protection zone requiring removal as they hinder or obstruct works, or interfere with project assets.

#### INDICATORS AND SUCCESS CRITERIA:

##### Indicators:

- Implementation of tree replanting and revegetation measures
- Submission of construction-phase Tree Planting and Revegetation Plan
- Specific impact criteria and indicators specified in approved plan
- Number of trees removed from along the AH3 highway
- Number of trees replanted next to the projection zone
- Number of trees replanted in different locations
- Number of trees replaced
- Hectares of exposed surfaces revegetated

##### Success Criteria:

- Tree replanting plan approval
- All removed trees replanted or replaced
- All replanted or replaced trees survive 1 year or replaced
- All exposed surfaces revegetated within 1 year

#### REPORTING:

- Report communications and written approval of Engineer of the Tree Replanting and Revegetation Plan
- Report monitoring activities and data evaluation findings



<ul style="list-style-type: none"> <li>Report impact criteria exceedances and recommended protective actions to be implemented</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
REPORTING:	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Schedule as indicated in plan.</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Monitoring schedule as indicated in plan</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### Management Measure Conveyance - 7: Mongolian Marmot Protection and Habitat Restoration

<b>POTENTIAL IMPACT</b>
Disturbance of endangered Mongolia marmot ( <i>Marmota sibirica</i> ) and loss and disturbance of marmot habitat
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires researching and establishing the potential for State and regional development, the restoration, breeding and raising of endangered animals, protection of soil, water, and air, and for humans to live in a healthy.</li> </ul> </li> <li>Mongolian Law on Fauna               <ul style="list-style-type: none"> <li>Requires the approval of the government based on the conclusions of an environmental impact assessment of the construction of industrial plants, power stations within the territory of extremely rare fauna.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Prohibits implementing any activities that leads to a net reduction in the national/regional population of any Critically Endangered or Endangered species over a reasonable period.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Minimize disturbance of Mongolian marmots</li> <li>Habitat restoration to achieve a net gain in Mongolian marmot habitat</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Mongolian Marmot Protection and Habitat Restoration</b> <b>Protection and Habitat Restoration</b> MCA-Mongolia will, with reference to the figure below: <ul style="list-style-type: none"> <li>Designate construction-phase marmot protection zone extending a minimum of 200 meters from the outermost flight burrows</li> </ul>

- Prohibit the operation of any motorized vehicles, including cars and all-terrain vehicles, and restrict foot traffic within construction-phase marmot protection zone by MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel
- Develop and implement marmot protection training to be required of all construction-phase MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel and visitors to project facilities and construction sites in the vicinity of the AWPP

The Contractor will be responsible for:

- Contract the design and construction of the following:
- Approximately 25-meter long, 1-meter high permeable rock berm across intermittent, seasonal stream that divides the existing marmot habitat to arrest gully
- Plant native shrubs and perennial plants in an approximately 25,000-square meter Mongolian marmot habitat restoration area
- Install Mongolian marmot warning and interpretive signs to be placed at the natural car parking facility

MCA-Mongolia will employ or contract an experienced biodiversity specialist to develop and implement the following Mongolian marmot construction-phase monitoring and long-term protection program

### **Construction-Phase Monitoring and Long-term Protection**

Prepare, submit, and implement Mongolian Marmot Monitoring and Evaluation Plan for the Engineer's written approval, to monitor and evaluate Mongolian marmot population density and structure, reproduction, and mortality in the vicinity of the proposed AWPP and replacement access road and pedestrian path to the Monument to Terror Victims, and existing and proposed walking trail to the sacred ovoo on Songinokhairkhan Mountain. The plan will specify roles and responsibilities for marmot monitoring and evaluation.

The plan may include but not be limited to the following, as determined by the biodiversity specialist and approved by the Engineer:

#### *Mapping*

- Burrow clusters
- Family and individual home ranges
- Vegetation
- BWSE-related and other human encroachment

#### *Monitoring activities*

- Use of drone equipped with thermal imaging camera
- Direct observation aided by binoculars and spotting scopes
- Use of automatic camera trap
- Capture with or without marking

#### *Monitoring parameters*

- Burrow cluster population
- Age of individuals
- Sex of individuals
- Home range size
- Number of families
- Family composition
- Number of pups
- Activity/Behavior
- Predation
- Survival and mortality
- Total population
- Age and sex distribution of population

Observations are to be repeated during the morning and evening active periods.

Monitoring data for the selected parameters will be evaluated as construction, and operation and maintenance progress for changes attributed to loss of marmot habitat or disturbance of marmots. The

monitoring and evaluation plan will specify impact indicators and impact criteria determined by the biodiversity specialist and approved by the Engineer.

Exceedance of any of the impact criteria will trigger, ***independent of this management measure***, preparing, submitting, and implementing protective actions, in addition to those specified above, formulated to avoid, minimize, or offset the observed adverse impact.

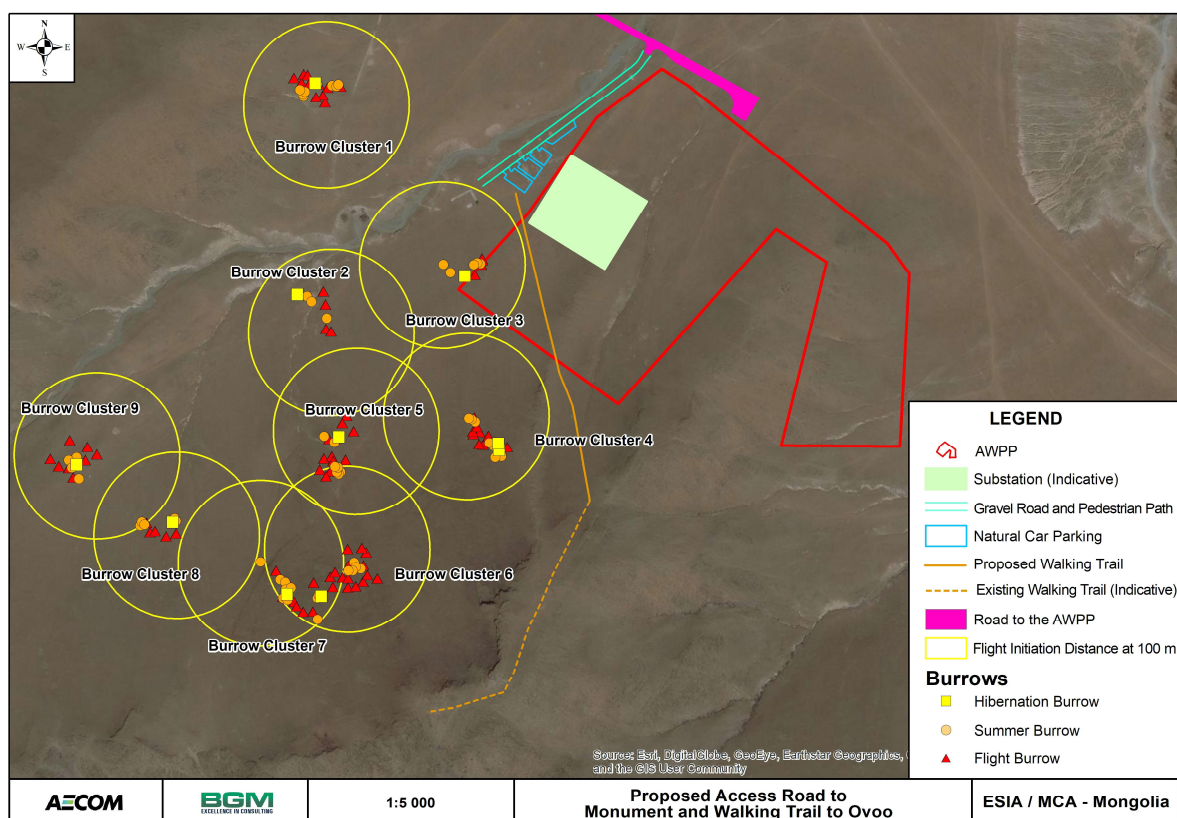
Such actions may include the following, as well as other measures recommended by the biodiversity specialist:

- Constructed buffers; e.g., vegetated earth berms
- Rock piles where marmots can watch for predators, thermoregulate, and dig burrows
- Spill protection measures
- Permanent Mongolian marmot protection zone
- Driving restrictions; e.g., prohibit or control off-road driving, set speed limits, restrict non-essential traffic to daytime
- Marmot protection and avoidance training
- Warning and interpretive signage
- Supplemental feeding to increase reproduction and survival, and attract marmots away from roads

The Contractor is/will be requested to provide a quotation to implement such actions identified by the biodiversity specialists, should the impact criteria be triggered

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the following figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults:



#### MONITORING

Document submission and approval of plan

<b>LOCATIONS:</b> Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoos on Songinokhairkhan Mountain, as located on the above figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults	
<b>INDICATORS AND SUCCESS CRITERIA:</b> <b>Indicators:</b> <ul style="list-style-type: none"> <li>• Development and implementation of protection and habitat restoration measures</li> <li>• Submission of construction-phase monitoring and long-term protection plan</li> <li>• Collection and evaluation of Mongolian marmot population density and structure, reproduction, and mortality data</li> <li>• Specific impact criteria and indicators specified in approved plan</li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Monitoring and protection plan approval</li> <li>• Identification of and timely response to changes attributed to loss of marmot habitat or disturbance of marmots</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of Construction-Phase Monitoring and Long-Term Protection Plan</li> <li>• Report monitoring activities and data evaluation findings</li> <li>• Report impact criteria exceedances and recommended protective actions to be implemented</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Annual, beginning prior to construction mobilization and continuing throughout construction, commissioning, and contract operations period Year 1 and Year 2</li> <li>• Late March to late September monitoring season, comprising four monitoring periods: <ul style="list-style-type: none"> <li>○ Late March/early April (post hibernation)</li> <li>○ Late June/early July (pups feeding outside burrows)</li> <li>○ Mid-August (newborn survival and mortality)</li> <li>○ Late September (pre hibernation)</li> </ul> </li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> MCA-Mongolia and Biodiversity specialist employed by or contracted to MCA-Mongolia, construction by Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Biodiversity specialist <i>Reporting:</i> Biodiversity specialist and Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## H.2.3 Waste Management

### Management Measure Conveyance - 8: Waste Management

POTENTIAL IMPACT
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hazardous and Toxic Chemicals <ul style="list-style-type: none"> <li>- Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>• Mongolian Law on Sanitation <ul style="list-style-type: none"> <li>- Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>- Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> <li>• Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste</li> <li>• Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).</li> <li>• Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes <ul style="list-style-type: none"> <li>- Requires providing personal protective equipment to the organization's waste management officer.</li> </ul> </li> <li>• Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste <ul style="list-style-type: none"> <li>- Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).</li> </ul> </li> <li>• IFC Performance Standards 3 and 4 <ul style="list-style-type: none"> <li>- Encourages recovering and reusing waste in a manner that is safe for human health and the environment.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>- Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes</li> </ul>
MANAGEMENT MEASURE
<p><b>Waste Management</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements: <ul style="list-style-type: none"> <li>○ Paragraph 1.04.E Hazardous Waste Management Plan</li> <li>○ Paragraph 1.14 Disposal of Excess Material</li> <li>○ Paragraph 1.21 Disposal of Debris</li> </ul> </li> <li>• Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures: <ul style="list-style-type: none"> <li>○ Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner</li> </ul> </li> </ul>

- Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated



<ul style="list-style-type: none"> <li>○ Wastes sent for off-site recycling</li> <li>○ Wastes subject to hazardous waste treatment</li> <li>○ Wastes subject to non-hazardous waste disposal</li> <li>○ Unrecyclable hazardous wastes stored</li> <li>• Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> </ul> <p>The Contractor will prepare and submit for the Engineer’s written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Contractor’s comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Assigns roles and responsibilities for waste management</li> <li>• Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>MONITORING</b></p>
<p>Document:</p> <ul style="list-style-type: none"> <li>• Provision, maintenance, and/or updating of: <ul style="list-style-type: none"> <li>○ MSDSs</li> <li>○ Secondary containment capacity for all storage of liquid hazardous materials</li> <li>○ Tanks and sumps inspection records</li> <li>○ Spill kits</li> <li>○ First aid</li> <li>○ Waste inventory</li> <li>○ Waste management training</li> </ul> </li> <li>• Submission and approval of site-specific Waste Management Plan</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Submission of site-specific Waste Management Plan</li> <li>• Volumes of waste generated</li> <li>• Volumes of waste sent for off-site recycling</li> <li>• Number of reported non-compliances with the controls identified in the plan</li> <li>• Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Number of reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Approval of site-specific Waste Management Plan</li> <li>• Minimize volume of waste generated</li> <li>• Maximize volume of waste sent for off-site recycling</li> <li>• Zero: <ul style="list-style-type: none"> <li>- Reported non-compliances with the controls identified in the plan</li> <li>- Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>- Reported waste incidents</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>- Number of waste related community complaints</li> <li>- Instances of off-site contamination identified</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>• Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Management measure and plan implementation throughout construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## H.2.4 Social and Gender Inclusion

### Management Measure Conveyance - 9: Labor Management

<b>POTENTIAL IMPACT</b>
Beneficial impacts to be enhanced: <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> Adverse impacts to be avoided or minimized: <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>

**STANDARD(S) / REQUIREMENT(S) TRIGGERED:**

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- Constitution of Mongolia
  - Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.
- Mongolian Civil Code
  - Requires providing office space, tools and equipment necessary to ensure employees' health.
- Mongolian Law on Gender Equality
  - Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.
- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction
- Mongolian Law on Minimum Wage
  - Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.
- Mongolian Law on the Protection of the Rights of the Child
  - Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children
- Mongolian Law on Social Protection of Disabled Persons
  - Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- Mongolian Law on Combating Human Trafficking
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to

<p>any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.</p> <ul style="list-style-type: none"> <li>- Prohibits employment of child labor.</li> <li>• Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>- Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.</li> </ul> </li> <li>• Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>- Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees</li> <li>- Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project</li> <li>- Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level</li> <li>- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>• Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment <ul style="list-style-type: none"> <li>- Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.</li> <li>• Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy</li> <li>- Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”</li> <li>• Ministry of Labor and Social Welfare Order (2016)</li> <li>- Expanded the types of hazardous work prohibited for children under the age of 18 to include construction</li> <li>• International Labor Organization fundamental conventions, and International Human Rights instruments and conventions</li> </ul> </li> </ul>
<p><b>OBJECTIVES</b></p>
<p>The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.</p> <ul style="list-style-type: none"> <li>• Promote fair treatment, non-discrimination, and equal opportunity of workers</li> <li>• Promote local labor opportunities and procurement from local suppliers</li> <li>• Target women’s employment as 30% of all labor at each skill/occupational level</li> <li>• Establish and maintain and improve a constructive worker-management relationship</li> <li>• Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain</li> <li>• Avoid the use of forced labor or trafficked labor</li> <li>• Maximize the beneficial impact of the project on the affected communities</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p>
<p><b>Labor Management</b></p> <p>The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:</p> <ul style="list-style-type: none"> <li>• Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs</li> <li>• Facilitate the Contractor’s cooperation with the local District Labor Offices</li> </ul>

- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

*Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth, and disadvantaged groups; 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's

Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university  
The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor’s Anti-Sexual Harassment Policy and notification of the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers’ Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a worker’s grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designate the Contractor’s Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor’s Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor’s zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor’s Social Safeguards Officer contact the MCA-Mongolia or its representative’s SST to include them in the investigation and appoint a



third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation

- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, and secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor’s responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor’s employment forecast and recruitment strategy, and the Contractor’s Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor’s Anti-sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation and abuse, and the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor’s TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative’s SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative’s SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative’s Social Manager

### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer’s written approval a site-specific Labor Management Plan that:

<ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct</li> <li>• Is consistent and compliant with: <ul style="list-style-type: none"> <li>○ Mongolian Law on Labor</li> <li>○ Relevant aspects of the Conditions of Contract, as well as the MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>○ The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>• Assigns roles and responsibilities for labor management</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Required plans written, approved, and implemented</li> <li>• Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>• Use of written contracts with defined pay scales by employment activity</li> <li>• Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> <li>• Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>• Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>• Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> </ul>

<ul style="list-style-type: none"> <li>Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor , such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships Internments established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>100% of employees and sub-contractors sign the Worker Code of Conduct</li> </ul> </li> <li>Resolution of 100% of internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p>

<i>Oversight:</i> MCA-Mongolia or its representative	<i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative
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### Management Measure Conveyance - 10: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2 <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>

## OBJECTIVES

The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.

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- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level
- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impact of the BWSE project on the project affected communities

## MANAGEMENT MEASURE

### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and district and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

#### *Community Engagement*

- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains
  - Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
  - Zero-tolerance of gender-based violence
  - Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan

#### *Expanding Short-term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in

project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.

- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships.
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with, secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc.

#### *Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### **MONITORING**

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities
- Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Employment recruitment activities
- Employment records of workers
- Number, dates, and locations of community engagement meetings
- Community related grievance redress actions and outcomes
- Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements



- Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements
- Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders

**Success Criteria:**

- 100% of required community meetings are held, with all topics covered
- Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category
- Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- Apprenticeships and internships established and completed for each construction season
- Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
- All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan
- Contracts and purchase orders with local business and service providers split including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)
  - Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)
  - Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses.

**REPORTING:**

- Reports on Gender Integration and Social Inclusion to be included in project monthly reports
- Summarize Gender Integration and Social Inclusion activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

**SCHEDULE**

**MANAGEMENT MEASURE:**

*Implementation:*

- Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction

**MONITORING:**

*Implementation:*

- Update recording of GSI activities and grievance redress actions as they occur

*Reporting:*

- Monthly in CESMP update

**RESPONSIBILITY**

**MANAGEMENT MEASURE:**

*Implementation:* Contractor

*Oversight:* Engineer

**MONITORING:**

*Implementation:* Contractor

*Reporting:* Contractor

*Oversight:* Engineer

## Management Measure Conveyance - 11: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>○ Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the foregoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>○ Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
MANAGEMENT MEASURE
Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged

incident of gender-based violence

- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be

communicated in Mongolian, in whole, to project-affected khoroo and District governments.
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p>

### *Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

### *Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

### *Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

### **REPORTING:**

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports
- Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern,
- Define activities planned during next reporting period

### **SCHEDULE**

#### **MANAGEMENT MEASURE:**

*Implementation:*

#### **MONITORING:**

*Implementation:*



<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

### Management Measure Conveyance - 12: Construction Camp and Temporary Facilities Management

<b>POTENTIAL IMPACT</b>
Risks and impacts that may be associated with workers' accommodation and workplace conditions
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Constitution of Mongolia             <ul style="list-style-type: none"> <li>- Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code             <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.</li> </ul> </li> <li>• Mongolian Labor Code             <ul style="list-style-type: none"> <li>- Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene             <ul style="list-style-type: none"> <li>- Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.</li> </ul> </li> <li>• Mongolian Law of Fire Safety             <ul style="list-style-type: none"> <li>- Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.</li> </ul> </li> <li>• Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33             <ul style="list-style-type: none"> <li>- Prohibits precluding to conclude a contract of legal entities and organizations.</li> </ul> </li> <li>• IFC Performance Standards 2 and 4             <ul style="list-style-type: none"> <li>- Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking             <ul style="list-style-type: none"> <li>- Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC and EBRD (2009) guidance at Workers' Accommodation: Processes and Standards<sup>1</sup> <ul style="list-style-type: none"> <li>- Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning             <ul style="list-style-type: none"> <li>- Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>

- Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.

#### MANAGEMENT MEASURE

##### Construction Camp and Temporary Facilities Management

The Contractor will:

- Fully comply with the requirements of this management measure
- Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment
- Ensure compliance with IFC and EBRD (2009) guidance at *Workers' Accommodation: Processes and Standard* for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.
- Ensure compliance with IFC and EBRD guidance at *Workers' Accommodation: Processes and Standards* for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.
- Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at *Workers' Accommodation: Processes and Standards*
- Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality
- Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work
- Provide all accommodation sites with sufficient supplies and services
- Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition
- Conduct visual checks on site to ensure proper housekeeping
- Ensure suitable first aid equipment is kept on site, at various appropriate locations
- Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required
- Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies
- Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on:
  - Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan
  - General waste management, housekeeping, first aid practices, and communicable diseases
- Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Assigns roles and responsibilities for construction camp and temporary facilities management

#### LOCATIONS:

All areas within and immediately surrounding construction camps and other temporary facilities

#### MONITORING

Document:

- Implementation of the above provisions
- Training

<ul style="list-style-type: none"> <li>Submission and approval of plan</li> </ul>	
<b>LOCATIONS:</b> All areas within and immediately surrounding construction camps and other temporary facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b> Indicators: <ul style="list-style-type: none"> <li>Implementation of the above provisions</li> <li>Training sessions</li> <li>Submission of plan</li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>Plan approval</li> <li>Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and annually thereafter</li> <li>Implementation of above provisions throughout construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training</li> <li>Document implementation of above provisions</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure Conveyance - 13: Cultural Heritage Protection

<b>POTENTIAL IMPACT</b>
<ul style="list-style-type: none"> <li>Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> <li>Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> <li>Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Mongolian Law on Protection of Cultural Heritage</li> </ul>

<ul style="list-style-type: none"> <li>- If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>- Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protection the intangible cultural heritage.</li> <li>• IFC Performance Standard 8</li> <li>- Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> <li>- Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Protect tangible cultural heritage from inadvertent excavation or damage</li> <li>• Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Cultural Heritage Protection</b></p> <p><b>Chance Find Procedure</b></p> <p>As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.</p> <p>Should any unexpected tangible cultural heritage be discovered:</p> <ul style="list-style-type: none"> <li>• Cease all work in the immediate area and do not disturb the chance find further, including: <ul style="list-style-type: none"> <li>- Establishing a 30-meter buffer around the chance find</li> <li>- Leaving buffer undisturbed until competent cultural heritage specialist assesses the site</li> <li>- Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.</li> </ul> </li> <li>• Work many continue at other locations providing there is a buffer zone between the chance find area and the construction area</li> <li>• Immediately notify the Engineer and the concerned government agencies, specifically the: <ul style="list-style-type: none"> <li>- Office of the governor of the capital city</li> <li>- Office of governor of the respective Khan-Uul District or Songinokhairkhan District</li> <li>- Local police</li> <li>- Institute of Archeology, Mongolian Academy of Sciences</li> <li>- Institute of History and Ethnography, Mongolian Academy of Sciences</li> </ul> </li> <li>• Provide the following information to the Engineer and government agencies: <ul style="list-style-type: none"> <li>- Cultural heritage site type—description and photograph(s)</li> <li>- Location—description and GPS coordinates</li> <li>- Date, time, and details of find</li> <li>- Nature of work that led to exposure of or locating the find</li> </ul> </li> <li>• Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation</li> <li>• Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage</li> <li>• Restart work only upon written direction from the Engineer</li> </ul> <p><b>Cultural and Sacred Landscape and Places</b></p> <ul style="list-style-type: none"> <li>• SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.</li> <li>• Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious,</li> </ul>

and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

### **Training**

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

- Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum:
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities
  - Assigns roles and responsibilities for training
- Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.

#### **LOCATIONS:**

- All work sites
- Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred

### **MONITORING**

Monitor throughout construction

#### *Chance Find Procedure*

- Construction work sites during excavation or other ground disturbance

#### *Cultural and Sacred Landscape and Places*

- Communications SST Community Liaison Officers and Engineer
- Written directions of Engineer
- Actions to accommodate spiritual, religious, and traditional ceremonies and rituals
- Performance of spiritual, religious, and traditional ceremonies and rituals

#### *Training*

- Document submission and approval of training plan
- Document training of personnel as specified in approved plan

#### **LOCATIONS:**

- All work sites

#### **INDICATORS AND SUCCESS CRITERIA:**

Indicators:

#### *Chance Find Procedure*

- Chance find of tangible cultural heritage
- Excavation or damage of tangible cultural heritage
- Cease work decision
- Protection of chance find area and tangible cultural heritage

#### *Cultural and Sacred Landscape and Places*

- Performance of spiritual, religious, and traditional ceremonies and rituals

#### *Training*

- Submission of training plan
- Date and location of training sessions, or as specified in approved plan

<ul style="list-style-type: none"> <li>Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Training plan approval</li> <li>All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>	
<p><b>REPORTING:</b></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>Report chance find and cease work decision</li> <li>Report excavation or damage of tangible cultural heritage</li> <li>Report actions to protect chance find area and tangible cultural heritage</li> <li>Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>Report communications with SST Community Liaison Officers and Engineer</li> <li>Report directions of Engineer</li> <li>Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> <li>Continuous during excavation or other ground disturbance</li> </ul> <p>Cultural and Sacred Landscape and Places</p> <ul style="list-style-type: none"> <li>As required, periodically throughout project construction</li> </ul> <p>Training</p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Personnel training in accordance with timing and frequency specified in approved plan; at minimum, once at beginning of each construction season</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>Document communications with SST Community Liaison Officers and the Engineer, and written directions of Engineer as they occur</li> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training sessions and personnel start, training, and field</li> </ul>



	deployment as the occur, or as specified in approved plan <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## H.2.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure Conveyance - 5: Emergency Preparedness and Response
- Management Measure Conveyance - 8: Waste Management
- Management Measure Conveyance – 10: Gender Integration and Social Inclusion (GSI)
- Management Measure Conveyance – 11: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Conveyance - 12: Construction Camp and Temporary Facilities Management

### Management Measure Conveyance - 14: Health and Safety Management

<b>POTENTIAL IMPACT</b>
Health and safety risks and impacts on work sites and in construction camps, and in the community
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>- Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>- Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>• IFC Performance Standard 4 <ul style="list-style-type: none"> <li>- Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>- Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>- Provides guidance on occupational health and safety and community health and safety.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Identify, assess, manage, and record and communicate all health and safety hazards, and ensure:</li> <li>- Resulting risks to people, property, assets, and the environment are evaluated</li> </ul>

- Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical
- Any requirements to mitigate risks are implemented
- Risks and actions to manage them are reported and communicated

## MANAGEMENT MEASURE

### Health and Safety Management

The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.

The Contractor will:

- Fully comply with the requirements of this management measure
- Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup>
- Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to:
  - Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan
  - Section 01046 Control of Work, Paragraph 3.05 Open Excavations
  - Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets
  - Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control
  - Protect drinking water sources, whether public or private, at all times
- Prepare and implement a traffic control plan for accessing the site, approved by Engineer
- Implement all reasonable precautions to protect the health and safety of workers
- Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers
- Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities
- Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident
- Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities
- Avoid or minimize traffic accidents and promote traffic safety by all project personnel
- Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials
- Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures
- Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice
- Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project

<ul style="list-style-type: none"> <li>Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply</li> <li>Specifies: <ul style="list-style-type: none"> <li>Site security, including securing of excavations, hazardous materials, etc.</li> <li>Confined space safety procedures</li> <li>Excavation and trenching safety measures</li> <li>First aid facilities, equipment, and materials</li> <li>Protective clothing and safety equipment</li> <li>HIV/AIDS awareness program</li> <li>Covid-19 awareness program</li> <li>Counter-trafficking in persons program</li> <li>Health and Safety management monitoring and reporting</li> </ul> </li> <li>Assigns roles and responsibilities for health and safety management</li> </ul>	
<b>LOCATIONS:</b> All project sites and surrounding communities	
<b>MONITORING</b>	
Document submission and approval of plan	
<b>LOCATIONS:</b> All project sites and surrounding communities	
<b>INDICATORS AND SUCCESS CRITERIA:</b> Indicators: <ul style="list-style-type: none"> <li>Submission of plan</li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>Plan approval</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## H.2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure Conveyance - 5: Emergency Preparedness and Response
- Management Measure Conveyance - 7: Mongolian Marmot Protection and Habitat Restoration
- Management Measure Conveyance - 8: Waste Management
- Management Measure Conveyance - 9: Labor Management
- Management Measure Conveyance - 10: Gender Integration and Social Inclusion (GSI)
- Management Measure Conveyance - 11: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Conveyance - 12: Construction Camp and Temporary Facilities Management
- Management Measure Conveyance - 13: Cultural Heritage Protection
- Management Measure Conveyance - 14: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure Conveyance - 15: Stakeholder Engagement, Community Consultation, and Grievance Redress

POTENTIAL IMPACT
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> </ul>

- Foster positive relations and effective partnerships with local communities throughout project construction and operation
- Maximize the beneficial impact of the BWSE project on the affected communities

#### MANAGEMENT MEASURE

#### Stakeholder Engagement, Community Consultation, and Grievance Redress

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

##### Stakeholder Engagement

- The Contractor will:
  - Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework
  - Maintain, revise, and update the project Stakeholder Engagement Matrix
  - Document all stakeholder engagement activities in the Stakeholder Engagement Matrix:

##### Community Consultation

- The MCA-Mongolia or its representative will
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with the MCA-Mongolia or its representative, the Contractor will
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the MCA- Mongolia Grievance Redress Mechanism, and other issues that arise during consultation
  - Document all community consultation activities in the Stakeholder Engagement Matrix

##### Grievance Redress

- The MCA-Mongolia or its representative will supervise, and monitor participation by all parties
- The Contractor will:
  - Implement the Grievance Redress Mechanism consistent with Annex A of this ESMP
  - Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism
  - Document all grievance redress actions in the Stakeholder Engagement Matrix
  - Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer

#### LOCATIONS:

All construction sites and temporary construction facilities

#### MONITORING

##### MCA-Mongolia or its representative

- Monitor Contractor contacts with stakeholders and communities
- Monitor participation by all parties in Grievance Redress Mechanism

##### Contractor

- Document all stakeholder engagement activities
- Document all community consultation activities
- Record results of Contractor's community consultation activities

<ul style="list-style-type: none"> <li>Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>	
<b>LOCATIONS:</b> All construction sites and temporary construction facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b> Indicators: <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> </ul> </li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## H.2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## H.2.8 Monitoring and Verification, and Maintenance Actions



This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## H.3 Implementation Work Plan and Schedule

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.

## H.4 Implementation Budget

Implementation, including monitoring, of the ESMP management measures, with one exception, do not entail a marginal cost. Costs are reflected in MCA-Mongolia or its representative's operating costs, the Contractor's construction contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The cost of obtaining all required permits are deemed to be included in the Contractor's contract budget for operations and procedures or the Operator's budget for operation and maintenance.

The costs of implementing ESMP management measures are primarily driven by staff costs. Other costs are associated with development of policies and plans, training, and equipment.

## MCA-Mongolia or Its Representative's Costs

Staff Costs				
<i>Role</i>	<i>Cost</i>	<i>Unit</i>	<i>Total</i>	<i>Assumption</i>
<b>Environmental and Social Manager</b>	-	salary	-	Covered in Section F.6
<b>Waste Management Manager</b>	-	salary	-	Covered in Section F.6
<b>HSE Manager</b>	-	salary	-	Covered in Section F.6
<b>Social Manager</b>	-	salary	-	Covered in Section F.6
<b>Social Safeguards Officers</b>	-	salary	-	Covered in Section F.6
<b>Community Liaison Officers</b>	-	salary	-	Covered in Section F.6
<b>Staff Costs Total</b>			-	

Marmot Monitoring Costs				
<i>Description</i>	<i>Cost</i>	<i>Unit</i>	<i>Total</i>	<i>Assumption</i>
<b>Binoculars</b>	-	each	-	Covered in Section G.6
<b>GPS</b>	-	each	-	Covered in Section G.6
<b>Camera</b>	-	each	-	Covered in Section G.6
<b>Car rental</b>	-	per day	-	Covered in Section G.6
<b>Experts in field</b>	-	per day	-	Covered in Section G.6
<b>Reporting on each mission</b>	-	per day	-	Covered in Section G.6
<b>Marmot Monitoring Costs Total</b>			-	

## Contractor Costs

CP-3 Staffing Requirements			
<b>Total staff on CP-3 contract</b>	200	staff	Assumed
<b>HR Team</b>	5	staff	Manager + 1 HR staff/50 employees
<b>HSE Team</b>	5	staff	Manager + 1 HSE staff/50 employees
<b>Social Safeguards Officer</b>	4	staff	4 officers for CP-3
<b>Construction Camp Management Team</b>	3	staff	Manager + 1 support staff/100 employees
<b>Expected duration of Construction</b>	29	months	Estimated

ESMP Management Measures Cost Estimate:

<b>Staff Costs</b>				
<b>Role</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
HR Manager	\$ 2,000.00	salary	\$ 58,000.00	5.0 million MNT/month + benefits
HR staff	\$ 1,000.00	salary	\$ 116,000.00	2.5 million MNT/month + benefits
HSE Manager	\$ 2,000.00	salary	\$ 58,000.00	5.0 million MNT/month + benefits
HSE staff	\$ 1,000.00	salary	\$ 116,000.00	2.5 million MNT/month + benefits
Social Safeguards Officers	\$ 1,000.00	salary	\$ 116,000.00	2.5 million MNT/month + benefits
Construction Camp Manager	\$ 2,000.00	salary	\$ 58,000.00	5.0 million MNT/month + benefits
Construction Camp Management Team	\$ 1,000.00	salary	\$ 58,000.00	2.5 million MNT/month + benefits
Staff Costs Subtotal			\$ 580,000.00	
<b>Costs of HR Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 10,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 1,500.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 3,625.00	1 per HR staff per month
Vehicles	\$ 100.00	per day	\$ -	no project vehicles for HR staff (office job)
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 7,250.00	stationary and petty expenses per month
HR Office Costs Subtotal			\$ 23,375.00	
<b>Costs of HSE Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 10,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 1,500.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 3,625.00	1 per HR staff per month
Vehicles	\$ 50,000.00	per day	\$ 150,000.00	1 project vehicle purchased per 2 HSE staff
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 7,250.00	stationary and petty expenses per month

PPE for visitors and spares	\$ 100.00	per set	\$ 6,000.00	20 sets for visitors + enough for 20% of staff requirements as spares.
HR Office Costs Subtotal			\$ 179,375.00	
<b>Costs of SSO Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 8,000.00	1 per HR staff
Mobile phone	\$ 300.00	each	\$ 1,200.00	1 per HR staff
Monthly phone plan	\$ 25.00	each	\$ 2,900.00	1 per HR staff per month
Vehicles	\$ 50,000.00	per day	\$ 100,000.00	1 project vehicle per 2 SSOs
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 250.00	per month	\$ 7,250.00	stationary and petty expenses per month
Regular Community Liaison	\$ 60.00	per day	\$ 8,700.00	Stakeholder and community liaison 5 days per month
Community Town Hall and Training	\$ 500.00	per day	\$ 14,500.00	once per month (in suitable venue with refreshments)
HR Office Costs Subtotal			\$ 143,550.00	
<b>Plan and Policy Development Costs</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Labor Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR Expert, 5 days @ \$500/day
Gender Integration and Social Inclusion Plan	\$ 2,500.00	each	\$ 2,500.00	GSI Expert, 5 days @ \$500/day
CTIP Plan	\$ 1,000.00	each	\$ 1,000.00	Expert, 2 days @ \$500/day
Code of Conduct	\$ 2,500.00	each	\$ 2,500.00	Psychologist/HR expert, 5 days @ \$500/day
Stakeholder Engagement Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Grievance Redress Mechanism (GRM)	\$ 2,000.00	each	\$ 2,000.00	Expert, 4 days @ \$500/day
Health and Safety Management Plan	\$ 2,500.00	each	\$ 2,500.00	HSE Expert, 5 days @ \$500/day
Covid-19 Prevention Plan	\$ 500.00	each	\$ 500.00	Expert, 1 days @ \$500/day

Emergency Preparedness and Response Plan	\$ 1,000.00	each	\$ 1,000.00	HSE Expert, 2 days @ \$500/day
Waste Management Plan (WMP)	\$ 1,000.00	each	\$ 1,000.00	Expert for 2 days @ \$500/day
Construction Camp and Temporary Facilities Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR/HSE Experts, 5 days @ \$500/day
Training Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Plan and Policy Development Costs Subtotal			\$ 23,000.00	
<b>Training Costs</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
HR Policy Training	\$ 500.00	coach/day	\$ 3,000.00	2 day course for HR staff once a year @ \$500/day
Code of Conduct Training	\$ 500.00	coach/day	\$ 30,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Staff Training	\$ 500.00	coach/day	\$ 3,000.00	2 day course for HSE staff once a year @ \$500/day
HSE Training	\$ 500.00	coach/day	\$ 30,000.00	1 training per year for all staff, full day, groups of ten (\$500/day for coach)
HSE Orientation for visitors	\$ -	as necessary	\$ -	Included of HSE staff duties
First Aid training	\$ 500.00	coach/day	\$ 1,000.00	1 training per year for first aid volunteer staff (~10% of staff), full day, groups of ten max. (\$500/day for coach)
Emergency Preparedness and Response Training - HSE Staff	\$ 500.00	coach/day	\$ 1,500.00	1 day course for HSE staff once a year @ \$500/day
Emergency Preparedness and Response Training - all staff	\$ -	per employee	\$ -	Included in HSE training
ESMP Implementation Training Plan	\$ -	per employee	\$ -	Included in HSE training
WMP Training	\$ -	per employee	\$ -	Included in HSE training

Tangible Cultural Heritage Protection Training	\$ -	per employee	\$ -	Included in HSE training
Biodiversity Training	\$ -	per employee	\$ -	Included in HSE training
CTIP Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
CTIP Orientation for subcontractors and service providers	\$ -	per employee	\$ -	Included in HSE Orientation
Anti-Sexual Harassment and Discrimination Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
On-job training, apprenticeships, internships	\$ -	as required	\$ -	Included in staff costs (as per Labor Management Plan)
Community training in HSE, CTIP	\$ -	as required	\$ -	Included in Community Liaison (SSO )
Training Costs subtotal			\$ 68,500.00	

#### Equipment and Other Costs

<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
PPE equipment (hard hat, boots, hi-vis clothing, glasses, gloves)	\$ 100.00	per employee	\$ 60,000.00	PPE provided to all employees each year
First aid kits	\$ 100.00	each	\$ 2,000.00	1 kit per 10 employees
Emergency Response Plan Dissemination	\$ 2,500.00	overall	\$ 2,500.00	Posters, brochures, etc. at site/ camp indicating emergency procedures and phone numbers
Spill protection equipment	\$ 2,500.00	overall	\$ 2,500.00	Spill sheets for all vehicles, regularly changed.
GRM implementation	\$ -	per year	\$ -	Implementation of the GRM by HR staff/Social Safeguards Officer
Contract with Landfill for inert waste	\$ -	per year	\$ -	Covered in cost of construction operations
Contract with Hazardous waste company	\$ -	per year	\$ -	Covered in cost of construction operations
Bins at construction camp	\$ -	each	\$ -	Covered in cost of construction camp



Cultural Heritage - protection of known sites	\$ -	each	\$ -	Covered in cost of construction operations
Cultural Heritage - chance find	\$ 6,000.00	each	\$ 6,000.00	Assume one chance find at AWPP site - site has already been survey by archeologists and paleontologists.
Biodiversity Monitoring Equipment	\$ 1,380.00	all	\$ 1,380.00	Binoculars, Camera, GPS
Equipment and Other Costs Subtotal			\$ 74,380.00	
<b>PPE equipment (hard hat, boots, hi-vis clothing, glasses, gloves)</b>	\$ 100.00	per employee	\$ 60,000.00	PPE provided to all employees each year
<b>First aid kits</b>	\$ 100.00	each	\$ 2,000.00	1 kit per 10 employees
<b>Emergency Response Plan Dissemination</b>	\$ 2,500.00	overall	\$ 2,500.00	Posters, brochures, etc. at site/camp indicating emergency procedures and phone numbers
<b>Spill protection equipment</b>	\$ 2,500.00	overall	\$ 2,500.00	Spill sheets for all vehicles, regularly changed.
<b>GRM implementation</b>	\$ -	per year	\$ -	Implementation of the GRM by HR staff/Social Safeguards Officer
<b>Contract with Landfill for inert waste</b>	\$ -	per year	\$ -	Covered in cost of construction operations
<b>Contract with Hazardous waste company</b>	\$ -	per year	\$ -	Covered in cost of construction operations
<b>Bins at construction camp</b>	\$ -	each	\$ -	Covered in cost of construction camp
<b>Cultural Heritage - protection of known sites</b>	\$ -	each	\$ -	Covered in cost of construction operations
<b>Cultural Heritage - chance find</b>	\$ 6,000.00	each	\$ 12,000.00	Assume two chance finds on pipelines site - site has already been survey by archeologists and paleontologists but it is extensive.
<b>Biodiversity Monitoring Equipment</b>	\$ 1,380.00	all	\$ 1,380.00	Binoculars, Camera, GPS

<b>Marmot avoidance and mitigation - earth barrier between critical habitat and AWPP site</b>	\$ 5.00	cubic meter	\$ 20,000.00	H:2 m; L: 500 m; V: 4,000 m <sup>3</sup> @ USD5/m <sup>3</sup> all inclusive
<b>Marmot avoidance and mitigation - shrubs for habitat restoration</b>	\$ 4.00	each	\$ 1,600.00	400 shrubs at USD 4.00 per shrub including labor
<b>Marmot avoidance and mitigation - rock dam for habitat protection.</b>	\$ 5.00	cubic meter	\$ 500.00	100 m <sup>3</sup> of material @ USD5/m <sup>3</sup> all inclusive
<b>Relocation of Trees - Truck</b>	\$ 85.00	per day	\$ 1,700.00	2 trucks for 10 days
<b>Relocation of Trees - Forklift Fly Jib Crane</b>	\$ 150.00	per day	\$ 1,500.00	1 Crane for 10 days
<b>Relocation of Trees - Operator for Forklift Fly Jib Crane</b>	\$ 60	per day	\$ 600	1 Crane operator for 10 days
<b>Relocation of Trees - Staff</b>	\$ 50	per day	\$ 2,000	4 staff for 10 days
<b>Relocation of Trees - Trees</b>	\$ 30	each	\$ 2,400	Replacement of damaged trees (20 % of total)
<b>Equipment and Other Costs Subtotal</b>			<b>\$ 110,680.00</b>	
<b>ESMP Management Measures Costs Total</b>			<b>\$ 1,128,480.00</b>	

## H. Annex A - Grievance Resolution Mechanism

The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>83</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

5. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
6. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>84</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>85</sup> References available upon request to MCA.

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<sup>83</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>84</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>85</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017

The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.

- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

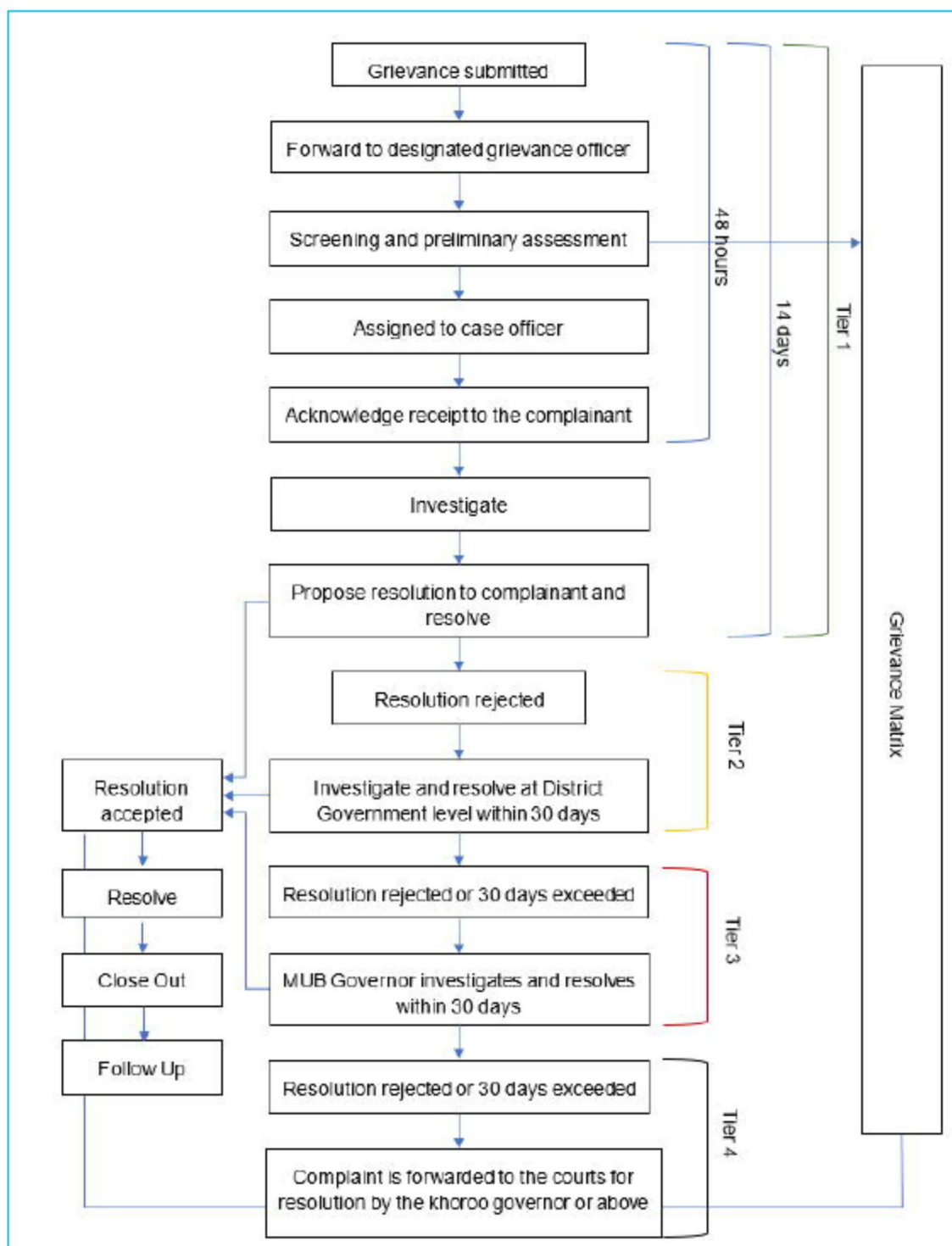
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM





## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contract and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external

investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both an MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.

## **H. Annex B - Public Consultation and Stakeholder Engagement Plan for BWSE**

### **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

### **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

19. Staffing and resources
20. Stakeholder Identification and Analysis
21. Information Disclosure
22. Stakeholder Consultation
23. Partnerships
24. Grievance Management
25. Stakeholder Involvement in Project Monitoring
26. Reporting to Stakeholders
27. Management Functions

## **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social license to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc., filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

## **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

## **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions

6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

9. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
10. Observations by affected parties, triangulated to strengthen validation,
11. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
12. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen



support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

13. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
14. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
15. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
16. Make monitoring results publicly available, especially reports of any external monitors.
17. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
18. Derive an SOP for reporting to stakeholders.

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## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

15. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
16. The hiring and training of community liaison officers
17. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
18. Input and suggestions received from stakeholders on project design and proposed mitigation measures
19. Grievance mechanisms that capture and respond to stakeholder concerns
20. The involvement of local stakeholders in project monitoring
21. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals

- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field- level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes –stakeholder relations becomes a collective responsibility.

## Appendix I ESMP – Operations and Maintenance

This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts, during the operations and maintenance of BWSE facilities and assets, comprising the structures and infrastructure constructed under contract packages CP-1: Production Well Drilling, Construction, Development, and Acceptance Testing, CP\_2: Advanced Water Purification Plant (AWPP), and CP-3: Raw and Finished Water Conveyance. The operations and maintenance of the BWSE facilities will be carried by Water Service Provider of Ulaanbaatar, USUG, who will receive ownership of the BWSE facilities after contract Taking Over Certificates are issued. This ESMP is aligned with the ESMPs developed for the pre-construction and construction phases and is consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>86</sup>

Management measures are specified for the Operation and Maintenance phase of the BWSE project facilities. It is recognized that the legal mechanism requiring USUG to implement these measures is not defined; however, it is expected that they will provide a starting point, along with the training and assistance will receive during Test to Completion and Defect Notification Period, for USUG to develop, tailor or adapt adequate management measures for implementation by their staff during the operations and management phase of the BWSE project.

As discussed in Sections 3.2 and 5.2 of the BWSE environmental and social impact assessment (ESIA), the ESIA team eliminated decommissioning from detailed study. Because UB always will require water and therefore a bulk water system, effectively the useful life of the project will not end, and the system will not be decommissioned. Rather, when needed, the bulk water system will be reengineered and reconstructed to upgrade specific processes and equipment. These activities would be undertaken inherent to the operation and maintenance phase and in accordance with the design standards, and environmental procedures and regulations current at that time. Therefore, management measures are not specified for a decommissioning phase. Nonetheless, this ESMP presents a discussion of the process of and risks associated with decommissioning, albeit a necessarily general discussion as decommissioning activities are not known at this stage and the BWSE infrastructure and project sites are highly varied.

For each management measure the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient

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<sup>86</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight
- Estimated Costs – Potential costs of implementing the management measure and monitoring to assist Operator in preparing for and implementing Management Measures

The management measures and monitoring specified in this ESMP should be implemented, as applicable, together with the conditions, procedures, and best operational practices specified during operations training of BWSE facilities and Operations and Maintenance Manuals. For purposes of the ESMP, best operational practices and management measures are distinguished as follows:

- *Best operational practices* are actions typically taken by the operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best operational practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best operational practices are inherently part of good operations of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the operations and maintenance phase, they are practices that typically are within the scope of services of the operator performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

It is expected that best operational practices are, in part, already intrinsic in USUG's *modus operandi* and will be further developed and informed during specific training imparted to USUG staff by Contractor appointed experts prior to and during the Defects Notification Period, which will continue for one year after USUG formally take over operations of the BWSE facilities.

## I.1 Responsibilities During Operation and Maintenance

### Operator

Ulaanbaatar Water and Sewer Authority (USUG), as the **Operator** of all the water supply assets furnished by the construction contract, will be fully responsible for implementing and monitoring the operation and maintenance-related management measures specified in the ESMP. It is recommended that the Operator read the ESMP, consider it in its entirety, and adapt with all aspects of the ESMP that pertain to implementing and monitoring operation and maintenance-related environmental and social management.

The Operator should act responsibly to provide notification of the Operator's schedule to enable the Authority to carry out its responsibilities.

### Authority

USUG, as the **Authority**, should be responsible for oversight of the operation and maintenance-related management measures and monitoring specified in the ESMP. In this self-policing capacity, the Authority should fully consider the standards and regulations of the appropriate government agency with respect to each management measure and would self-disclose violations of laws to the respective agency.

It is advised that the Authority establish a Social Safeguards Team (SST), led by a Social Manager, if they do not have an equivalent body already, that during the operation and maintenance phase, in coordination with the Operator, will coordinate with community representatives and liaisons, and project affected persons in implementing, supervising, reporting, and follow-up actions with regard to the ESMP. The organization, staffing, and responsibilities of the Authority SST could be comparable to that of the MCA-Mongolia or its representative's SST, for example, as described for the pre-construction phases of Appendices F, G and H of the ESIA.

## I.2 Environmental Management

### Management Measure O&M -1: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during operations and maintenance and risk jeopardizing worker and public health and safety, and the environment
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>○ Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>○ Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>○ Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>○ Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>○ Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> </ul> </li> <li>• Mongolian Criminal Code <ul style="list-style-type: none"> <li>○ Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> </ul> </li> <li>• IFC Performance Standards 1, 3, and 4 <ul style="list-style-type: none"> <li>○ Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>○ Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
MANAGEMENT MEASURE
<b>Emergency Preparedness and Response</b>



The Operator will:

- Fully comply with the requirements of this management measure
- Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Operator's site-specific Emergency Preparedness and Response Plan, to all employees and contractors at the time of their induction and annually thereafter
- Prepare and submit for the Authority's written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Operator will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.

#### **Hazardous Materials Management**

- Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials
- Develop prioritized material-specific handling procedures and training requirements as necessary according to risk
- Assign an officer to manage and advise on hazardous materials management

##### *Handling*

- Nominate all equipment used to transfer hazardous materials for approval by the Authority to assess that control measures are sufficient
- Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities
- Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)
- Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells

##### *Transport*

- Nominate all haulers used to transport hazardous materials for approval by the Authority to assess that they are appropriately qualified to transport and handle hazardous materials
- Nominate all containers used to transport hazardous materials for approval by the Authority to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

##### *Storage Equipment*

- Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities
- Locate suitable fire-fighting equipment, emergency equipment, and first aid kits in appropriate locations close to hazardous material storage areas
- Do not use and take out of commission damaged containers that present a risk of leakage
- Maintain an inventory hazardous materials held or generated, detailing the following:
  - Provisions of respective MSDSs
  - Segregation of potentially reactive materials
  - Measures in place to mitigate potential hazards to humans and the environment posed by inventoried hazardous materials
- Maintain at all times at hazardous material storage areas record books specifying the types, classifications, names, and quantities of stored substances

##### *Storage Area Design*

- Prepare and submit for the Authority's written approval site-specific designs of storage areas to store the types and quantities of hazardous materials required, specifying, but not limited to:
  - Facility location sufficiently distant from accommodation and work areas as determined by risk assessment
  - Access control to storage areas, where appropriate
  - Provision of sufficient space to enable safe access and handling of containers
  - Provision of 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
  - Walls, dykes, and/or berms to separate incompatible materials
  - Adequate ventilation of volatile hazardous material storage areas to prevent the build-up of explosive or harmful airborne pollutants
  - Fire prevention systems appropriate and adequate to the materials being stored, in accordance with storage facility risk assessment
  - Prevention and containment of contamination of the environment, particularly soil, surface water, and groundwater
  - Directing of surface runoff and stormwater drainage from material storage areas through a drainage system to oil/water separators and sediment traps

#### *Operational Requirements*

- Restrict access to hazardous waste storage areas to authorized personnel only
- Minimize as far as possible the overall volume of hazardous materials used, purchased, and present on site, through careful material selection, stock control, and materials inventory
- Ensure adequate storage capacity is available through stock control
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
- Record findings of inspections
- Repair any cracks or holes
- Record any repairs conducted
- Store incompatible materials (e.g., bases and acids) in a safe manner and at a safe distance to prevent accidents, as determined through risk assessment, through:
  - Not storing incompatible materials in the same container
  - Segregating incompatible materials by appropriate means, including, but not limited to segregating by area, walls, dykes, berms, or in separate facilities
- Maintain the capacity and functionality of bunds at all times as part of periodic inspections
- Consider water removed from containment areas to be contaminated waste and treat accordingly
- In accordance with risk assessment for hazardous material storage areas:
  - Restrict ignition sources, including prohibiting smoking
  - Develop and execute appropriate fire prevention and management practices
- Properly mark, label, placard, and secure containers and storage areas in accordance with the MSDS provided in Mongolian, English, and any other languages as appropriate
- Store containers on pallets within bunds, or other suitable storage structures

#### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff

#### **Spill Response Procedure**

- Operator employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Authority.

#### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.
- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, contractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Authority of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Authority.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.

- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Authority.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Authority.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Authority.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Authority.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

### **Emergency Preparedness and Response Plan**

- Prepare and submit for the Authority's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:
  - Affirms and executes the Operator's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan
  - Specifies:
    - Site-specific preventive measures and response strategies the Operator will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment
    - Potential emergencies and key areas prone to emergency situations
    - Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.
    - Actions to be taken prior to an emergency—i.e., preventive and preparatory measures
    - Actions to be taken during an emergency—i.e., response measures
    - Actions to be taken after an emergency—i.e., recovery and assessment measures
    - Contact lists for emergency situations
    - Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas
  - Assigns roles and responsibilities for emergency preparedness and response
- Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities

<ul style="list-style-type: none"> <li>In case of any accidents, the Operator will immediately undertake the procedures contained within the Plan</li> </ul>	
<b>LOCATIONS:</b> All BWSE sites facilities	
<b>MONITORING</b>	
Document submission and approval of plan	
<b>LOCATIONS:</b> All BWSE sites and facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b> Indicators: <ul style="list-style-type: none"> <li>Submission of plan</li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>Plan approval</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Report communications and written approval of Authority of site-specific Emergency Preparedness and Response Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Authority approval prior to starting any construction activities</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Authority as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Operator <i>Oversight:</i> Authority	<b>MONITORING:</b> <i>Implementation:</i> Operator <i>Reporting:</i> Operator <i>Oversight:</i> Authority

### Management Measure O&M - 2: Mongolian Marmot Protection

<b>POTENTIAL IMPACT</b>
Disturbance of endangered Mongolia marmot ( <i>Marmota sibirica</i> ) and disturbance of marmot habitat
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires researching and establishing the potential for State and regional development, the restoration, breeding and raising of endangered animals, protection of soil, water, and air, and for humans to live in a healthy.</li> </ul> </li> <li>Mongolian Law on Fauna               <ul style="list-style-type: none"> <li>Requires the approval of the government based on the conclusions of an environmental impact assessment of the construction of industrial plants, power stations within the territory of extremely rare fauna.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Prohibits implementing any activities that leads to a net reduction in the national/regional population of any Critically Endangered or Endangered species over a reasonable period.</li> </ul> </li> </ul>

OBJECTIVES
<ul style="list-style-type: none"> <li>Minimize disturbance of Mongolian marmots</li> </ul>
MANAGEMENT MEASURE
<p><b>Mongolian Marmot Protection</b></p> <p><b>Protection and Habitat Restoration</b></p> <p>The Authority will, with reference to the figure below:</p> <ul style="list-style-type: none"> <li>Designate operations-phase marmot protection zone extending a minimum of 200 meters from the outermost flight burrows</li> <li>Prohibit the operation of any motorized vehicles, including cars and all-terrain vehicles, and restrict foot traffic within operations-phase marmot protection zone by Operator personnel</li> <li>Develop and implement marmot protection training to be required of all Operator personnel and visitors to project facilities in the vicinity of the AWPP</li> </ul> <p>The Authority will employ or contract an experienced biodiversity specialist to develop and implement the following Mongolian marmot operations-phase monitoring and long-term protection program</p> <p><b>Operations-Phase Monitoring and Long-term Protection</b></p> <p>Prepare, submit, and implement Mongolian Marmot Monitoring and Evaluation Plan for the Authority's written approval, to monitor and evaluate Mongolian marmot population density and structure, reproduction, and mortality in the vicinity of the AWPP and access road and pedestrian path to the Monument to Terror Victims, and walking trail to the sacred ovoo on Songinokhairkhan Mountain. The plan will specify roles and responsibilities for marmot monitoring and evaluation.</p> <p>The plan may include but not be limited to the following, as determined by the biodiversity specialist and approved by the Engineer:</p> <p><i>Mapping</i></p> <ul style="list-style-type: none"> <li>Burrow clusters</li> <li>Family and individual home ranges</li> <li>Vegetation</li> <li>BWSE-related and other human encroachment</li> </ul> <p><i>Monitoring activities</i></p> <ul style="list-style-type: none"> <li>Use of drone equipped with thermal imaging camera</li> <li>Direct observation aided by binoculars and spotting scopes</li> <li>Use of automatic camera trap</li> <li>Capture with or without marking</li> </ul> <p><i>Monitoring parameters</i></p> <ul style="list-style-type: none"> <li>Burrow cluster population</li> <li>Age of individuals</li> <li>Sex of individuals</li> <li>Home range size</li> <li>Number of families</li> <li>Family composition</li> <li>Number of pups</li> <li>Activity/Behavior</li> <li>Predation</li> <li>Survival and mortality</li> <li>Total population</li> <li>Age and sex distribution of population</li> </ul> <p>Observations are to be repeated during the morning and evening active periods.</p> <p>Monitoring data for the selected parameters will be evaluated as operations phase progresses for changes attributed to loss of marmot habitat or disturbance of marmots. The monitoring and evaluation plan will specify impact indicators and impact criteria determined by the biodiversity specialist and approved by the Authority.</p>

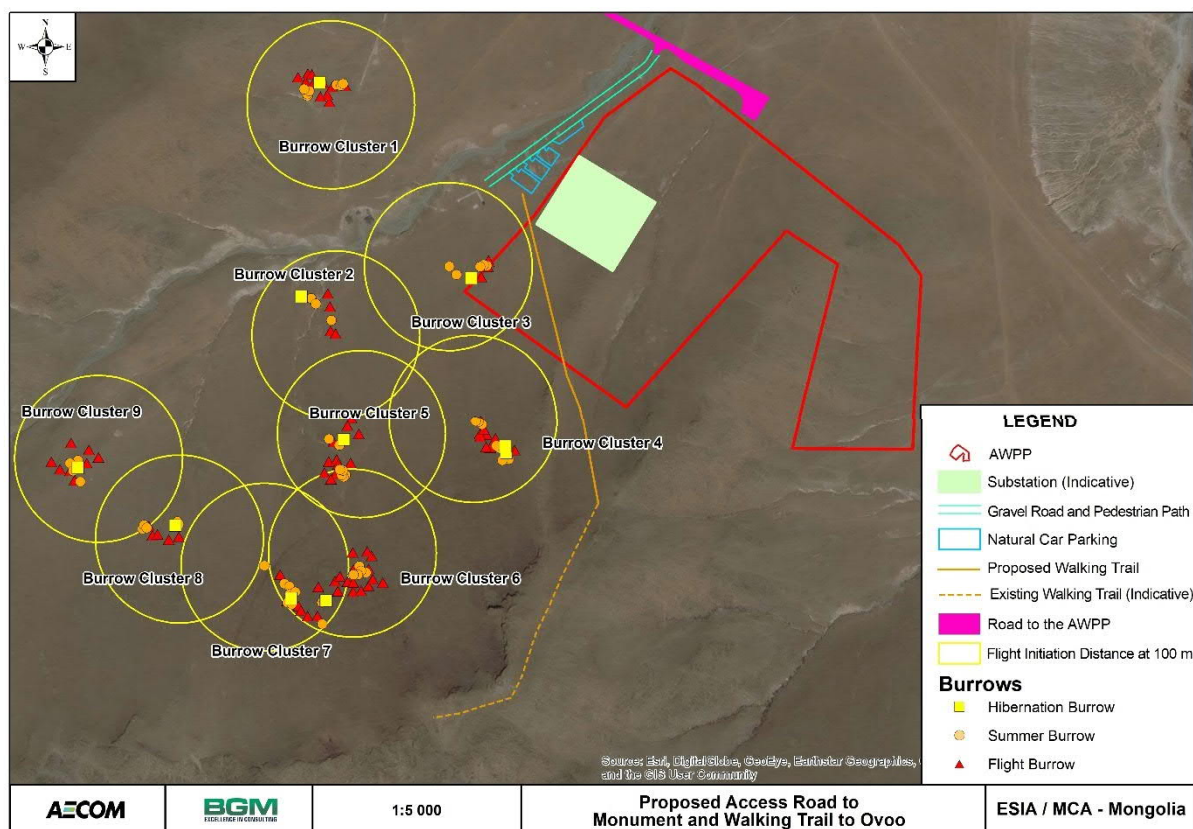


Exceedance of any of the impact criteria will trigger, ***independent of this management measure***, preparing, submitting, and implementing protective actions, in addition to those specified above, formulated to avoid, minimize, or offset the observed adverse impact. Such actions may include the following, as well as other measures recommended by the biodiversity specialist:

- Constructed buffers; e.g., vegetated earth berms
- Rock piles where marmots can watch for predators, thermoregulate, and dig burrows
- Spill protection measures
- Permanent Mongolian marmot protection zone
- Driving restrictions; e.g., prohibit or control off-road driving, set speed limits, restrict non-essential traffic to daytime
- Marmot protection and avoidance training
- Warning and interpretive signage
- Supplemental feeding to increase reproduction and survival, and attract marmots away from roads

The Operator will be requested to provide a quotation to implement such actions identified by the biodiversity specialist should the impact criteria be triggered.

#### LOCATIONS:



Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the following figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults:

#### MONITORING

Document submission and approval of plan

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan

Mountain, as located on the above figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<b>Indicators:</b> <ul style="list-style-type: none"> <li>• Development and implementation of protection measures</li> <li>• Submission of operations-phase monitoring and long-term protection plan</li> <li>• Collection and evaluation of Mongolian marmot population density and structure, reproduction, and mortality data</li> <li>• Specific impact criteria and indicators specified in approved plan</li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Monitoring and protection plan approval</li> <li>• Identification of and timely response to changes attributed to loss of marmot habitat or disturbance of marmots</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report monitoring activities and data evaluation findings</li> <li>• Report impact criteria exceedances and recommended protective actions to be implemented</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Annual, beginning at first year of Operator operations</li> <li>• Late March to late September monitoring season, comprising four monitoring periods: <ul style="list-style-type: none"> <li>○ Late March/early April (post hibernation)</li> <li>○ Late June/early July (pups feeding outside burrows)</li> <li>○ Mid-August (newborn survival and mortality)</li> <li>○ Late September (pre hibernation)</li> </ul> </li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Biodiversity specialist employed by or contracted to Authority <i>Oversight:</i> Authority	<b>MONITORING:</b> <i>Implementation:</i> Biodiversity specialist <i>Reporting:</i> Biodiversity specialist and Contractor <i>Oversight:</i> Authority

## I.3 Waste Management

### Management Measure O&M - 3: Waste Management

<b>POTENTIAL IMPACT</b>
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- Mongolian Law on Hazardous and Toxic Chemicals
  - Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.
- Mongolian Law on Sanitation
  - Prohibits disposing waste in the places other than the specified points.
- Mongolian Law on Waste
  - Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.
- Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste
- Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).
- Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes
  - Requires providing personal protective equipment to the organization's waste management officer.
- Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste
  - Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).
- IFC Performance Standards 3 and 4
  - Encourages recovering and reusing waste in a manner that is safe for human health and the environment.
- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
  - Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.

#### OBJECTIVES

- Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes

#### MANAGEMENT MEASURE

##### Waste Management

The Operator will:

- Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements:
  - Paragraph 1.04.E Hazardous Waste Management Plan
  - Paragraph 1.14 Disposal of Excess Material
  - Paragraph 1.21 Disposal of Debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures:
  - Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner
  - Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material

- Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Authority for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Authority of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Operator's site-specific Waste Management Plan, to all employees and contractors at the time of their induction and annually thereafter

<p>The Operator will prepare and submit for the Authority's written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Operator's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Assigns roles and responsibilities for waste management</li> <li>• Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All BWSE sites and facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>MONITORING</b></p>
<p>Document:</p> <ul style="list-style-type: none"> <li>• Provision, maintenance, and/or updating of: <ul style="list-style-type: none"> <li>- MSDSs</li> <li>- Secondary containment capacity for all storage of liquid hazardous materials</li> <li>- Tanks and sumps inspection records</li> <li>- Spill kits</li> <li>- First aid</li> <li>- Waste inventory</li> <li>- Waste management training</li> </ul> </li> <li>• Submission and approval of site-specific Waste Management Plan</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All BWSE sites and facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Submission of site-specific Waste Management Plan</li> <li>• Volumes of waste generated</li> <li>• Volumes of waste sent for off-site recycling</li> <li>• Number of reported non-compliances with the controls identified in the plan</li> <li>• Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Number of reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Approval of site-specific Waste Management Plan</li> <li>• Minimize volume of waste generated</li> <li>• Maximize volume of waste sent for off-site recycling</li> <li>• Zero: <ul style="list-style-type: none"> <li>- Reported non-compliances with the controls identified in the plan</li> <li>- Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>- Reported waste incidents</li> <li>- Number of waste related community complaints</li> <li>- Instances of off-site contamination identified</li> </ul> </li> </ul>
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Authority of site-specific Waste Management Plan</li> <li>• Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> </ul>

<ul style="list-style-type: none"> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Authority approval prior to starting any construction activities</li> <li>Management measure and plan implementation throughout construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Authority as they occur</li> <li>Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Operator <i>Oversight:</i> Authority	<b>MONITORING:</b>  <i>Implementation:</i> Operator <i>Reporting:</i> Operator <i>Oversight:</i> Authority

## I.4 Social and Gender Inclusion

### Management Measure O&M - 4: Labor Management

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> <li>Women's employment opportunities in operations and maintenance related work in the water supply sector</li> <li>Potential alleviation of poverty in local area</li> <li></li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>  Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>Mongolian Law on Gender Equality</li> </ul>



- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.
- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction
- Mongolian Law on Minimum Wage
  - Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.
- Mongolian Law on the Protection of the Rights of the Child
  - Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children
- Mongolian Law on Social Protection of Disabled Persons
  - Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- Mongolian Law on Combating Human Trafficking
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Operator will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Operator will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Operator will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Operator will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Operator will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
  - Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy
  - Requires contractors to actively manage employment conditions to prevent exploitation of workers by employers.

- Millennium Challenge Corporation Gender Policy and Commitment to Gender Integration and Social Inclusion
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Aol of the project and which encourages contractors to employ as workers at least 30% women
  - Requires employers to make working conditions suitable for both male and female employees.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
  - Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
  - Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
  - International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

#### OBJECTIVES

The Labor Management Plan ensures that the Operator and their workers have clear expectations about the behaviors and conditions expected of the Operator and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities
- Achieve a target of women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor
- Maximize the beneficial impact of the project on the affected communities

#### MANAGEMENT MEASURE

##### Labor Management

The Authority Social Safeguards Team (SST) will:

- Encourage Operator to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Cooperate with the local District Labor Offices
- Encourage the publication of vacancies and procurements within affected communities
- Encourage the holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local business and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and Khoroo Labor Offices and Operator
- Encourage Operator to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Encourage Operator engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships

The Operator will:

- Fully comply with the requirements of this management measure
- Perform the work in accordance with relevant sections of the ESMP

### *Access to Employment*

- The Operator will:
  - Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting
  - Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
  - Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
  - Develop an employment forecast and a written recruitment strategy to encourage the employment of qualified individuals among the local population(s) in project operations and maintenance with particular focus on women, youth, and to achieve a target of women's employment of at least 30% of personnel at each skill/occupational level, and to provide training on how to be effective in operating and maintaining the BWSE facilities and infrastructure. Through the Operator's Social Safeguards Officer, liaise with the Authority SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), and publicize a fair, consistent and transparent recruitment process
  - In disseminating information on potential employment opportunities, take steps to maximize outreach, using all forms of media that may be appropriate
  - Ensure that all staff have written employment contracts with fair employment conditions to workers, give equal pay for equal work to men and women, and fulfil all conditions specified under the Mongolian Law on Labor defining the contracts
- The Operator is encouraged to create pay bands for each category of worker to ensure equal pay for equal work
- 
- As feasible, the Operator will:
  - Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
  - Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

### *Local Procurement*

- The Operator will:
  - Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
    - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
    - Publicizing and hold procurement workshops within the targeted geographical area or targeted group
    - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
  - In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

### *Workplace Environment*

- The Operator will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - o Expectations of worker behavior, and penalties for transgression
  - o Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the Authority may take in response to confirmed cases of engagement of trafficking in persons
  - o Compliance with the Operator's Anti-Sexual Harassment Policy and notification of the Operator's Sexual Harassment Incident Reporting and Referral Plan
  - o Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - o Conditions for work camps, shelter, water and sanitation, food, and security
  - o The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - o The requirement to respect local customs and practices
- Establish and execute a worker's grievance redress procedure that:
  - o Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial sex with a person under 18 years of age)
  - o Guarantees confidentiality to makers of allegations
  - o Designate the Operator's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - o Refers to the Operator's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - o Specifies that the Operator's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism
  - o In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Operator's Social Safeguards Officer contact the Authority SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation

#### *Training*

- The Operator will:
  - Provide training to enhance the skills of employees using on-the-job training, internships, and apprenticeships, secondment to training programs such as Technical and Vocational Education and Training, etc.
  - Mandate for all employees, before each worker starts work on the site, induction packages that include:
    - o Employment rights and conditions including non-discrimination and equal opportunity
    - o Gender-based violence
    - o Operator's Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Operator's Sexual Harassment Incident Reporting and Referral Plan
    - o Rights to have access to local festivals
    - o Cultural sensitivities, and social norms and practices in each area
    - o Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons

- Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Operator and the Authority may apply, and mechanisms for reporting suspected instances of TIP with the Operator's TIP Response Plan
- Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the Authority SST
- Require that the Social Safeguards Officer, together with the Authority SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the Authority Social Manager

*Site-specific Labor Management Plan*

The Operator will prepare and submit for the Authority's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Operator's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Operator's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the MCC Gender Policy coordinated and agreed with the Authority SST and operated by the Operator's Social Safeguards Officer
  - Employment aspects of the MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

**LOCATIONS:**

All BWSE sites and facilities

**MONITORING**

Authority SST:

- Monitor implementation of Operator's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor
- Monitor implementation of Operator's employment recruitment strategies and assist Operator to reach potential local women, youth, and other excluded groups
- Monitor participation by all parties in the Operator's internal grievance redress procedure and external Grievance Redress Mechanisms

Operator:

- Record results of Operator's labor management responsibilities, with all data and statistics disaggregated by age and gender, and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)
- Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities
- Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Operator's internal grievance process

<b>LOCATIONS:</b>	
All BWSE sites and facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<p><b>Indicators:</b></p> <ul style="list-style-type: none"> <li>• Required plans written, approved, and implemented</li> <li>• Number, content, and outcome of employment against home location (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>• Use of written contracts with defined pay scales by employment activity</li> <li>• Employment recruitment activities, and interactions with local employment offices and communities, professional associations, and TVET centers</li> <li>• Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>• Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>• Number of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul> <p><b>Success Criteria:</b></p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ 100% of Operator and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor at BWSE sites and facilities</li> <li>○ Any cases of child or forced labor are reported and dealt with in a timely manner, with respect for the child(ren) and families affected</li> <li>○ Maximization of local labor such that percentage of all labor exceeds a minimum target percentage to be determined between the Operator and the Authority SST</li> <li>○ Achievement of 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Operator and the Authority SST</li> <li>○ Apprenticeships and internships established and completed for each year of operations</li> <li>○ All worker and community complaints about sexual harassment are: a) addressed in a timely manner; and b) resolved through the Operator’s Sexual Harassment Incident Referral and Reporting Plan</li> <li>○ Resolution of 100% of internal grievances within a duration to be determined between the Operator and the Authority SST</li> </ul> </li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Authority of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i>	<i>Implementation:</i>



<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Authority approval prior to starting any operation and maintenance activities</li> <li>Training prior to starting any operation and maintenance activities and annually thereafter</li> <li>Implementation of above provisions throughout operations</li> </ul>	<ul style="list-style-type: none"> <li>Document communications and written approval of Authority as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> Authority and Operator	<i>Implementation:</i> Authority and Operator
<i>Oversight:</i> Authority	<i>Reporting:</i> Authority and Operator
	<i>Oversight:</i> Authority

### Management Measure O&M - 5: Gender Integration and Social Inclusion (GSI)

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages employers to prioritize using local labor, particularly those from the project affected areas and encourages employers to employ women workers as at least 30%</li> </ul> </li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2 <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality</li> </ul>

<ul style="list-style-type: none"> <li>○ Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>○ Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>○ Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract at each skill/occupational level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impact of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Operator will perform the work in accordance with relevant sections of the ESMP. The Operator will ensure the widest exchange of information between Operator and the local population and Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Operator will prepare and submit for the Authority's written approval an Operator's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risk and Impacts</li> <li>○ Agreed with the Authority Social Safeguards Team and operated by the Operator's Social Safeguards Officer</li> </ul> </li> <li>• The Operator will actively consider working with the existing construction brigades for maintenance work to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in: <ul style="list-style-type: none"> <li>○ Modern tools and techniques where needed</li> <li>○ Brigade internal labor management, accounting, and estimation techniques</li> </ul> </li> <li>• As referenced in the Labor Management Plan and its recruitment strategy, the Operator will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on information boards in District and khoroo Labor Offices and with information on employment disseminated by the Operator's Social Safeguards Officer, the Authority's SST or other means approved by the Authority.</li> <li>• Where appropriate, the Operator will provide training to enhance the skills of local people using apprenticeships and internships.</li> <li>• As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduate and members <ul style="list-style-type: none"> <li>○</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• The Operator will develop and submit a procurement forecast of all goods and services that could be procured locally. The Authority Social Safeguards Team will assist in disseminating this information to local communities with the Operator's Social Safeguards Officer.</li> <li>• The Operator will develop and submit for review and approval by the Authority, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Operator and to project workers, particularly targeting small businesses and those owned by women.</li> <li>• The Operator Social Safeguards Officer and Authority Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> <li>•</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All BWSE sites and facilities</p>
<p><b>MONITORING</b></p>
<p>Authority SST:</p> <ul style="list-style-type: none"> <li>• Monitor Operator Gender Integration and Social Inclusion Plan</li> <li>• Monitor contractor employment recruitment strategies and assist contractors to reach potential women, youth and other excluded groups</li> <li>• Monitor participation by all parties in the contractors internal and external project Grievance Redress Mechanisms</li> <li>• Document contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Operator:</p> <ul style="list-style-type: none"> <li>• Record results of Operator's Gender Integration and Social Inclusion responsibilities</li> <li>• Document all grievance redress activities under the Operator's internal and external grievance redress process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All BWSE sites and facilities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Employment recruitment activities</li> <li>• Employment records of workers</li> <li>• Number, dates, and locations of community engagement meetings</li> <li>• Community related grievance redress actions and outcomes</li> <li>• Number of purchase orders signed each year with businesses in UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Total annual dollar amount of procurements from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Number, percentage and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Operator and Authority SST</li> <li>• Achievement of 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>• Employment of young people and "vulnerable" groups at a target to be determined between the Operator and Authority SST</li> <li>• Apprenticeships and internships established and completed for each year of operations</li> </ul>

<ul style="list-style-type: none"> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Operator and Authority</li> <li>Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Operator and Authority SST <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> </ul> </li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Reports on SGI to be included in BWSE monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Throughout operations and maintenance phase</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update recording of SGI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Operator <i>Oversight:</i> Authority Social Safeguards Team	<b>MONITORING:</b>  <i>Implementation:</i> Operator <i>Reporting:</i> Authority Social Safeguards Team and Operator <i>Oversight:</i> Authority

### Management Measure O&M - 6: Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> <li></li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>  Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring,</li> </ul> </li> </ul>

<p>transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”</p> <ul style="list-style-type: none"> <li>○ Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”</li> <li>• Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed. Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> <li>•</li> </ul>
<p><b>OBJECTIVES</b></p>
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p>
<p><b>Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment</b></p>
<p><i>Counter Trafficking in Persons (C-TIP)</i></p> <ul style="list-style-type: none"> <li>• Under the Counter-Trafficking in Persons Plan, the Operator will perform the work in accordance with relevant sections of the ESMP. The Operator will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements which is instant dismissal.</li> <li>• The Operator will prepare and submit for the Authority’s written approval an Operator’s Counter-Trafficking of Persons Response Plan that shall: <ul style="list-style-type: none"> <li>○ Address the specific TIP risks identified in the ESIA, including withholding of foreign workers’ passports and commercial sex with minors,</li> <li>○ Designate a single responsible person who will notify the Authority within 24 hours of an alleged incident and implement any investigation.</li> <li>○ Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Operator will deal with them in the case of a TIP incident.</li> </ul> </li> <li>• Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish</li> <li>• The Operator shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Authority, and this must be separate from the project grievance mechanism The Counter-Trafficking in Persons Response Plan will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Compliant with Mongolian Laws on Promotion of Gender Equality, to Combat Human Trafficking and to Combat Domestic Violence</li> </ul> </li> </ul>

- Compliant with the MCC Gender Policy and the Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the Authority Social Safeguards Team and operated by the Operator's Social Safeguards Officer
- The Counter-Trafficking in Persons Plan will specifically prohibit:
- - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The mandated penalty for proven incidence is instant dismissal
- The Operator is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Operator shall design and deliver twice yearly training modules to all staff on sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan

#### *Gender-Based Violence*

- The Operator shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Operator shall notify the Authority within 24 hours of any alleged incident of gender-based violence
- The Operator shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Operator is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Operator's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.

#### *Sexual Harassment*

- The Operator shall develop and submit to the Authority an Anti-Sexual Harassment Policy prohibiting sexual harassment, which includes an Incident Reporting and Referral Plan.
- The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Authority, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Operators or other workers to dismiss the complaint.
- The Operator must notify the Authority SST within 24 hours of any allegation of sexual harassment.
- The Operator must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The Authority may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Operator shall fully cooperate with any investigation conducted by the Authority regarding breach of this provision. The Operator will ensure that any incident of sexual harassment investigated by the Authority has been resolved to the Authority's satisfaction.



<ul style="list-style-type: none"> <li>The Operator shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Operator's Anti-Sexual Harassment Policy. <ul style="list-style-type: none"> <li>Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.</li> <li>Training shall address <ul style="list-style-type: none"> <li>Attitudes to and prevention of sexual harassment in the workplace</li> <li>Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons</li> <li>Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> </ul> </li> </ul> </li> <li>Information about the Operator's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> <li></li> </ul>
LOCATIONS:
All BWSE sites and facilities
<b>MONITORING</b>
<p>Authority SST:</p> <ul style="list-style-type: none"> <li>Monitor Operator Counter-Trafficking in Persons Response Plan</li> <li>Monitor Contractor performance related to gender-based violence requirements</li> <li>Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>Monitor Operator employment grievance mechanism</li> <li>Participate in the Operator's internal Grievance Redress Mechanisms on allegations of sexual harassment and violence</li> <li></li> </ul> <p>Operator:</p> <ul style="list-style-type: none"> <li>Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Operator responses</li> <li>Document all implementation of the results of Operator's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>Document all grievance redress activities under the Operator's internal grievance process</li> </ul>
LOCATIONS:
All BWSE sites and facilities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Content of the Operator's C-TIP Response Plan</li> </ul>

- Content of the Operator's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Number and content of trainings for all staff
- Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location
- Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons
- Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints
- Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training

**Success Criteria:**

*Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of operations and functioning effectively thereafter
- The Operator's TIP Response Plan is thorough, references any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

*Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

*Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

•	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MANAGEMENT MEASURE:
<i>Implementation:</i>	<i>Implementation:</i>
<ul style="list-style-type: none"> <li>• Throughout operations and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout operations and maintenance</li> </ul>
<b>RESPONSIBILITY</b>	
MANAGEMENT MEASURE:	MANAGEMENT MEASURE:
<i>Implementation:</i> Operator	<i>Implementation:</i> Operator
<i>Oversight:</i> Authority Social Safeguards Team	<i>Oversight:</i> Authority Social Safeguards Team

## I.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure O&M - 1: Emergency Preparedness and Response
- Management Measure O&M - 2: Waste Management

### Management Measure O&M - 7: Health and Safety Management

<b>POTENTIAL IMPACT</b>
Health and safety risks and impacts on work sites and in construction camps, and in the community
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:
<ul style="list-style-type: none"> <li>• Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>- Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>- Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>• IFC Performance Standard 4 <ul style="list-style-type: none"> <li>- Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>- Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning</li> <li>- Provides guidance on occupational health and safety and community health and safety.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Water and Sanitation</li> <li>- Provides guidance on occupational health and safety and community health and safety relevant to the operation and maintenance of potable water withdrawal, treatment, and distribution systems.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Identify, assess, manage, and record and communicate all health and safety hazards, and ensure: <ul style="list-style-type: none"> <li>- Resulting risks to people, property, assets, and the environment are evaluated</li> <li>- Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical</li> <li>- Any requirements to mitigate risks are implemented</li> <li>- Risks and actions to manage them are reported and communicated</li> </ul> </li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Health and Safety Management</b></p> <p>The Operator will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.</p> <p>The Operator will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup></li> <li>• Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to: <ul style="list-style-type: none"> <li>○ Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan</li> <li>○ Section 01046 Control of Work, Paragraph 3.05 Open Excavations</li> <li>○ Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets</li> <li>○ Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control</li> <li>○ Protect drinking water sources, whether public or private, at all times</li> </ul> </li> <li>• Prepare and implement a traffic control plan for accessing BWSE sites and facilities</li> <li>• Implement all reasonable precautions to protect the health and safety of workers</li> <li>• Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers</li> <li>• Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities</li> <li>• Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident</li> <li>• Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities</li> <li>• Avoid or minimize traffic accidents and promote traffic safety by all project personnel</li> <li>• Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials</li> <li>• Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures</li> <li>• Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Operator and subcontractor personnel, and site visitors will take notice</li> </ul>

<ul style="list-style-type: none"> <li>• Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and contractors at the time of their induction and annually thereafter</li> </ul> <p>The Operator will prepare and submit for the Authority's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Operator's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project</li> <li>• Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply</li> <li>• Specifies: <ul style="list-style-type: none"> <li>- Site security, including securing of excavations, hazardous materials, etc.</li> <li>- Confined space safety procedures</li> <li>- Excavation and trenching safety measures</li> <li>- First aid facilities, equipment, and materials</li> <li>- Protective clothing and safety equipment</li> <li>- HIV/AIDS awareness program</li> <li>- Covid-19 awareness program</li> <li>- Counter-trafficking in persons program</li> <li>- Health and Safety management monitoring and reporting</li> </ul> </li> <li>• Assigns roles and responsibilities for health and safety management</li> </ul>	
<p><b>LOCATIONS:</b></p> <p>All BWSE sites and facilities, and surrounding communities</p>	
<p><b>MONITORING</b></p> <p>Document submission and approval of plan</p>	
<p><b>LOCATIONS:</b></p> <p>All project sites and surrounding communities</p>	
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Submission of plan</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Authority of site-specific Health and Safety Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Authority approval prior to starting any operations and maintenance activities</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Authority as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p>	<p><b>MONITORING:</b></p>

<i>Implementation:</i> Operator	<i>Implementation:</i> Operator
<i>Oversight:</i> Authority	<i>Reporting:</i> Operator
	<i>Oversight:</i> Authority

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## I.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, community outreach and grievance redress. The overall goals of these requirements are to provide operator employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure O&M - 1: Emergency Preparedness and Response
- Management Measure O&M - 2: Waste Management
- Management Measure O&M - 3: Labor Management
- Management Measure O&M - 4: Gender Integration and Social Inclusion
- Management Measure O&M - 5: Counter-Trafficking in Persons for Sex
- Management Measure O&M - 6: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure O&M - 8: Stakeholder Engagement, Community Consultation, and Grievance Redress

POTENTIAL IMPACT
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> </ul>



- Foster positive relations and effective partnerships with local communities throughout project construction and operation
- Maximize the beneficial impact of the BWSE project on the affected communities

#### MANAGEMENT MEASURE

#### Stakeholder Engagement, Community Consultation, and Grievance Redress

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

- The Authority will establish a Social Safeguards Team (SST) staffed by the Authority and the Operator, as follows:
  - To staff the core SST, the Authority will employ a Social Manager who will lead the team, two Social Safeguards Officers, and two Community Liaison Officers.
  - The Operator will employ an additional Social Safeguards Officer as the Operator's representative on the SST.

#### Stakeholder Engagement

- On behalf of the Authority, the SST will:
  - Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the Authority Stakeholder Engagement Framework
  - Maintain, revise, and update the project Stakeholder Engagement Matrix
  - Document all stakeholder engagement activities in the Stakeholder Engagement Matrix
- The Operator will prepare and submit for the Authority's written approval an Operator's Stakeholder Engagement Plan, which will be:
  - Consistent with the Authority Stakeholder Engagement Plan coordinated and agreed with the Authority stakeholder engagement specialists
  - Operated by Operator's Social Safeguards Officer
- At a minimum, the Operator's Stakeholder Engagement Plan will document and specify:
  - Operator's responsibilities and participation in community consultation, specifying:
    - o A standard operating procedure agreed with the Authority that governs how the Operator will interact with local communities
    - o How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
    - o How information is to be shared with the communities and other project partners
    - o Protocols for conducting, recording, and disseminating the results of community consultation
  - Operator's responsibilities and participation in the project Grievance Redress Mechanism, specifying how the Operator will:
    - o Take action to resolve low level grievances
    - o Ensure all employees are trained to understand their role in the project Grievance Redress Mechanism
    - o Participate in higher tier grievance resolution
    - o Participation in the overall monitoring and evaluation of the project

#### Community Consultation

- The SST will
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Authority Grievance Redress Mechanism, and other issues that arise during consultation
  - Introduce Operators' officers to communities
  - Monitor and supervise Operator contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
  - Document all community consultation activities in the Stakeholder Engagement Matrix

- In coordination with the Authority, the Operator will actively promote awareness and disclose information in affected communities on the following:
  - Purpose, nature, and scale of the project
  - Duration of proposed project activities
  - Opportunities for employment
  - Any risks to and potential impacts on such communities and relevant mitigation measures
  - Envisaged stakeholder engagement process
  - Grievance mechanism

#### **Grievance Redress**

- The SST will:
  - Manage, supervise, and monitor participation by all parties in, and use and operation of the Authority Grievance Redress Mechanism
  - Document all grievance redress actions in the Stakeholder Engagement Matrix
  - Report on the Grievance Redress Mechanism to Authority
- The Operator will:
  - Designate the Operator's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism
  - Prepare and submit for the Authority's written approval the Operator's internal grievance process for employees to raise issues about conditions of contact and social behavior

#### **LOCATIONS:**

All construction sites and temporary construction facilities

#### **MONITORING**

##### **Authority**

- Monitor Operator contacts with stakeholders and communities
- Document all stakeholder engagement activities
- Document all community consultation activities
- Monitor participation by all parties in Grievance Redress Mechanism
- Document all grievance redress actions under the Grievance Redress Mechanism

##### **Operator**

- Record results of Operator's community consultation activities
- Document all grievance redress activities under the Operator's internal grievance process

#### **LOCATIONS:**

All BWSE sites and facilities

#### **INDICATORS AND SUCCESS CRITERIA:**

##### **Indicators:**

- Number, content, and outcome of:
  - Stakeholder engagement activities
  - Community consultation activities
  - Grievance redress actions

##### **Success Criteria:**

- Successful outcome of:
  - Stakeholder engagement activities
  - Community consultation activities
  - Resolution of grievances

#### **REPORTING:**

- Update project Stakeholder Engagement Matrix
- Summarize other activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern

<ul style="list-style-type: none"> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Throughout operations and maintenance</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Authority and Operator <i>Oversight:</i> Authority	<b>MONITORING:</b>  <i>Implementation:</i> Authority and Operator <i>Reporting:</i> Authority and Operator <i>Oversight:</i> Authority

## I.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## I.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, the Authority, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its

determination in its regular updates and progress reports. If progress decidedly fails to meet iterative requirements, the Authority will inform the Operator of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. The Authority or the Operator at the direction of the Authority will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

The Operator will implement and monitor the revised management measure, and the Authority will provide oversight.

## **I.9 Decommissioning Process and Risks**

Conceptually, decommissioning the BWSE would entail removing the project infrastructure and restoring the land at the end of the bulk water system's useful life. It is likely that the technological options and preferred methods for decommissioning of the BWSE will be different at the time of decommissioning and cannot be foreseen, and the statutory and regulatory decommissioning requirements will have changed. Decommissioning activities would be undertaken in accordance with the technology and methods, and legislation and regulations prevailing at that the time of decommissioning. However, at this time, the decommissioning requirements are not known and plans for decommissioning have not been detailed.

If undertaken, decommissioning may entail:

- Establishing and decommissioning temporary facilities, including construction camps, laydown, staging, and storage facilities, and fueling stations
- Disconnecting and removing utilities
- Demolishing, removing, and/or abandoning in place infrastructure
- Disinfecting, filling, and sealing wells and pipelines
- Decommissioning well pump houses and the AWPP
- Dismantling and removing equipment and materials
- Reusing, salvaging, recycling, and/or disposing of equipment, materials, and stockpiled, stored, and residual supplies and waste

Depending on the final land uses agreed with the authorities—which in turn would depend on structural and functional shifts in land use and changes in the economy and development priorities over time—all or parts of the project sites may require restoration to a specified representative condition, such as each site's pre-disturbance condition or a condition that would enable a designated future use. This may require that the sites be backfilled with clean and/or granular material, and re-contoured so that pre-disturbance vegetation communities can be reestablished or new land uses are accommodated.

Potential risks arising from decommissioning of the project have not been assessed in detail and have been considered only generally as the useful life of the UB bulk water system and the bulk water system is anticipated to extend decades into the future. Generally, the potential risks that would arise from decommissioning of the BWSE would be similar to those environmental, and social and gender risks identified for the construction phase, as well as loss of some socioeconomic benefits of the operation and maintenance phase:

### **Environmental Risks**

- Soil disturbance, compaction, erosion, and sedimentation
- Dust generation
- Equipment and vehicle exhaust emissions
- Equipment and vehicle noise generation
- Traffic and disruptions to vehicle and pedestrian movement
- Petroleum product, chemical, hazardous and non-hazardous material, and waste spills, leaks, and disposal
- Stream and river sediment disturbance and downstream turbidity, sedimentation, and contamination
- Water quality deterioration from sediment disturbance, and leaks and spills
- Disturbance or loss of vegetation
- Disturbance or loss of fauna, notably Mongolian marmots, and habitat degradation
- Climate change

### **Social and Gender Risks**

- Loss of employment and income
- Loss of entrepreneurial opportunities
- Risks to livelihoods
- Illegal child labor
- Temporary loss of continuity of spiritual, religious, and traditional activities
- Disturbance of the cultural and sacred landscape and places
- Social conflict
- Health, safety, and security risks to decommissioning workers and the community
- Discrimination and harassment
- Gender-based violence and sexual harassment
- Trafficking in persons and prostitution

In general terms, managing these risks would require measures to reinforce beneficial impacts and avoid and mitigate adverse impacts comparable to those specified for the BWSE construction, and operation and maintenance phases. However, due to the above cited uncertainties regarding the timing of potential future decommissioning actions, applicable technological options and statutory and regulatory requirements, and future land uses and development priorities, such management measures cannot be detailed at this time.

## **I.10 Implementation Budget**

Implementation, including monitoring, of the ESMP management measures do not entail a marginal cost. Costs are reflected in the Authority's operating costs and the Operator's budget for operation and maintenance.

The cost of obtaining all required permits are deemed to be included the Operator's budget for operation and maintenance.

The costs of implementing ESMP management measures are primarily driven by staff costs. Other costs are associated with development of policies and plans, training, and equipment.

## Authority Costs

Staff Costs				
Role	Cost	Unit	Total	Assumption
Environmental and Social Manager	-	salary	-	Covered by existing USUG staff
Waste Management Manager	-	salary	-	Covered by existing USUG staff
HSE Manager	-	salary	-	Covered by existing USUG staff
Social Manager	-	salary	-	Covered by existing USUG staff
Social Safeguards Officers	-	salary	-	Covered by existing USUG staff
Community Liaison Officers	-	salary	-	Covered by existing USUG staff
Staff Costs Total			-	

Marmot Monitoring Costs (annual)				
Description	Cost	Unit	Total	Assumption
Binoculars	\$350.00	each	\$700.00	2 pairs
GPS	\$350.00	each	\$350.00	1 piece
Camera	\$1,000.00	each	\$1,000.00	1 piece
Experts in field	\$50.00	per day	\$1,600.00	Two experts, four 4-day missions per year
Reporting on each mission	\$50.00	per day	\$1,600.00	Two experts, four 4-day missions per year for 5 years
Marmot Monitoring Costs Total			\$5,250.00	

## Operator Costs

ESMP Management Measures Cost Estimate:

Staff Costs (annual)				
Role	Cost	Unit	Total	Assumption
Social Safeguards Officers	\$ 1,000.00	salary	\$ 12,000.00	2.5 million MNT/month + benefits
Cost of HR Office				
HR Office costs covered by existing USUG organization				
Cost of HSE Office				



HSE Office costs covered by existing USUG organization				
PPE for visitors and spares	\$ 100.00	per set	\$ 2,000.00	20 sets for visitors + spares.
<b>Cost of SSO Office</b>				
Description	Unit Cost	Unit	Total Cost	Assumption
Personal computer	\$ 2,000.00	each	\$ 2,000.00	1 per SSO staff
Mobile phone	\$ 300.00	each	\$ 200.00	1 per HR staff
Monthly phone plan	\$ 10.00	each	\$ 120.00	1 per HR staff per month
Vehicles		each		Existing USUG vehicle or SSO personal vehicle
Printer	\$ 1,000.00	each	\$ 1,000.00	1 printer
Stationary	\$ 50.00	per month	\$ 600.00	stationary and petty expenses per month
Regular Community Liaison	\$ 60.00	per day	\$ 3,600.00	Stakeholder and community liaison 5 days per month
HR Office Costs Subtotal			\$ 7,520.00	
<b>Plan and Policy Development Costs</b>				
<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>
Labor Management Plan	\$ 2,500.00	each	\$ 2,500.00	HR Expert, 5 days @ \$500/day
Gender Integration and Social Inclusion Plan	\$ 2,500.00	each	\$ 2,500.00	GSI Expert, 5 days @ \$500/day
CTIP Plan	\$ 1,000.00	each	\$ 1,000.00	Expert, 2 days @ \$500/day
Code of Conduct	\$ 2,500.00	each	\$ 2,500.00	Psychologist/HR expert, 5 days @ \$500/day
Stakeholder Engagement Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Grievance Redress Mechanism (GRM)	\$ 2,000.00	each	\$ 2,000.00	Expert, 4 days @ \$500/day
Health and Safety Management Plan	\$ 2,500.00	each	\$ 2,500.00	HSE Expert, 5 days @ \$500/day
Covid-19 Prevention Plan		each		Use USUG plan
Emergency Preparedness and Response Plan	\$ 1,000.00	each	\$ 1,000.00	HSE Expert, 2 days @ \$500/day
Waste Management Plan (WMP)	\$ 1,000.00	each	\$ 1,000.00	Expert for 2 days @ \$500/day
Training Plan	\$ 2,500.00	each	\$ 2,500.00	Expert, 5 days @ \$500/day
Plan and Policy Development Costs Subtotal			\$ 20,000.00	
<b>Training Costs (annual)</b>				
<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>

HR Policy Training		coach/day		General USUG costs
Code of Conduct Training	\$ 500.00	coach/day	\$ 1,000.00	1 training per year for all BWSE staff, full day, groups of ten (\$500/day for coach)
HSE Staff Training		coach/day		General USUG costs
HSE Training		coach/day		General USUG costs
HSE Orientation for visitors		as necessary		Included of HSE staff duties
First Aid training		coach/day		General USUG costs
Emergency Preparedness and Response Training - HSE Staff		coach/day		General USUG costs
Emergency Preparedness and Response Training - all staff	\$ -	per employee	\$ -	Included in HSE training
ESMP Implementation Training Plan	\$ -	per employee	\$ -	Included in HSE training
WMP Training	\$ -	per employee	\$ -	Included in HSE training
Tangible Cultural Heritage Protection Training	\$ -	per employee	\$ -	Included in HSE training
Biodiversity Training	\$ -	per employee	\$ -	Included in HSE training
CTIP Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
CTIP Orientation for subcontractors and service providers	\$ -	per employee	\$ -	Included in HSE Orientation
Anti-Sexual Harassment and Discrimination Training	\$ -	per employee	\$ -	Included in Code of Conduct Training
On-job training, apprenticeships, internships	\$ -	as required	\$ -	Included in staff costs (as per Labor Management Plan)
Community training in HSE, CTIP	\$ -	as required	\$ -	Included in Community Liaison (SSO)
Training Costs subtotal			\$ 1,000.00	
<b>Equipment and Other Costs</b>				
<b>Description</b>	<b>Cost</b>	<b>Unit</b>	<b>Total</b>	<b>Assumption</b>

PPE equipment (hard hat, boots, hi-vis clothing, glasses, gloves)	\$ 100.00	per employee	\$ 2,000.00	PPE provided to all employees each year
First aid kits	\$ 100.00	each	\$ 200.00	1 kit per 10 employees
Emergency Response Plan Dissemination	\$ 2,500.00	overall	\$ 2,500.00	Posters, brochures, etc. at site/ camp indicating emergency procedures and phone numbers
Spill protection equipment	\$ 2,500.00	overall	\$ 2,500.00	Spill sheets for all vehicles, regularly changed.
GRM implementation	\$ -	per year	\$ -	Implementation of the GRM by HR staff/Social Safeguards Officer
Contract with Landfill for inert waste	\$ -	per year	\$ -	Covered in cost of construction operations
Contract with Hazardous waste company	\$ -	per year	\$ -	Covered in cost of construction operations
Equipment and Other Costs Subtotal			\$ 7,200.00	
<b>ESMP Management Measures Costs Total</b>			<b>\$ 49,720.00</b>	

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## Appendix J Environmental and Social Clauses for Bids and Specifications

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### J.1 CP-1: Production Well Drilling, Construction, Development, and Acceptance Testing

#### 1. Introduction

This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-1: Production Well Drilling, Construction, Development, and Acceptance Testing of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>87</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance, which will be conducted by others and is not included in the version of this ESMP which is being issued for construction bidding

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented

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<sup>87</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as Technical Specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.

Technical Specifications, Division 1 – General Requirements
<p><b>Section 01030, Special Requirements</b></p> <ul style="list-style-type: none"> <li>0. Health and Safety Plan</li> <li>1. Product Handling</li> <li>2. Disposal of excess material</li> <li>3. Disposal of debris</li> <li>4. Preconstruction Video Recording of Entire Site</li> <li>5. Detours and Road Accessibility</li> <li>6. Permits, Fees and Bonds</li> </ul> <p><b>Section 01046, Control of Work</b></p> <ul style="list-style-type: none"> <li>7. Hours of Construction</li> <li>8. Open Excavations</li> <li>9. Occupying Private Land</li> <li>10. Interference with and Protection of Streets</li> <li>11. Care and Protection of Property</li> <li>12. Cleanup and Disposal of Excess Material</li> </ul> <p><b>Section 01063, Miscellaneous Requirements</b></p> <ul style="list-style-type: none"> <li>13. Traffic Control</li> <li>14. Interference with Existing Utilities</li> <li>15. Maintaining Flows</li> </ul> <p><b>Section 01110, Environmental Protection Procedures</b></p> <ul style="list-style-type: none"> <li>16. Prevention of Environmental Pollution</li> <li>17. Erosion Control</li> <li>18. Protection of Streams, Wetlands and Surface Water</li> <li>19. Protection of Land Resources</li> <li>20. Protection of Air Quality</li> <li>21. Noise Control</li> </ul> <p><b>Section 01500, Temporary Facilities</b></p> <ul style="list-style-type: none"> <li>22. Temporary Field Offices</li> <li>23. Internet Service</li> <li>24. Temporary Fence</li> <li>25. Potable Water</li> <li>26. Electricity</li> <li>27. Sanitary Conveniences</li> <li>28. Barricades and Guard Lights</li> <li>29. Temporary Heat</li> <li>30. Shelter and Protection of Materials</li> <li>31. Security</li> </ul> <p><b>Section 01568, Erosion Control, Sedimentation &amp; Containment of Construction Materials</b></p> <ul style="list-style-type: none"> <li>32. Erosion Control</li> </ul> <p><b>Section 01610, Delivery, Storage and Handling</b></p> <ul style="list-style-type: none"> <li>33. Storage and Handling of Hazardous Materials</li> </ul> <p><b>Section 01700, Contract Closeout</b></p> <ul style="list-style-type: none"> <li>o Final Cleaning</li> </ul>
Technical Specifications, Division 2 – Site Work



**Section 02210, Earth Excavation, Backfill, Fill and Grading**

- 34. Excavation
- 35. Separation of Excavated Material for Reuse
- 36. Trench Excavation
- 37. Reuse and Disposal of Surplus Excavated Materials
- 38. Care and Restoration of Property
- 39. Backfilling

**Section 02230, Site Clearing**

- 40. Clearing and Grubbing

**Section 02672, Water Supply Well Construction, Development and Pumping Tests**

- 41. Generalized Water Supply Description
- 42. Well Installation Plan
- 43. Protection of Work and Property
- 44. Clean-Up
- 45. Protection of Existing Conditions
- 46. Drilling Preparation
- 47. Performance Pump Testing
- 48. Final Disinfection
- 49. Site Clean-Up

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and schedule for implementing the ESMP.

## **2. Pre-Construction Phase**

### **2.1 Responsibilities During Pre-Construction**

### 2.1.1 MCA-Mongolia

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) and coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

### 2.1.2 Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring of pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by an acceptable CESMP and must be permitted in accordance with all applicable permitting requirements. The Contractor will need to negotiate with and potentially compensate landowners for temporary use of land. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of the ESMP.

The Contractor will designate an Environmental and Social Performance Manager as a key staff. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social, and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and relevant monitoring requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions proposed by the Contractor, as needed, to reflect field conditions with the approval of the Engineer.

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works.

Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan and Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **2.1.3 Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including

implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored. The CESMP, at a minimum, shall include the following plans:

- Environmental Management Plan
- Waste Management Plan
- Social and Gender Inclusion Plan
- Health and Safety Management Plan
- Education, Training, and Community Outreach Plan
- Risk Control and Emergency Response Plan
- Monitoring and Verification, and Maintenance Actions Plan

#### **2.1.3.1 Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site
- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring
- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian Law on Labor, Law on Promotion of Gender Equality, and other relevant employment laws. Ensure each employee has a written contract and is made aware of and signs the Worker Code of Conduct, and ensure compliance with the Labor Management Plan
- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response

- Waste Management
- Labor Management
- Gender Integration and Social Inclusion
- Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Stakeholder Engagement, Community Consultation, and Grievance Redress
- Construction Camp and Temporary Facilities Management
- Cultural Heritage Protection
- Health and Safety Management

When preparing the site-specific CESMP, it will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

#### **2.1.3.2 Management Acknowledgements**

##### **1) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Project Director attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

##### **2) Statutory Understanding and Compliance**

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

a) All current environmental laws and regulations, related to, but not limited to, the following:

- Noise
- Vibration
- Air pollution
- Water contamination
- Solid and hazardous waste disposal
- Waste disposal
- Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
- Use of explosives;
- Protection of public traffic
- Historical, cultural, and archaeological monuments/sites
- Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.

b) All current labor laws and laws related to, but not limited to, the following:

- Contract of employment and labor disputes
- Working conditions
- Management, monitoring, and supervision
- Gender-based discrimination in employment
- Child labor
- Trafficking in persons
- Gender-based violence
- Sexual harassment

c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

### 3) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

### 4) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included in implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

- a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans, documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.
- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

## 2.1.3.3 Organization and Staffing

### 1) Organization Chart

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

### 2) Identification of Responsibilities

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

- a) Environmental and Social Manager



The Environmental and Social Performance Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Performance Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

b) Social and Gender Manager

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements

of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative regarding the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with the MCA-Mongolia or its representative over community contacts
- Liaise with the MCA-Mongolia or its representative to implement and assist in resolution of grievances
- Inform the MCA-Mongolia or its representative of employment vacancies and recruit through the Ministry of Labor offices and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project GRM; documenting, reporting, and taking part in finding solutions

3) Appointments

The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager

- Health and Safety Manager

The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, Health and Safety Manager, and Social Safeguards Officer prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager, will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

#### **2.1.3.4 Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities

##### **1) Environmental, Social and Gender, and Health and Safety Reports**

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.

**Table 1 Reports**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> </ul>

Report	Submission Schedule	Content
		<ul style="list-style-type: none"> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence, and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period, grievances registered and resolved</li> <li>• Grievances registered and resolved.</li> </ul>

## 2) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes:

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons for sex, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the contractor's organization require reporting to the MCA-Mongolia or its representative's Social Safeguards Team. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combatting Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction."

## 3) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.
- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of



performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### 2.1.3.5 Environmental, Social and Gender, and Health and Safety Provisions

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## 2.2 Environmental Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.3 Waste Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.4 Social and Gender Inclusion

### Management Measure Wells -1: Labor Management

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>Women's short-term employment in construction and engineering-related work</li> <li>Potential alleviation of poverty in local area</li> <li>Reduction in child labor</li> <li>Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- Constitution of Mongolia
  - Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.
- Mongolian Civil Code
  - Requires providing office space, tools and equipment necessary to ensure employees' health.
- Mongolian Law on Gender Equality
  - Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.
- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction
- Mongolian Law on Minimum Wage
  - Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.
- Mongolian Law on the Protection of the Rights of the Child
  - Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children
- Mongolian Law on Social Protection of Disabled Persons
  - Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- Mongolian Law on Combating Human Trafficking
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary

practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.

- Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
- Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
- Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
- International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Pplan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities and procurement from local suppliers
- Target women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain and improve a constructive worker-management relationship
- Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor or trafficked labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor’s cooperation with the local District Labor Offices
- Facilitate the Contractor’s publication of vacancies and procurements within affected communities

- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with District and khoroo Labor Offices and Contractor
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and, youth, and disadvantaged groups, 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level, and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
- Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
- Publicizing and holding procurement workshops within the targeted geographical area or targeted group
- Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - o Expectations of worker behavior, and penalties for transgression
  - o MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - o Zero-tolerance for gender-based violence
  - o Compliance with the Contractor’s Anti-Sexual Harassment Policy and notification of the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - o Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - o Conditions for work camps, shelter, water and sanitation, food, and security
  - o The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers’ Code of Conduct by signing the code sheet
  - o The requirement to respect local customs and practices
- Establish and execute a workers’ grievance redress procedure that:
  - o Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - o Guarantees confidentiality to makers of allegations
  - o Designates the Contractor’s Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - o Refers to the Contractor’s Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - o Specifies that the Contractor’s zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
  - o In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor’s Social Safeguards Officer contact the MCA-Mongolia or its representative’s SST to include them in the investigation and appoint

a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation

- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor’s responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor’s employment forecast and recruitment strategy, and the Contractor’s Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor’s Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor’s TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative’s SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative’s SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative’s Social Manager

### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer’s written approval a site-specific Labor Management Plan that:



<ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct</li> <li>• Is consistent and compliant with: <ul style="list-style-type: none"> <li>○ Mongolian Law on Labor</li> <li>○ Relevant aspects of the Conditions of Contract, as well as MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>○ The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>• Assigns roles and responsibilities for labor management</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
<p>INDICATORS AND SUCCESS CRITERIA:</p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>▪ Required plans written, approved, and implemented</li> <li>▪ Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>▪ Use of written contracts with defined pay scales by employment activity</li> <li>▪ Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> <li>▪ Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>▪ Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>-</li> <li>▪ Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>▪ Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul>

<ul style="list-style-type: none"> <li>Number of apprenticeship and internships established and completed</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships Internments established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> </ul> </li> <li>100% of employees and sub-contractors sign the worker code of conduct</li> <li>Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## Management Measure Wells -2: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2 <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
OBJECTIVES
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <ul style="list-style-type: none"> <li>To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> </ul>

<ul style="list-style-type: none"> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impacts of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and District and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</li> <li>○ Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> <li>- <i>Community engagement</i></li> <li>• The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>○ Efforts to hire local labor and the Contractor's employment forecast</li> <li>○ Efforts to maximize women's employment</li> <li>○ Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>○ Prohibitions against child labor and forced labor in supply chains</li> <li>○ Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>○ Zero-tolerance of gender-based violence</li> <li>○ Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> <li>- <i>Expanding Short-term Employment Opportunities</i></li> <li>• The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in: <ul style="list-style-type: none"> <li>○ Modern tools and techniques where needed</li> <li>○ Brigade internal labor management, accounting, and estimation techniques</li> </ul> </li> <li>• As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.</li> <li>• Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships. As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with secondment to training programs such as Technical and Vocational Education and Training Centers and</li> </ul>

<p>professional associations and to draw workers from among their graduates and members, etc..</p> <p>-</p> <p><i>Local Procurement</i></p> <ul style="list-style-type: none"> <li>The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.</li> <li>The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</li> <li>The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>Monitor Contractor Gender Integration and Social Inclusion Plan</li> <li>Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Employment recruitment activities</li> <li>Employment records of workers</li> <li>Number, dates, and locations of community engagement meetings</li> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>

<ul style="list-style-type: none"> <li>Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and “vulnerable” groups at a target to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST)</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor’s Sexual Harassment Incident Referral and Reporting Plan</li> <li>Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> Engineer

### Management Measure Wells -3: Counter Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>



Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- MCC Counter-Trafficking in Persons Policy (C-TIP Policy)
  - States, “Trafficking in Persons” means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”
  - Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the foregoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”
  - Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.
- Mongolian Law on Promotion of Gender Equality
  - Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.
- Mongolian Law to Combat Human Trafficking
  - The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims’ rights.

## OBJECTIVES

- To prevent incidence of trafficking of persons for sex by project employees
- To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites
- To prevent sexual harassment at all construction sites and temporary construction facilities
- To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace
- To prevent incidences of gender-based violence involving workers

## MANAGEMENT MEASURE

### Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers’ induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter-Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer’s written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers’ passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.

- Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy

<p>prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.</p> <ul style="list-style-type: none"> <li>○ The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.</li> <li>○ The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.</li> </ul> <ul style="list-style-type: none"> <li>• Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contactor or other workers to dismiss the complaint.</li> <li>• The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.</li> <li>• The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.</li> <li>• The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.</li> <li>• The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment. <ul style="list-style-type: none"> <li>○ Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.</li> <li>○ Training shall address <ul style="list-style-type: none"> <li>▪ Attitudes to and prevention of sexual harassment in the workplace</li> <li>▪ Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons</li> <li>▪ Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> </ul> </li> </ul> </li> <li>• Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> <li>•</li> </ul>	<div style="background-color: #e0f0ff; padding: 5px;"><b>LOCATIONS:</b></div> <p>All construction sites and temporary construction facilities and project affected communities</p> <div style="background-color: #e0f0ff; padding: 5px;"><b>MONITORING</b></div> <p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> <li>•</li> </ul> <p>Contractor:</p>
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<ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:</li> </ul>

<ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> <li>○ The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence</li> <li>○ Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases</li> <li>○ 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it</li> </ul>	
<p><i>Sexual harassment</i></p> <ul style="list-style-type: none"> <li>• The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work</li> <li>• All worker and community complaints about sexual harassment are <ul style="list-style-type: none"> <li>○ addressed confidentially</li> <li>○ addressed in a timely manner and</li> <li>○ resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan</li> </ul> </li> <li>• After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor <i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team</p>

## 2.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure Wells - 1: Labor Management
- Management Measure Wells - 2: Gender Integration and Social Inclusion
- Management Measure Wells - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure Wells - 4: Stakeholder Engagement, Community Consultation, and Grievance Redress

POTENTIAL IMPACT
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
MANAGEMENT MEASURE
<b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b>
The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.
<b>Stakeholder Engagement</b>
<ul style="list-style-type: none"> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirements described in Annex B of the ESMP</li> </ul>



- At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify:
  - Contractor's responsibilities and participation in community consultation, specifying:
  - A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities
  - How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
  - How information is to be shared with the communities and other project partners
  - Protocols for conducting, recording, and disseminating the results of community consultation
- The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of the ESMP

### **Community Consultation**

- The MCA-Mongolia or its representative will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation
  - Actively promote awareness and disclose information in affected communities on the following:
    - Purpose, nature, and scale of the project
    - Duration of proposed project activities
  - Record results of Contractor's community consultation activities
  - Document all community consultation activities in the Stakeholder Engagement Matrix

### **Grievance Redress**

- The MCA-Mongolia or its representative will:
  - Supervise, and monitor participation by all parties
- The Contractor will:
  - Develop and implement the Grievance Redress Mechanism consistent with Annex A
  - Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism
  - Document all grievance redress actions
  - Report on the Grievance Redress Mechanism to the Engineer

#### **LOCATIONS:**

All construction sites and temporary construction facilities and project affected areas

#### **MONITORING**

##### **MCA-Mongolia or its representative**

- Monitor Contractor contacts with stakeholders and communities
- Monitor participation by all parties in Grievance Redress Mechanism

##### **Contractor**

- Document all Contractor's stakeholder engagement and consultation activities
- Document all grievance redress activities under the Grievance Redress Mechanism

<b>LOCATIONS:</b>	
All construction sites and temporary construction facilities and project affected areas	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<b>Indicators:</b> <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> <li>Success Criteria:</li> </ul> </li> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## 2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## 2.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
1. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## 3 Construction Phase

### 3.1 Responsibilities During Construction

#### 3.1.1 MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) to coordinate with the Contractor during the construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### 3.1.2 Contractor

Unless otherwise specified for individual management measures, the construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects

of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards, and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## **3.2 Environmental Management**

### Management Measure Wells -5: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>◦ Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>◦ Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>◦ Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>◦ Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>◦ Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> </ul> </li> <li>• Mongolian Criminal Code <ul style="list-style-type: none"> <li>◦ Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> </ul> </li> <li>• IFC Performance Standards 1, 3, and 4 <ul style="list-style-type: none"> <li>◦ Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>◦ Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
MANAGEMENT MEASURE
<p><b>Emergency Preparedness and Response</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer’s written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul>

## **Hazardous Materials Management**

- Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials
- Develop prioritized material-specific handling procedures and training requirements as necessary according to risk
- Assign an officer to manage and advise on hazardous materials management

### *Handling*

- Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities
- Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)
- Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells

### *Transport*

- Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials
- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

## **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks



presented from the mobile machinery and will be adequate and appropriate for the materials being transported.

- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

### **Emergency Preparedness and Response Plan**

- Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan
  - Specifies:
    - Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment
    - Potential emergencies and key areas prone to emergency situations
    - Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.
    - Actions to be taken prior to an emergency—i.e., preventive and preparatory measures
    - Actions to be taken during an emergency—i.e., response measures
    - Actions to be taken after an emergency—i.e., recovery and assessment measures
    - Contact lists for emergency situations
    - Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas
    - Assigns roles and responsibilities for emergency preparedness and response
- Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities
- In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

Document submission and approval of plan

#### LOCATIONS:

All construction sites and temporary construction facilities

#### INDICATORS AND SUCCESS CRITERIA:

<b>Indicators:</b> <ul style="list-style-type: none"> <li>• Submission of plan</li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.3 Waste Management

#### Management Measure Wells - 6: Waste Management

<b>POTENTIAL IMPACT</b>
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>  Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Hazardous and Toxic Chemicals             <ul style="list-style-type: none"> <li>○ Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>• Mongolian Law on Sanitation             <ul style="list-style-type: none"> <li>○ Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>• Mongolian Law on Waste             <ul style="list-style-type: none"> <li>○ Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> <li>• Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste</li> <li>• Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).</li> <li>• Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes             <ul style="list-style-type: none"> <li>○ Requires providing personal protective equipment to the organization's waste management officer.</li> </ul> </li> </ul>

- Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste
- Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).
- IFC Performance Standards 3 and 4
  - Encourages recovering and reusing waste in a manner that is safe for human health and the environment.
- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
  - Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.

#### OBJECTIVES

- Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes

#### MANAGEMENT MEASURE

##### Waste Management

The Contractor will:

- Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements:
  - Paragraph 1.04.E Hazardous Waste Management Plan
  - Paragraph 1.14 Disposal of Excess Material
  - Paragraph 1.21 Disposal of Debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures:
  - Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner
  - Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 150%-capacity secondary containment for fluids stored in drums and buckets or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits

- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor's site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter
- The Contractor will prepare and submit for the Engineer's written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Assigns roles and responsibilities for waste management
  - Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available

#### LOCATIONS:

All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of

#### MONITORING

Document:

- Provision, maintenance, and/or updating of:
  - MSDSs
  - Secondary containment capacity for all storage of liquid hazardous materials
  - Tanks and sumps inspection records
  - Spill kits
  - First aid
  - Waste inventory
  - Waste management training
- Submission and approval of site-specific Waste Management Plan

<b>LOCATIONS:</b>	
All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Submission of site-specific Waste Management Plan</li> <li>• Volumes of waste generated</li> <li>• Volumes of waste sent for off-site recycling</li> <li>• Number of reported non-compliances with the controls identified in the plan</li> <li>• Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Number of reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Approval of site-specific Waste Management Plan</li> <li>• Minimize volume of waste generated</li> <li>• Maximize volume of waste sent for off-site recycling</li> <li>• Zero: <ul style="list-style-type: none"> <li>• Reported non-compliances with the controls identified in the plan</li> <li>• Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> </li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>• Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Management measure and plan implementation throughout construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>



## 3.4 Social and Gender Inclusion

### Management Measure Wells - 7: Labor Management

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> <li>Women's short-term employment in construction and engineering-related work</li> <li>Potential alleviation of poverty in local area</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> </ul>

- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
  - Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent trafficking in persons and related activities and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
- Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
- Ministry of Labor and Social Welfare Order (2016)

- Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
- International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities
- Achieve a target of women's employment as 30% of all labor at each skill/occupational level
- Establish and maintain, a constructive worker-management relationship
- Protect workers, including "vulnerable" categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative's Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the publication of vacancies and procurements within affected communities
- Facilitate the holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local business and entrepreneurs to bid
- 
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships

The Contractor will:

- Fully comply with the requirements of this management measure
- Perform the work in accordance with relevant sections of the ESMP

### Access to Employment

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth; 2) achieve a target of women's employment at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors

- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), and publicize a fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- create pay bands for each category of worker to ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university
- The Contractor shall note contract clauses on "Gender," "Engagement of Staff and Labor," "Foreign Personnel," "Prohibition of Forced or Compulsory Labor," "Prohibition of Harmful Child Labor," "Employment Records of Workers," and "Non-Discrimination and Equal Opportunity."

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and hold procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons.. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security

- The responsibility of all workers, regardless of their role or duration of employment, to review and acknowledge the Workers' Code of Conduct by signing the code sheet
- The requirement to respect local customs and practices
- Establish and execute a grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- 
- The Contractor shall note the contract clause on "Prohibition of Sexual Harassment"
- The Contractor shall note the contract clause on "Facilities for Staff and Labor" and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, and apprenticeships,.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to "adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds" per the contract clause on "Engagement of Staff and Labor," the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan

<ul style="list-style-type: none"> <li>▪ Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission</li> <li>○ Undertake a series of employment and social plan inductions and employee awareness programs that: <ul style="list-style-type: none"> <li>▪ All employees must attend at the commencement of employment and over the employment period twice yearly</li> <li>▪ Incorporate toolbox talks that include reinforcement of all training programs</li> </ul> </li> <li>○ Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST</li> <li>○ Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues. These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager</li> </ul>
<p><i>Site-specific Labor Management Plan</i></p> <p>The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:</p> <ul style="list-style-type: none"> <li>• Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>• Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct</li> <li>• Is consistent and compliant with: <ul style="list-style-type: none"> <li>- Mongolian Law on Labor</li> <li>- Relevant aspects of the MCC Gender Policy coordinated and agreed with the MCA-Mongolia or its representative's SST and operated by the Contractor's Social Safeguards Officer</li> <li>- The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>• Assigns roles and responsibilities for labor management</li> </ul>
<p>LOCATIONS:</p>
<p>All construction sites and temporary construction facilities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>• Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups</li> <li>• Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's labor management responsibilities, with all data and statistics disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>• Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>• Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul> <p>LOCATIONS:</p>



All construction sites and temporary construction facilities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>Required plans written, approved, and implemented</li> <li>Number, content, and outcome of employment against home location (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>Use of written contracts with defined pay scales by employment activity</li> <li>Employment recruitment activities, and interactions with local employment offices and communities, professional associations, TVET centers</li> <li>Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>Number of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguard Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are: a) addressed in a timely manner; and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>100% of employees and sub-contractors sign the worker Code of Conduct</li> </ul> </li> <li>Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
SCHEDULE	
MANAGEMENT MEASURE:	MONITORING:
Implementation:	Implementation: <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul>

<ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<ul style="list-style-type: none"> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### Management Measure Wells - 8: Gender Integration and Social Inclusion (GSI)

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment for women Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected areas and encourages contractors to employ women workers as at least 30%</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2 <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia</li> </ul>

<ul style="list-style-type: none"> <li>○ Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>○ Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>○ Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>○ Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impacts of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risk and Impacts</li> <li>○ Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> <li>-</li> <li>- <i>Community Engagement</i> <ul style="list-style-type: none"> <li>○ The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>○ Efforts to hire local labor and the Contractor's employment forecast</li> <li>○ Efforts to maximize women's employment</li> <li>○ Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>○ Prohibitions against child labor and forced labor in supply chains</li> <li>○ Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>○ Zero-tolerance of gender-based violence</li> <li>○ Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> </ul> </li> </ul> <p><i>Expanding Short-Term Employment Opportunities</i></p>

<ul style="list-style-type: none"> <li>• The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in: <ul style="list-style-type: none"> <li>○ Modern tools and techniques where needed</li> <li>○ Brigade internal labor management, accounting, and estimation techniques</li> </ul> </li> <li>• As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative, or other means approved by the Engineer.</li> <li>• Where appropriate, the Contractor will provide training to enhance the skills of local people using on-site apprenticeships and internships</li> <li>• As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduate and members</li> </ul> <p>-</p> <p><i>Local Procurement</i></p> <ul style="list-style-type: none"> <li>• The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.</li> <li>• The Contractor will develop and submit for review and approval by the PMC, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</li> <li>• The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul> <p>-</p>	<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities and project affected communities</p> <p><b>MONITORING</b></p> <p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Gender Integration and Social Inclusion Plan</li> <li>• Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>• Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>• Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>• Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul> <p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities and project affected communities</p> <p>INDICATORS AND SUCCESS CRITERIA:</p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Employment recruitment activities</li> <li>• Employment records of workers</li> <li>• Number, dates, and locations of community engagement meetings</li> </ul>
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<ul style="list-style-type: none"> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>Total annual dollar amount of procurements from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders.</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia</li> <li>Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> MCA-Mongolia or its representative's Social Safeguards Team and Contractor</p> <p><i>Oversight:</i> Engineer</p>

## Management Measure Wells - 9: Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, “Trafficking in Persons” means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”</li> <li>○ Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”</li> <li>○ Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims’ rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
MANAGEMENT MEASURE
Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
<p>The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such</p>



behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

*Counter-Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements..
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

*Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced

- organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.
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#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

MONITORING
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p>LOCATIONS:</p>
<p>All construction sites and temporary construction facilities and project affected communities</p>
<p>INDICATORS AND SUCCESS CRITERIA:</p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes</li> </ul>

<p>clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</p> <ul style="list-style-type: none"> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via: <ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> <li>○ The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence</li> <li>○ Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases</li> <li>○ 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it</li> </ul> </li> </ul> <p><i>Sexual harassment</i></p> <ul style="list-style-type: none"> <li>• The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work</li> <li>• All worker and community complaints about sexual harassment are <ul style="list-style-type: none"> <li>○ addressed confidentially</li> <li>○ addressed in a timely manner and</li> <li>○ resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan</li> </ul> </li> <li>• After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p>	<p><b>MONITORING:</b></p>

<i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team
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## Management Measure Wells - 10: Construction Camp and Temporary Facilities Management

POTENTIAL IMPACT
Risks and impacts that may be associated with workers' accommodation and workplace conditions
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Constitution of Mongolia             <ul style="list-style-type: none"> <li>○ Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code             <ul style="list-style-type: none"> <li>○ Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.</li> </ul> </li> <li>• Mongolian Labor Code             <ul style="list-style-type: none"> <li>○ Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene             <ul style="list-style-type: none"> <li>○ Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.</li> </ul> </li> <li>• Mongolian Law of Fire Safety             <ul style="list-style-type: none"> <li>○ Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.</li> </ul> </li> <li>• Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33             <ul style="list-style-type: none"> <li>○ Prohibits precluding to conclude a contract of legal entities and organizations.</li> </ul> </li> <li>• IFC Performance Standards 2 and 4             <ul style="list-style-type: none"> <li>○ Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking             <ul style="list-style-type: none"> <li>○ Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC and EBRD (2009) guidance at Workers' Accommodation: Processes and Standards<sup>1</sup> <ul style="list-style-type: none"> <li>○ Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning             <ul style="list-style-type: none"> <li>○ Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.</li> </ul>
MANAGEMENT MEASURE
<b>Construction Camp and Temporary Facilities Management</b> The Contractor will: <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> </ul>



<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment</li> <li>• Ensure compliance with IFC and EBRD (2009) guidance at <i>Workers' Accommodation: Processes and Standard</i> for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.</li> <li>• Ensure compliance with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i> for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.</li> <li>• Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i></li> <li>• Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality</li> <li>• Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work</li> <li>• Provide all accommodation sites with sufficient supplies and services</li> <li>• Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition</li> <li>• Conduct visual checks on site to ensure proper housekeeping</li> <li>• Ensure suitable first aid equipment is kept on site, at various appropriate locations</li> <li>• Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required</li> <li>• Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies</li> <li>• Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on: <ul style="list-style-type: none"> <li>○ Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>○ General waste management, housekeeping, first aid practices, and communicable diseases</li> </ul> </li> <li>• Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>○ Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>○ Assigns roles and responsibilities for construction camp and temporary facilities management</li> </ul> </li> </ul>
LOCATIONS:
All areas within and immediately surrounding construction camps and other temporary facilities
<b>MONITORING</b>
Document: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training</li> <li>• Submission and approval of plan</li> </ul>
LOCATIONS:
All areas within and immediately surrounding construction camps and other temporary facilities
INDICATORS AND SUCCESS CRITERIA:
Indicators: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training sessions</li> </ul>



<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Plan approval</li> <li>• Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and annually thereafter</li> <li>• Implementation of above provisions throughout construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training</li> <li>• Document implementation of above provisions</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure Wells - 11: Cultural Heritage Protection

<p><b>POTENTIAL IMPACT</b></p> <ul style="list-style-type: none"> <li>• Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> <li>• Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> <li>• Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Protection of Cultural Heritage <ul style="list-style-type: none"> <li>○ If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>○ Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protect the intangible cultural heritage.</li> </ul> </li> <li>• IFC Performance Standard 8 <ul style="list-style-type: none"> <li>○ Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> </ul> </li> </ul>

- Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.

## OBJECTIVES

- Protect tangible cultural heritage from inadvertent excavation or damage
- Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance

## MANAGEMENT MEASURE

### Cultural Heritage Protection

#### Chance Find Procedure

As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.

Should any unexpected tangible cultural heritage be discovered:

- Cease all work in the immediate area and do not disturb the chance find further, including:
  - Establishing a 30-meter buffer around the chance find
  - Leaving buffer undisturbed until competent cultural heritage specialist assesses the site
  - Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.
- Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area
- Immediately notify the Engineer and the concerned government agencies, specifically the:
  - Office of the governor of the capital city
  - Office of governor of the respective Khan-Uul District or Songinokhairkhan District
  - Local police
  - Institute of Archeology, Mongolian Academy of Sciences
  - Institute of History and Ethnography, Mongolian Academy of Sciences
- Provide the following information to the Engineer and government agencies:
  - Cultural heritage site type—description and photograph(s)
  - Location—description and GPS coordinates
  - Date, time, and details of find
  - Nature of work that led to exposure of or locating the find
- Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation
- Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage
- Restart work only upon written direction from the Engineer

#### Cultural and Sacred Landscape and Places

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

#### Training

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

<ul style="list-style-type: none"> <li>• Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>○ Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above</li> <li>○ Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities</li> <li>○ Assigns roles and responsibilities for training</li> </ul> </li> <li>• Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.</li> </ul>
<p><b>LOCATIONS:</b></p> <ul style="list-style-type: none"> <li>• All work sites</li> <li>• Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred</li> </ul>
<p><b>MONITORING</b></p>
<p>Monitor throughout construction</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Construction work sites during excavation or other ground disturbance</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Communications SST Community Liaison Officers and Engineer</li> <li>• Written directions of Engineer</li> <li>• Actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>• Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Document submission and approval of training plan</li> <li>• Document training of personnel as specified in approved plan</li> </ul>
<p><b>LOCATIONS:</b></p> <ul style="list-style-type: none"> <li>• All work sites</li> </ul>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Chance find of tangible cultural heritage</li> <li>• Excavation or damage of tangible cultural heritage</li> <li>• Cease work decision</li> <li>• Protection of chance find area and tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Submission of training plan</li> <li>• Date and location of training sessions, or as specified in approved plan</li> <li>• Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul>

<p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Training plan approval</li> <li>• All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>	
<p><b>REPORTING:</b></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Report chance find and cease work decision</li> <li>• Report excavation or damage of tangible cultural heritage</li> <li>• Report actions to protect chance find area and tangible cultural heritage</li> <li>• Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Report communications with SST Community Liaison Officers and Engineer</li> <li>• Report directions of Engineer</li> <li>• Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>• Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>• Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> <li>• Continuous during excavation or other ground disturbance</li> </ul> <p>Cultural and Sacred Landscape and Places</p> <ul style="list-style-type: none"> <li>• As required, periodically throughout project construction</li> </ul> <p>Training</p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Personnel training in accordance with timing and frequency specified in approved plan; at minimum, once at beginning of each construction season</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>• Document communications with SST Community Liaison Officers and the Engineer, and written directions of Engineer as they occur</li> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training sessions and personnel start, training, and field deployment as they occur, or as specified in approved plan</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## 3.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure Wells - 5: Emergency Preparedness and Response
- Management Measure Wells - 6: Waste Management
- Management Measure Wells - 10: Construction Camp and Temporary Facilities Management

### Management Measure Wells - 12: Health and Safety Management

POTENTIAL IMPACT
Health and safety risks and impacts on work sites and in construction camps, and in the community
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>○ Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>○ Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>• IFC Performance Standard 4 <ul style="list-style-type: none"> <li>○ Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>○ Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>○ Provides guidance on occupational health and safety and community health and safety.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Identify, assess, manage, and record and communicate all health and safety hazards, and ensure: <ul style="list-style-type: none"> <li>○ Resulting risks to people, property, assets, and the environment are evaluated</li> <li>○ Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical</li> <li>○ Any requirements to mitigate risks are implemented</li> <li>○ Risks and actions to manage them are reported and communicated</li> </ul> </li> </ul>
MANAGEMENT MEASURE
<p><b>Health and Safety Management</b></p> <p>The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.</p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup></li> <li>• Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to: <ul style="list-style-type: none"> <li>○ Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan</li> <li>○ Section 01046 Control of Work, Paragraph 3.05 Open Excavations</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>○ Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets</li> <li>○ Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control</li> <li>○ Protect drinking water sources, whether public or private, at all times</li> <li>● Prepare and implement a traffic control plan for accessing the site, approved by Engineer</li> <li>● Implement all reasonable precautions to protect the health and safety of workers</li> <li>● Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers</li> <li>● Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities</li> <li>● Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident</li> <li>● Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities</li> <li>● Avoid or minimize traffic accidents and promote traffic safety by all project personnel</li> <li>● Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials</li> <li>● Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures</li> <li>● Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice</li> <li>● Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> </ul>
<p>The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:</p>
<ul style="list-style-type: none"> <li>● Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>● Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project</li> <li>● Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply</li> <li>● Specifies: <ul style="list-style-type: none"> <li>○ Site security, including securing of excavations, hazardous materials, etc.</li> <li>○ Confined space safety procedures</li> <li>○ Excavation and trenching safety measures</li> <li>○ First aid facilities, equipment, and materials</li> <li>○ Protective clothing and safety equipment</li> <li>○ HIV/AIDS awareness program</li> <li>○ Covid-19 awareness program</li> <li>○ Counter-trafficking in persons program</li> <li>○ Health and Safety management monitoring and reporting</li> </ul> </li> <li>● Assigns roles and responsibilities for health and safety management</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All project sites and surrounding communities</p>
<p><b>MONITORING</b></p>
<p>Document submission and approval of plan</p>



<b>LOCATIONS:</b>	
All project sites and surrounding communities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
Indicators:	
<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i>	<i>Implementation:</i>
<ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul>
	<i>Reporting:</i>
	<ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> Contractor	<i>Implementation:</i> Contractor
<i>Oversight:</i> MCA-Mongolia or its representative	<i>Reporting:</i> Contractor
	<i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## 3.6 Education, Training, and Community Outreach

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure Wells - 5: Emergency Preparedness and Response
- Management Measure Wells - 6: Waste Management
- Management Measure Wells - 7: Labor Management
- Management Measure Wells - 8: Gender Integration and Social Inclusion
- Management Measure Wells - 9: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Wells - 10: Construction Camp and Temporary Facilities Management

- Management Measure Wells - 11: Cultural Heritage Protection
- Management Measure Conveyance - 12: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### **Management Measure Wells - 13: Stakeholder Engagement, Community Consultation, and Grievance Redress**

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>○ Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>○ Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b></p> <p>The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.</p> <p><b>Stakeholder Engagement</b></p> <ul style="list-style-type: none"> <li>• The Contractor will: <ul style="list-style-type: none"> <li>➤ Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework</li> <li>➤ Maintain, revise, and update the project Stakeholder Engagement Matrix</li> <li>➤ Document all stakeholder engagement activities in the Stakeholder Engagement Matrix</li> </ul> </li> </ul> <p><b>Community Consultation</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will <ul style="list-style-type: none"> <li>➤ Introduce Contractor's officers to communities</li> <li>➤ Monitor and supervise Contractor contacts with communities and other stakeholders</li> <li>➤ Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted</li> </ul> </li> </ul>

- In coordination with the MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the MCA- Mongolia Grievance Redress Mechanism, and other issues that arise during consultation
  - Document all community consultation activities in the Stakeholder Engagement Matrix

### **Grievance Redress**

- The MCA-Mongolia or its representative will supervise, and monitor participation by all parties
- The Contractor will:
  - Implement the Grievance Redress Mechanism consistent with Annex A
  - Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism
  - Document all grievance redress actions in the Stakeholder Engagement Matrix
  - Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer
  -

### **LOCATIONS:**

All construction sites and temporary construction facilities

### **MONITORING**

#### **MCA-Mongolia or its representative**

- Monitor Contractor contacts with stakeholders and communities
- Monitor participation by all parties in Grievance Redress Mechanism

#### **Contractor**

- Document all stakeholder engagement activities
- Document all community consultation activities
- Record results of Contractor's community consultation activities
- Document all grievance redress activities under the Grievance Redress Mechanism

### **LOCATIONS:**

All construction sites and temporary construction facilities

### **INDICATORS AND SUCCESS CRITERIA:**

#### **Indicators:**

- Number, content, and outcome of:
  - Stakeholder engagement activities
  - Community consultation activities
  - Grievance redress actions

#### **Success Criteria:**

- Successful outcome of:
  - Stakeholder engagement activities
  - Community consultation activities
- Resolution of grievances

### **REPORTING:**

- Update project Stakeholder Engagement Matrix
- Summarize other activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern
- Define activities planned during next reporting period

### **SCHEDULE**

<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

### 3.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

1. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
2. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the

cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## **4 Implementation Work Plan and Schedule**

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.

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## Annex A – Grievance Resolution Mechanism

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The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>88</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

1. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
2. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>89</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>90</sup> References available upon request to MCA.

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<sup>88</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>89</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>90</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017



The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.
- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

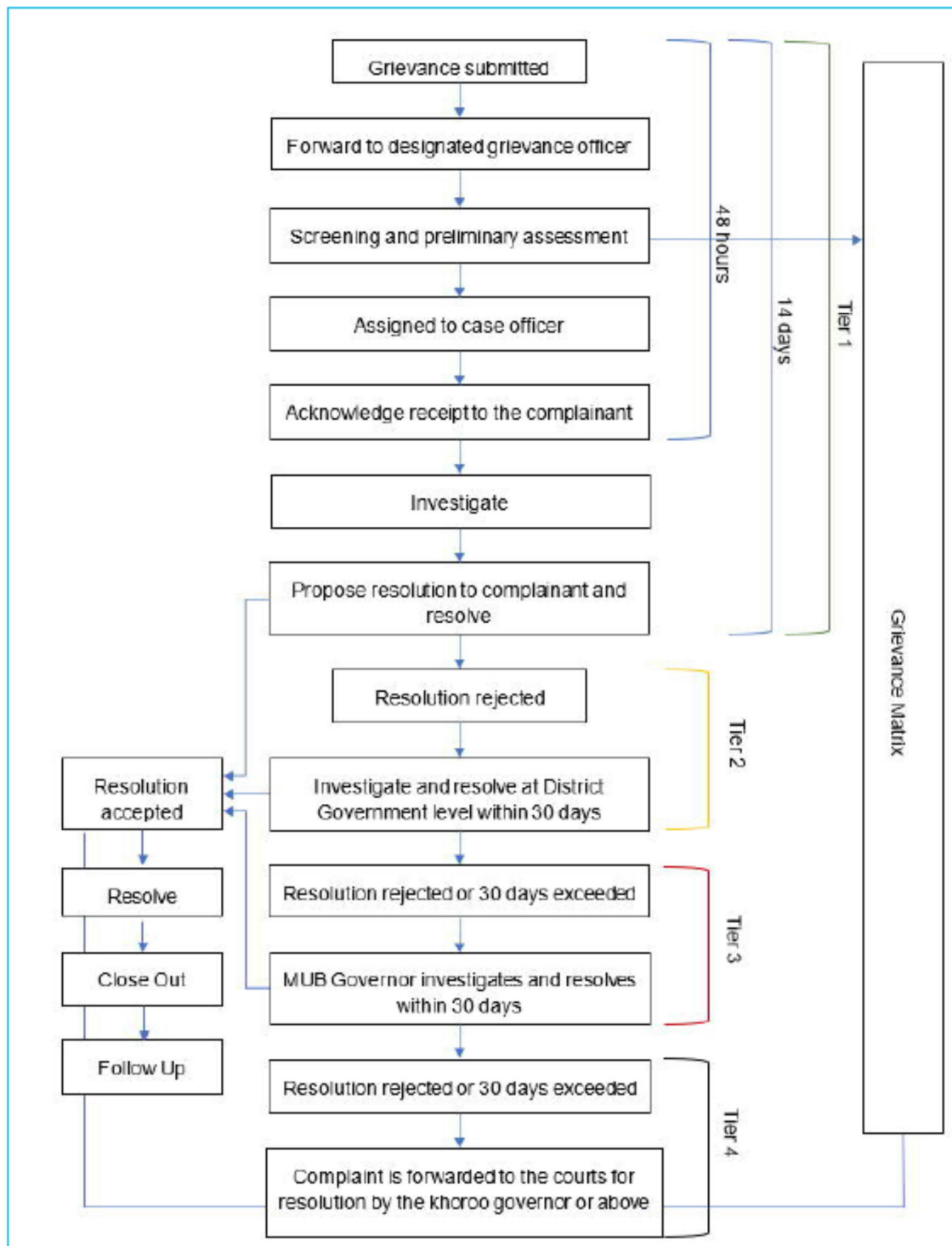
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM



## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contact and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both a MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.

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# **Annex B – Public Consultation and Stakeholder Engagement Plan for BWSE**

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## **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

## **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

1. Staffing and resources
2. Stakeholder Identification and Analysis
3. Information Disclosure
4. Stakeholder Consultation
5. Partnerships
6. Grievance Management
7. Stakeholder Involvement in Project Monitoring
8. Reporting to Stakeholders
9. Management Functions



## **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social licence to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc, filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

## **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

## **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions

6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

1. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
2. Observations by affected parties, triangulated to strengthen validation,
3. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
4. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen

support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

1. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
  2. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
  3. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
  4. Make monitoring results publicly available, especially reports of any external monitors.
  5. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
  6. Derive an SOP for reporting to stakeholders.
- 50.

## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

1. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
2. The hiring and training of community liaison officers
3. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
4. Input and suggestions received from stakeholders on project design and proposed mitigation measures
5. Grievance mechanisms that capture and respond to stakeholder concerns
6. The involvement of local stakeholders in project monitoring
7. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals

- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field- level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes –stakeholder relations becomes a collective responsibility.



## J.2 CP-2: Advanced Water Purification Plant (AWPP)

### 1. Introduction

This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-2: Advanced Water Purification Plant (AWPP) of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>91</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance, which will be conducted by others and is not included in the version of this ESMP which is being issued for construction bidding

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight

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<sup>91</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as Technical Specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.

### **Technical Specifications, Division 1 – General Requirements**

#### **Section 01030, Special Requirements**

- Site-specific health and safety plan
- Site-specific emergency action plan
- Site-specific hazardous waste management plan
- Backfilling operations following pipe laying
- Application of clean water to control dust
- Removal and legal disposal of unsuitable material and excess material
- Disposal of debris
- Preconstruction Video Recording of Entire Site
- Detours and Road Accessibility
- Owner Obtained Permits

#### **Section 01046, Control of Work**

- Hours of Construction
- Safeguarding of Open Excavations
- Occupying Private Land
- Protection of Streets
- Care and Protection of Property

#### **Section 01063, Miscellaneous Requirements**

- Traffic Control
- Maintain Flows of Existing Utilities

#### **Section 01110, Environmental Protection Procedures**

- Protection of Existing Structures and Utilities
- Cleanup and Disposal of Excess Material
- Prevention of Environmental Pollution
- Erosion Control
- Protection of Streams, Wetlands and Surface Water
- Protection of Land Resources
- Protection of Air Quality
- Noise Control

#### **Section 01500, Temporary Facilities**

- Field Offices
- Visitor Center
- Internet Service
- Telephone Service
- Temporary Perimeter Fence
- Potable Water for Construction and Domestic Purposes
- Temporary Electrical
- Temporary Sanitary Conveniences
- Barricades
- Temporary Heat
- Shelter and Protection of Materials
- Site Security

#### **Section 01568, Erosion Control, Sedimentation & Containment of Construction Materials**

- Erosion Control

#### **Section 01610, Delivery, Storage and Handling**

- Storage and Handling of Hazardous Materials

#### **Section 01700, Contract Closeout**

- Final Cleaning

#### **Section 01710, Cleaning Up**

- Cleaning Up Project Site

### **Technical Specifications, Division 2 – Site Work**

#### **Section 02100, Site Preparation**

- Special Requirements
- Contractor shall repair or replace any structures that are damaged
- Disposal of waste/surplus materials
- Inform Owner if there were archeological findings during site preparation
- Clearing, Grubbing, Tree & Stump Removal
- Disposal of Waste Materials
- Sediment and Erosion Control

#### **Section 02140, Dewatering**

- Dewatering

#### **Section 02210, Earth Excavation, Backfill, Fill and Grading**

- Excavation
- Separation of Excavated Material for Reuse
- Trench Excavation
- Reuse and Disposal of Surplus Excavated Materials
- Care and Restoration of Property
- Backfilling

#### **Section 02230, Site Clearing**

- Clearing and Grubbing

#### **Section 02268, Erosion Control Barrier**

- Erosion Control Barrier

#### **Section 02480, Landscaping**

- Plants
- Loam and Seed
- Planting
- Maintenance of Seeded Areas and Planting

#### **Section 02483, Planting Operations**

- Planting and Maintenance of Trees, Shrubs and Ground Cover

#### **Section 02485, Loaming and Seeding**

- Loaming and Seeding of disturbed area
- Wetland Seed Mixture
- Straw for Erosion Control

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and schedule for implementing the ESMP.

## 2. Pre-Construction Phase

### 2.1 Responsibilities During Pre-Construction

#### 2.1.1 MCA-Mongolia

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) and coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### 2.1.2 Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring of pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by

an acceptable CESMP and must be permitted in accordance with all applicable permitting requirements. The Contractor will need to negotiate with and potentially compensate landowners for temporary use of land. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of the ESMP.

The Contractor will designate an Environmental and Social Performance Manager as a key staff. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social, and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and relevant monitoring requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions proposed by the Contractor, as needed, to reflect field conditions with the approval of the Engineer.

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works.

Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan and Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Stakeholder Engagement Plan



- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **2.1.3 Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored. The CESMP, at a minimum, shall include the following plans:

- Environmental Management Plan
- Waste Management Plan
- Social and Gender Inclusion Plan
- Health and Safety Management Plan
- Education, Training, and Community Outreach Plan
- Risk Control and Emergency Response Plan
- Monitoring and Verification, and Maintenance Actions Plan

#### **2.1.3.1 Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site

- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring
- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian Law on Labor, Law on Promotion of Gender Equality, and other relevant employment laws. Ensure each employee has a written contract and is made aware of and signs the Worker Code of Conduct, and ensure compliance with the Labor Management Plan
- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response
  - Waste Management
  - Labor Management
  - Gender Integration and Social Inclusion
  - Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
  - Stakeholder Engagement, Community Consultation, and Grievance Redress
  - Construction Camp and Temporary Facilities Management
  - Cultural Heritage Protection
  - Health and Safety Management

When preparing the site-specific CESMP, it will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

### **2.1.3.2 Management Acknowledgements**

#### **5) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Project Director attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions

in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

## 6) Statutory Understanding and Compliance

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

a) All current environmental laws and regulations, related to, but not limited to, the following:

- Noise
- Vibration
- Air pollution
- Water contamination
- Solid and hazardous waste disposal
- Waste disposal
- Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
- Use of explosives;
- Protection of public traffic
- Historical, cultural, and archaeological monuments/sites
- Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.

b) All current labor laws and laws related to, but not limited to, the following:

- Contract of employment and labor disputes
- Working conditions
- Management, monitoring, and supervision
- Gender-based discrimination in employment
- Child labor
- Trafficking in persons
- Gender-based violence
- Sexual harassment

c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

## 7) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

## 8) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included in implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans,

documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.

- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

### **2.1.3.3 Organization and Staffing**

#### **4) Organization Chart**

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

#### **5) Identification of Responsibilities**

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

- a) **Environmental and Social Performance Manager**

The Environmental and Social Performance Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Performance Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

- b) **Social and Gender Manager**

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be

empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative regarding the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with the MCA-Mongolia or its representative over community contacts
- Liaise with the MCA-Mongolia or its representative to implement and assist in resolution of grievances

- Inform the MCA-Mongolia or its representative of employment vacancies and recruit through the Ministry of Labor offices and process
- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project GRM; documenting, reporting, and taking part in finding solutions

## 6) Appointments

The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager
- Health and Safety Manager
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The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, Health and Safety Manager, and Social Safeguards Officer prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager, will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

### **2.1.3.4 Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities



#### 4) Environmental, Social and Gender, and Health and Safety Reports

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.

**Table 1 Summary of Report Requirements**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> </ul>

Report	Submission Schedule	Content
		<ul style="list-style-type: none"> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence, and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period, grievances registered and resolved</li> <li>• Grievances registered and resolved.</li> </ul>

## 5) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes:

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons for sex, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the Contractor's organization require reporting to the MCA-Mongolia or its representative's Social Safeguards Team. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties, and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combatting Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction."

## 6) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.

- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### 2.1.3.5 Environmental, Social and Gender, and Health and Safety Provisions

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## 2.2 Environmental Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.3 Waste Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.4 Social and Gender Inclusion

### Management Measure AWPP - 1: Labor Management

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> </ul>

<ul style="list-style-type: none"> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> <li>- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.</li> <li>- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.</li> <li>- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to</li> </ul> </li> </ul>



<p>any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.</p> <ul style="list-style-type: none"> <li>- Prohibits employment of child labor.</li> <li>• Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>- Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.</li> </ul> </li> <li>• Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>- Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees</li> <li>- Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project</li> <li>- Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level</li> <li>- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>• Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment <ul style="list-style-type: none"> <li>- Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.</li> </ul> </li> <li>• Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy <ul style="list-style-type: none"> <li>- Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”</li> </ul> </li> <li>• Ministry of Labor and Social Welfare Order (2016) <ul style="list-style-type: none"> <li>- Expanded the types of hazardous work prohibited for children under the age of 18 to include construction</li> </ul> </li> <li>• International Labor Organization fundamental conventions, and International Human Rights instruments and conventions</li> </ul>	<div style="background-color: #e0f0ff; padding: 2px;"><b>OBJECTIVES</b></div> <p>The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.</p> <ul style="list-style-type: none"> <li>• Promote fair treatment, non-discrimination, and equal opportunity of workers</li> <li>• Promote local labor opportunities and procurement from local suppliers</li> <li>• Target women’s employment as 30% of all labor at each skill/occupational level</li> <li>• Establish and maintain and improve a constructive worker-management relationship</li> <li>• Protect workers, including “vulnerable” categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain</li> <li>• Avoid the use of forced labor or trafficked labor</li> <li>• Maximize the beneficial impact of the project on the affected communities</li> </ul> <div style="background-color: #e0f0ff; padding: 2px;"><b>MANAGEMENT MEASURE</b></div> <div style="background-color: #e0f0ff; padding: 2px;"><b>Labor Management</b></div> <p>The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:</p> <ul style="list-style-type: none"> <li>• Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs</li> </ul>
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- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and, youth, and disadvantaged groups, 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level, and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts
- The Contractor is encouraged to:
  - Create pay bands for each category of worker to help ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's

Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university  
The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor’s Anti-Sexual Harassment Policy and notification of the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers’ Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a workers’ grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor’s Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor’s Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor’s zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor’s Social Safeguards Officer contact the MCA-Mongolia or its representative’s SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation

- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor’s responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor’s employment forecast and recruitment strategy, and the Contractor’s Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor’s Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor’s TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative’s SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative’s SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
  - These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative’s Social Manager

### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer’s written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor’s comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor’s Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers’ Code of Conduct

<ul style="list-style-type: none"> <li>Is consistent and compliant with: <ul style="list-style-type: none"> <li>Mongolian Law on Labor</li> <li>Relevant aspects of the Conditions of Contract, as well MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>The MCC Policy on Counter-Trafficking in Persons</li> </ul> </li> <li>Assigns roles and responsibilities for labor management</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged and other excluded groups</li> <li>Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites and temporary construction facilities</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Required plans written, approved, and implemented</li> <li>Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>Use of written contracts with defined pay scales by employment activity</li> <li>Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> <li>Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> <li>Number of apprenticeship and internships established and completed</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of:</li> </ul>

<ul style="list-style-type: none"> <li>○ 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor on site or with any contract activity</li> <li>○ Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>○ Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and “vulnerable” and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Apprenticeships and internships Internments established and completed for each construction season</li> <li>○ All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>• 100% of employees and sub-contractors sign the worker code of conduct</li> <li>• Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>• Implementation of above provisions throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training as it occurs</li> <li>• Document implementation of above provisions as it occurs</li> <li>• Maintain employee records as required above</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative



## Management Measure AWPP - 2: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment and improved conditions of employment for women</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> <li></li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>Encourages contractors to employ women as at least 30% of workers</li> <li>Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1 <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2 <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
OBJECTIVES
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <ul style="list-style-type: none"> <li>To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> </ul>

<ul style="list-style-type: none"> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impacts of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and District and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</li> <li>○ Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> <li>- <i>Community engagement</i></li> <li>• The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>○ Efforts to hire local labor and the Contractor's employment forecast</li> <li>○ Efforts to maximize women's employment</li> <li>○ Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>○ Prohibitions against child labor and forced labor in supply chains</li> <li>○ Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>○ Zero-tolerance of gender-based violence</li> <li>○ Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> <li>- <i>Expanding Short-term Employment Opportunities</i></li> <li>• The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in: <ul style="list-style-type: none"> <li>○ Modern tools and techniques where needed</li> <li>○ Brigade internal labor management, accounting, and estimation techniques</li> </ul> </li> <li>• As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.</li> <li>• Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships. As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with secondment to training programs such as Technical and Vocational Education and Training Centers and</li> </ul>

<p>professional associations and to draw workers from among their graduates and members, etc..</p> <p>-</p> <p><i>Local Procurement</i></p> <ul style="list-style-type: none"> <li>The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.</li> <li>The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</li> <li>The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>Monitor Contractor Gender Integration and Social Inclusion Plan</li> <li>Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Employment recruitment activities</li> <li>Employment records of workers</li> <li>Number, dates, and locations of community engagement meetings</li> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses, disaggregated by those in in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>

<ul style="list-style-type: none"> <li>Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and “vulnerable” groups at a target to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST)</li> <li>All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor’s Sexual Harassment Incident Referral and Reporting Plan</li> <li>Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative’s Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> Engineer

### Management Measure AWPP -3: Counter Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- **MCC Counter-Trafficking in Persons Policy (C-TIP Policy)**
  - States, “Trafficking in Persons” means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”
  - Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the foregoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”
  - Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.
- **Mongolian Law on Promotion of Gender Equality**
  - Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.
- **Mongolian Law to Combat Human Trafficking**
  - The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims’ rights.

## OBJECTIVES

- To prevent incidence of trafficking of persons for sex by project employees
- To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites
- To prevent sexual harassment at all construction sites and temporary construction facilities
- To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace
- To prevent incidences of gender-based violence involving workers

## MANAGEMENT MEASURE

### Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers’ induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

#### *Counter-Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer’s written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers’ passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.

- Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy



<p>prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.</p> <ul style="list-style-type: none"> <li>○ The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.</li> <li>○ The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.</li> </ul> <ul style="list-style-type: none"> <li>• Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contactor or other workers to dismiss the complaint.</li> <li>• The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.</li> <li>• The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.</li> <li>• The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.</li> <li>• The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment. <ul style="list-style-type: none"> <li>○ Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.</li> <li>○ Training shall address <ul style="list-style-type: none"> <li>▪ Attitudes to and prevention of sexual harassment in the workplace</li> <li>▪ Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons</li> <li>▪ Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> </ul> </li> </ul> </li> <li>• Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> <li>•</li> </ul>	<div style="background-color: #e0f0ff; padding: 5px;"><b>LOCATIONS:</b></div> <p>All construction sites and temporary construction facilities and project affected communities</p> <div style="background-color: #e0f0ff; padding: 5px;"><b>MONITORING</b></div> <p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> <li>•</li> </ul> <p>Contractor:</p>
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<ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:</li> </ul>

<ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> <li>○ The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence</li> <li>○ Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases</li> <li>○ 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it</li> </ul>	
<p><b>Sexual harassment</b></p> <ul style="list-style-type: none"> <li>• The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work</li> <li>• All worker and community complaints about sexual harassment are <ul style="list-style-type: none"> <li>○ addressed confidentially</li> <li>○ addressed in a timely manner and</li> <li>○ resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan</li> </ul> </li> <li>• After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor <i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team</p>

## 2.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training and community outreach requirements:

- Management Measure AWPP - 1: Labor Management
- Management Measure AWPP - 2: Gender Integration and Social Inclusion (GSI)
- Management Measure AWPP - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### Management Measure AWPP - 4: Stakeholder Engagement, Community Consultation, and Grievance Redress

POTENTIAL IMPACT
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
MANAGEMENT MEASURE
<p><b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b></p> <p>The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.</p> <p><b>Stakeholder Engagement</b></p> <ul style="list-style-type: none"> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirement described in Annex B of the ESMP</li> </ul>

- At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify:
  - Contractor's responsibilities and participation in community consultation, specifying:
  - A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities
  - How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix
  - How information is to be shared with the communities and other project partners
  - Protocols for conducting, recording, and disseminating the results of community consultation
- The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of the ESMP

### **Community Consultation**

- The MCA-Mongolia or its representative will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation
  - Actively promote awareness and disclose information in affected communities on the following:
    - Purpose, nature, and scale of the project
    - Duration of proposed project activities
  - Record results of Contractor's community consultation activities
  - Document all community consultation activities in the Stakeholder Engagement Matrix

### **Grievance Redress**

- The MCA-Mongolia or its representative will:
  - Supervise, and monitor participation by all parties
- The Contractor will:
  - Develop and implement the Grievance Redress Mechanism consistent with Annex A
  - Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism
  - Document all grievance redress actions
  - Report on the Grievance Redress Mechanism to the Engineer

#### **LOCATIONS:**

All construction sites and temporary construction facilities and project affected areas

### **MONITORING**

#### **MCA-Mongolia or its representative**

- Monitor Contractor contacts with stakeholders and communities
- Monitor participation by all parties in Grievance Redress Mechanism

#### **Contractor**

- Document all Contractor's stakeholder engagement and consultation activities
- Document all grievance redress activities under the Grievance Redress Mechanism

#### **LOCATIONS:**

All construction sites and temporary construction facilities and project affected areas

INDICATORS AND SUCCESS CRITERIA:	
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> </ul> </li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
SCHEDULE	
MANAGEMENT MEASURE:	MONITORING:
<p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
RESPONSIBILITY	
MANAGEMENT MEASURE:	MONITORING:
<p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## 2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## 2.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:



3. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
4. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## 3 Construction Phase

### 3.1 Responsibilities During Construction

#### 3.1.1 MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) to coordinate with the Contractor during the construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### 3.1.2 Contractor

Unless otherwise specified for individual management measures, the construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards, and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit a CESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## 3.2 Environmental Management

### Management Measure AWPP -5: Emergency Preparedness and Response

#### POTENTIAL IMPACT

Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection <ul style="list-style-type: none"> <li>- Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>- Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>- Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>- Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>- Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> </ul> </li> <li>• Mongolian Criminal Code <ul style="list-style-type: none"> <li>- Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> </ul> </li> <li>• IFC Performance Standards 1, 3, and 4 <ul style="list-style-type: none"> <li>- Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>- Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Emergency Preparedness and Response</b> The Contractor will: <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer’s written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul> <b>Hazardous Materials Management</b> <ul style="list-style-type: none"> <li>• Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials</li> </ul>

- Develop prioritized material-specific handling procedures and training requirements as necessary according to risk
- Assign an officer to manage and advise on hazardous materials management

#### *Handling*

- Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities
- Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)
- Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells

#### *Transport*

- Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials
- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

#### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

### **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

#### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.

- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.
- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.

### **Emergency Preparedness and Response Plan**

Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan
- Specifies:
  - Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment
  - Potential emergencies and key areas prone to emergency situations
  - Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.
  - Actions to be taken prior to an emergency—i.e., preventive and preparatory measures
  - Actions to be taken during an emergency—i.e., response measures
  - Actions to be taken after an emergency—i.e., recovery and assessment measures
  - Contact lists for emergency situations
  - Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas
  - Assigns roles and responsibilities for emergency preparedness and response
- Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities
- In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof

#### **LOCATIONS:**

All construction sites and temporary construction facilities

#### **MONITORING**

Document submission and approval of plan

#### **LOCATIONS:**

All construction sites and temporary construction facilities

#### **INDICATORS AND SUCCESS CRITERIA:**

Indicators:

- Submission of plan

Success Criteria:

- Plan approval

#### **REPORTING:**



<ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### Management Measure AWPP -6: Mongolian Marmot Protection and Habitat Restoration

<b>POTENTIAL IMPACT</b>
Disturbance of endangered Mongolia marmot ( <i>Marmota sibirica</i> ) and loss and disturbance of marmot habitat
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires researching and establishing the potential for State and regional development, the restoration, breeding and raising of endangered animals, protection of soil, water, and air, and for humans to live in a healthy.</li> </ul> </li> <li>Mongolian Law on Fauna               <ul style="list-style-type: none"> <li>Requires the approval of the government based on the conclusions of an environmental impact assessment of the construction of industrial plants, power stations within the territory of extremely rare fauna.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Prohibits implementing any activities that leads to a net reduction in the national/regional population of any Critically Endangered or Endangered species over a reasonable period.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Minimize disturbance of Mongolian marmots</li> <li>Habitat restoration to achieve a net gain in Mongolian marmot habitat</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Mongolian Marmot Protection and Habitat Restoration</b>  <b>Protection and Habitat Restoration</b> MCA-Mongolia will, with reference to the figure below: <ul style="list-style-type: none"> <li>Designate construction-phase marmot protection zone extending a minimum of 200 meters from the outermost flight burrows</li> <li>Prohibit the operation of any motorized vehicles, including cars and all-terrain vehicles, and restrict foot traffic within construction-phase marmot protection zone by MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel</li> </ul>

- Develop and implement marmot protection training to be required of all construction-phase MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel and visitors to project facilities and construction sites in the vicinity of the AWPP.

The Contractor will be responsible for:

- Design and construction of the following:
  - Approximately 500-meter long, 2-meter high earthen berm between existing marmot burrow clusters and the proposed AWPP, located no closer than 100 meters from the flight burrows and planted with native shrubs and perennial plants, to limit disturbance of marmots
  - Approximately 25-meter long, 1-meter high permeable rock berm across intermittent, seasonal stream that divides the existing marmot habitat to arrest gully
  - Plant native shrubs and perennial plants in an approximately 25,000-square meter Mongolian marmot habitat restoration area
  - Install Mongolian marmot warning and interpretive signs to be placed at the natural car parking facility

MCA-Mongolia will employ or contract an experienced biodiversity specialist to develop and implement the following Mongolian marmot construction-phase monitoring and long-term protection program

### **Construction-Phase Monitoring and Long-term Protection**

Prepare, submit, and implement Mongolian Marmot Monitoring and Evaluation Plan for the Engineer's written approval, to monitor and evaluate Mongolian marmot population density and structure, reproduction, and mortality in the vicinity of the proposed AWPP and replacement access road and pedestrian path to the Monument to Terror Victims, and existing and proposed walking trail to the sacred ovoo on Songinokhairkhan Mountain. The plan will specify roles and responsibilities for marmot monitoring and evaluation.

The plan may include but not be limited to the following, as determined by the biodiversity specialist and approved by the Engineer:

#### *Mapping*

- Burrow clusters
- Family and individual home ranges
- Vegetation
- BWSE-related and other human encroachment

#### *Monitoring activities*

- Use of drone equipped with thermal imaging camera
- Direct observation aided by binoculars and spotting scopes
- Use of automatic camera trap
- Capture with or without marking

#### *Monitoring parameters*

- Burrow cluster population
- Age of individuals
- Sex of individuals
- Home range size
- Number of families
- Family composition
- Number of pups
- Activity/Behavior
- Predation
- Survival and mortality
- Total population
- Age and sex distribution of population

Observations are to be repeated during the morning and evening active periods.

Monitoring data for the selected parameters will be evaluated as construction, and operation and maintenance progress for changes attributed to loss of marmot habitat or disturbance of marmots. The

monitoring and evaluation plan will specify impact indicators and impact criteria determined by the biodiversity specialist and approved by the Engineer.

Exceedance of any of the impact criteria will trigger, ***independent of this management measure***, preparing, submitting, and implementing protective actions, in addition to those specified above, formulated to avoid, minimize, or offset the observed adverse impact.

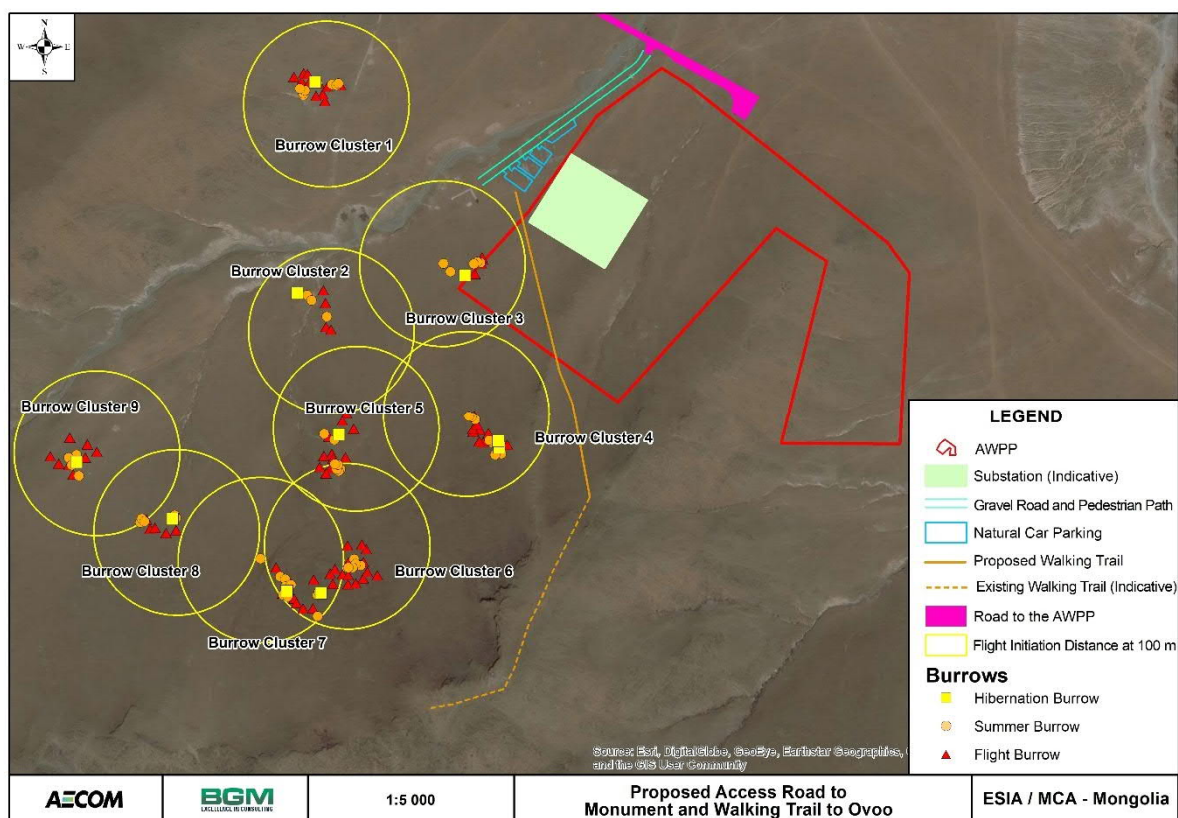
Such actions may include the following, as well as other measures recommended by the biodiversity specialist:

- Constructed buffers; e.g., vegetated earth berms
- Rock piles where marmots can watch for predators, thermoregulate, and dig burrows
- Spill protection measures
- Permanent Mongolian marmot protection zone
- Driving restrictions; e.g., prohibit or control off-road driving, set speed limits, restrict non-essential traffic to daytime
- Marmot protection and avoidance training
- Warning and interpretive signage
- Supplemental feeding to increase reproduction and survival, and attract marmots away from roads

The Contractor will be requested to provide a quotation to implement such actions identified by the biodiversity specialists, should the impact criteria be triggered.

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the following figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults:



#### MONITORING

Document submission and approval of plan

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoos on Songinokhairkhan Mountain, as located on the above figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults

#### INDICATORS AND SUCCESS CRITERIA:

##### Indicators:

- Submission of construction-phase monitoring and long-term protection plan
- Collection and evaluation of Mongolian marmot population density and structure, reproduction, and mortality data
- Specific impact criteria and indicators specified in approved plan

##### Success Criteria:

- Monitoring and protection plan approval
- Identification of and timely response to changes attributed to loss of marmot habitat or disturbance of marmots

#### REPORTING:

- Report communications and written approval of Engineer of Construction-Phase Monitoring and Long-Term Protection Plan
- Report monitoring activities and data evaluation findings
- Report impact criteria exceedances and recommended protective actions to be implemented
- Summarize other activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern
- Define activities planned during next reporting period

#### SCHEDULE

##### MANAGEMENT MEASURE:

##### Implementation:

- Annual, beginning prior to construction mobilization and continuing throughout construction, commissioning, and contract operations period Year 1 and Year 2
- Late March to late September monitoring season, comprising four monitoring periods:
  - Late March/early April (post hibernation)
  - Late June/early July (pups feeding outside burrows)
  - Mid-August (newborn survival and mortality)
  - Late September (pre hibernation)

##### MONITORING:

##### Implementation:

- Document communications and written approval of Engineer as they occur

##### Reporting:

- Monthly in CESMP update

#### RESPONSIBILITY

##### MANAGEMENT MEASURE:

**Implementation:** MCA-Mongolia and Biodiversity specialist employed by or contracted to MCA-Mongolia; construction by Contractor  
**Oversight:** MCA-Mongolia or its representative

##### MONITORING:

**Implementation:** Biodiversity specialist  
**Reporting:** Biodiversity specialist and Contractor  
**Oversight:** MCA-Mongolia or its representative

## 3.3 Waste Management

### Management Measure Waste -7: Waste Management

#### POTENTIAL IMPACT

Risks and adverse impacts of handling, storing, treating, and disposing of waste
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hazardous and Toxic Chemicals <ul style="list-style-type: none"> <li>◦ Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>• Mongolian Law on Sanitation <ul style="list-style-type: none"> <li>◦ Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>◦ Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> <li>• Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste</li> <li>• Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).</li> <li>• Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes <ul style="list-style-type: none"> <li>◦ Requires providing personal protective equipment to the organization's waste management officer.</li> </ul> </li> <li>• Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste</li> <li>• Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).</li> <li>• IFC Performance Standards 3 and 4 <ul style="list-style-type: none"> <li>◦ Encourages recovering and reusing waste in a manner that is safe for human health and the environment.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>◦ Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes</li> </ul>
MANAGEMENT MEASURE
<p><b>Waste Management</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements: <ul style="list-style-type: none"> <li>• Paragraph 1.04.E Hazardous Waste Management Plan</li> <li>• Paragraph 1.14 Disposal of Excess Material</li> <li>• Paragraph 1.21 Disposal of Debris</li> </ul> </li> <li>• Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures: <ul style="list-style-type: none"> <li>• Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner</li> <li>• Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris</li> </ul> </li> <li>• Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling: <ul style="list-style-type: none"> <li>• Paragraph 1.05.C Storage and Protection</li> </ul> </li> </ul>

- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps
- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor's site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter



<ul style="list-style-type: none"> <li>The Contractor will prepare and submit for the Engineer's written approval a site-specific Waste Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>Assigns roles and responsibilities for waste management</li> <li>Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available</li> </ul> </li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>MONITORING</b></p>
<p>Document:</p> <ul style="list-style-type: none"> <li>Provision, maintenance, and/or updating of: <ul style="list-style-type: none"> <li>MSDSs</li> <li>Secondary containment capacity for all storage of liquid hazardous materials</li> <li>Tanks and sumps inspection records</li> <li>Spill kits</li> <li>First aid</li> <li>Waste inventory</li> <li>Waste management training</li> </ul> </li> <li>Submission and approval of site-specific Waste Management Plan</li> </ul>
<p><b>LOCATIONS:</b></p> <p>All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Submission of site-specific Waste Management Plan</li> <li>Volumes of waste generated</li> <li>Volumes of waste sent for off-site recycling</li> <li>Number of reported non-compliances with the controls identified in the plan</li> <li>Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>Number of reported waste incidents</li> <li>Number of waste related community complaints</li> <li>Instances of off-site contamination identified</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Approval of site-specific Waste Management Plan</li> <li>Minimize volume of waste generated</li> <li>Maximize volume of waste sent for off-site recycling</li> <li>Zero: <ul style="list-style-type: none"> <li>Reported non-compliances with the controls identified in the plan</li> <li>Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>Reported waste incidents</li> <li>Number of waste related community complaints</li> <li>Instances of off-site contamination identified</li> </ul> </li> </ul>
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> </ul>

<ul style="list-style-type: none"> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Management measure and plan implementation throughout construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## 3.4 Social and Gender Inclusion

### Management Measure AWPP -8: Labor Management

<b>POTENTIAL IMPACT</b>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> <li>Women's short-term employment in construction and engineering-related work</li> <li>Potential alleviation of poverty in local area</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>  <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Constitution of Mongolia               <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code               <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>Mongolian Law on Gender Equality               <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> </ul>

- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction
- Mongolian Law on Minimum Wage
  - Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.
- Mongolian Law on the Protection of the Rights of the Child
  - Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children
- Mongolian Law on Social Protection of Disabled Persons
  - Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- Mongolian Law on Combating Human Trafficking
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
  - Prohibits employment of child labor.
- Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent trafficking in persons and related activities and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP..
- Millennium Challenge Account Social and Gender Integration Plan (SGIP)

- Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
- Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
- Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
- Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy
  - Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
- Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
- International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities
- Achieve a target of women’s employment as 30% of all labor at each skill/occupational level
- Establish and maintain, a constructive worker-management relationship
- Protect workers, including “vulnerable” categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor’s cooperation with the local District Labor Offices
- Facilitate the publication of vacancies and procurements within affected communities
- Facilitate the holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local business and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors’ engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships

The Contractor will:

- Fully comply with the requirements of this management measure
- Perform the work in accordance with relevant sections of the ESMP

### Access to Employment

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth; 2) achieve a target of women's employment at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), and publicize a fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university
- The Contractor shall note contract clauses on "Gender," "Engagement of Staff and Labor," "Foreign Personnel," "Prohibition of Forced or Compulsory Labor," "Prohibition of Harmful Child Labor," "Employment Records of Workers," and "Non-Discrimination and Equal Opportunity."

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and hold procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
  -
- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, and apprenticeships
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)



- Gender-based violence
- Contractor's Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
- Using the internal Grievance Mechanism for allegations of gender-based discrimination
- Rights to have access to local festivals
- Cultural sensitivities, and social norms and practices in each area
- Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
- Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan
- Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues.
- These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager

#### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the MCC Gender Policy coordinated and agreed with the MCA-Mongolia or its representative's SST and operated by the Contractor's Social Safeguards Officer
  - The MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

MCA-Mongolia or its representative's SST:

- Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor
- Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups

<ul style="list-style-type: none"> <li>Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's labor management responsibilities, with all data and statistics disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Required plans written, approved, and implemented</li> <li>Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>Use of written contracts with defined pay scales by employment activity</li> <li>Employment recruitment activities, and interactions with local employment offices and communities, professional associations, TVET centers</li> <li>Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>Number of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> <li>Number of apprenticeship and internships established and complete</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>Zero tolerance of child labor – no child labor on site</li> <li>Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguard Team (SST)</li> <li>Apprenticeships and internships established and completed for each construction season</li> <li>All worker and community complaints about sexual harassment are: a) addressed in a timely manner; and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>100% of employees and sub-contractors sign the worker Code of Conduct</li> </ul> </li> </ul>

<p>- Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</p>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

### Management Measure AWPP - 9: Gender Integration and Social Inclusion (GSI)

<p><b>POTENTIAL IMPACT</b></p>
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment for women Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p>

Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:

- Millennium Challenge Account Social and Gender Integration Plan (SGIP)
  - Encourages contractors to prioritize using local labor, particularly workers from the project affected areas and encourages contractors to employ women workers as at least 30%
- Millennium Challenge Corporation Gender Policy
  - The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.
- IFC Performance Standard 1
  - Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities
- IFC Performance Standard 2
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
- Constitution of Mongolia
  - Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.
- Mongolian Law on Gender Equality
  - Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.
- Mongolian Law on Labor
  - Prohibits discriminating against race, social origin or status, wealth, religion, or ideology
  - Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction

## OBJECTIVES

The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.

- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract at each skill/occupation level
- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impacts of the BWSE project on the project affected communities

## MANAGEMENT MEASURE

### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor and
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risk and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer

<p>-</p> <p>- <i>Community Engagement</i></p> <ul style="list-style-type: none"> <li>o The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>o Efforts to hire local labor and the Contractor's employment forecast</li> <li>o Efforts to maximize women's employment</li> <li>o Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>o Prohibitions against child labor and forced labor in supply chains</li> <li>o Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>o Zero-tolerance of gender-based violence</li> <li>o Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> </ul> <p><i>Expanding Short-Term Employment Opportunities</i></p> <ul style="list-style-type: none"> <li>• The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in: <ul style="list-style-type: none"> <li>o Modern tools and techniques where needed</li> <li>o Brigade internal labor management, accounting, and estimation techniques</li> </ul> </li> <li>• As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative, or other means approved by the Engineer.</li> <li>• Where appropriate, the Contractor will provide training to enhance the skills of local people using on-site apprenticeships and internships</li> <li>• As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduate and members</li> </ul> <p>-</p> <p>- <i>Local Procurement</i></p> <ul style="list-style-type: none"> <li>• The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.</li> <li>• The Contractor will develop and submit for review and approval by the PMC, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</li> <li>• The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul> <p>-</p>	<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities and project affected communities</p> <p><b>MONITORING</b></p> <p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Gender Integration and Social Inclusion Plan</li> </ul>
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<ul style="list-style-type: none"> <li>• Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>• Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>• Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>• Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Employment recruitment activities</li> <li>• Employment records of workers</li> <li>• Number, dates, and locations of community engagement meetings</li> <li>• Community related grievance redress actions and outcomes</li> <li>• Number of purchase orders signed each year with UB businesses disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Total annual dollar amount of procurements from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders.</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• 100% of required community meetings are held, with all topics covered</li> <li>• Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>• Achievement of 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>• Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>• Apprenticeships and internships established and completed for each construction season</li> <li>• Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia</li> <li>• Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>○ Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>○ Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>
REPORTING:
<ul style="list-style-type: none"> <li>• Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>• Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>



SCHEDULE	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
RESPONSIBILITY	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> MCA-Mongolia or its representative's Social Safeguards Team and Contractor <i>Oversight:</i> Engineer

### Management Measure AWPP -10: Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

POTENTIAL IMPACT
Adverse impacts to be avoided or minimized: <ul style="list-style-type: none"> <li>Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>Trafficking in persons within and outside the project</li> <li>Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>MCC Counter-Trafficking in Persons Policy (C-TIP Policy)               <ul style="list-style-type: none"> <li>States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>Mongolian Law on Promotion of Gender Equality               <ul style="list-style-type: none"> <li>Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>Mongolian Law to Combat Human Trafficking</li> </ul>

<ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment</b>
<p>The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.</p> <p><i>Counter-Trafficking in Persons (C-TIP)</i></p> <ul style="list-style-type: none"> <li>• The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements..             <ul style="list-style-type: none"> <li>○ The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,</li> <li>○ Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.</li> <li>○ Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.</li> <li>○ Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.</li> </ul> </li> <li>• The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.</li> <li>• The Counter-Trafficking in Persons Response Plan shall be:             <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking</li> <li>○ Compliant with the MCC Counter-Trafficking in Persons Policy</li> <li>○ Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> <li>• The Counter-Trafficking in Persons Response Plan shall specifically prohibit:             <ul style="list-style-type: none"> <li>○ Procuring minors for sex</li> <li>○ Transporting non-employee individuals in company vehicles</li> </ul> </li> <li>• The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings</li> <li>• The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP</li> </ul>

Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).

- C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
- Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual

<p>Harassment.</p> <ul style="list-style-type: none"> <li>○ Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.</li> <li>○ Training shall address <ul style="list-style-type: none"> <li>▪ Attitudes to and prevention of sexual harassment in the workplace</li> <li>▪ Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons</li> <li>▪ Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)</li> </ul> </li> <li>• Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Ttrafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases</li> </ul>

compared to the total number of Contractor-organized community meetings, disaggregated by location

- Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons
- Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints
- Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training

Success Criteria:

*Counter-trafficking in persons*

- Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction
- The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.
- Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means
- 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan

*Gender-based violence*

- Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via:
  - 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site
  - The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence
  - Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases
  - 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it

*Sexual harassment*

- The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.
- 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work
- All worker and community complaints about sexual harassment are
  - addressed confidentially
  - addressed in a timely manner and
  - resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan
- After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities

**REPORTING:**

- Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports

<ul style="list-style-type: none"> <li>Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

### Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management

<b>POTENTIAL IMPACT</b>
Risks and impacts that may be associated with workers' accommodation and workplace conditions
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Constitution of Mongolia <ul style="list-style-type: none"> <li>Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.</li> </ul> </li> <li>Mongolian Labor Code <ul style="list-style-type: none"> <li>Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.</li> </ul> </li> <li>Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.</li> </ul> </li> <li>Mongolian Law of Fire Safety <ul style="list-style-type: none"> <li>Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.</li> </ul> </li> <li>Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33 <ul style="list-style-type: none"> <li>Prohibits precluding to conclude a contract of legal entities and organizations.</li> </ul> </li> <li>IFC Performance Standards 2 and 4 <ul style="list-style-type: none"> <li>Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.</li> </ul> </li> <li>Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>IFC and EBRD (2009) guidance at Workers' Accommodation: Processes and Standards<sup>1</sup></li> </ul>



<ul style="list-style-type: none"> <li>○ Requires having a written management plan on worker camps and housing facilities.</li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>○ Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Construction Camp and Temporary Facilities Management</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment</li> <li>• Ensure compliance with IFC and EBRD (2009) guidance at <i>Workers' Accommodation: Processes and Standard</i> for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.</li> <li>• Ensure compliance with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i> for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.</li> <li>• Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i></li> <li>• Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality</li> <li>• Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work</li> <li>• Provide all accommodation sites with sufficient supplies and services</li> <li>• Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition</li> <li>• Conduct visual checks on site to ensure proper housekeeping</li> <li>• Ensure suitable first aid equipment is kept on site, at various appropriate locations</li> <li>• Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required</li> <li>• Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies</li> <li>• Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on: <ul style="list-style-type: none"> <li>○ Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>○ General waste management, housekeeping, first aid practices, and communicable diseases</li> </ul> </li> <li>• Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>○ Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>○ Assigns roles and responsibilities for construction camp and temporary facilities management</li> </ul> </li> </ul>

<b>LOCATIONS:</b>	
All areas within and immediately surrounding construction camps and other temporary facilities	
<b>MONITORING</b>	
Document: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training</li> <li>• Submission and approval of plan</li> </ul>	
<b>LOCATIONS:</b>	
All areas within and immediately surrounding construction camps and other temporary facilities	
<b>INDICATORS AND SUCCESS CRITERIA:</b>	
Indicators: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training sessions</li> <li>• Submission of plan</li> </ul> Success Criteria: <ul style="list-style-type: none"> <li>• Plan approval</li> <li>• Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<b>REPORTING:</b>	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and annually thereafter</li> <li>• Implementation of above provisions throughout construction</li> </ul>	<i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training</li> <li>• Document implementation of above provisions</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>	<b>MONITORING:</b>
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure AWPP - 12: Cultural Heritage Protection

<b>POTENTIAL IMPACT</b>
<ul style="list-style-type: none"> <li>• Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> <li>• Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> </ul>

<ul style="list-style-type: none"> <li>Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Mongolian Law on Protection of Cultural Heritage <ul style="list-style-type: none"> <li>If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protect the intangible cultural heritage.</li> </ul> </li> <li>IFC Performance Standard 8 <ul style="list-style-type: none"> <li>Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> <li>Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.</li> </ul> </li> </ul>
<p><b>OBJECTIVES</b></p> <ul style="list-style-type: none"> <li>Protect tangible cultural heritage from inadvertent excavation or damage</li> <li>Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> </ul>
<p><b>MANAGEMENT MEASURE</b></p> <p><b>Cultural Heritage Protection</b></p> <p><b>Chance Find Procedure</b></p> <p>As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.</p> <p>Should any unexpected tangible cultural heritage be discovered:</p> <ul style="list-style-type: none"> <li>Cease all work in the immediate area and do not disturb the chance find further, including: <ul style="list-style-type: none"> <li>Establishing a 30-meter buffer around the chance find</li> <li>Leaving buffer undisturbed until competent cultural heritage specialist assesses the site</li> <li>Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.</li> </ul> </li> <li>Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area</li> <li>Immediately notify the Engineer and the concerned government agencies, specifically the: <ul style="list-style-type: none"> <li>Office of the governor of the capital city</li> <li>Office of governor of the respective Khan-Uul District or Songinokhairkhan District</li> <li>Local police</li> <li>Institute of Archeology, Mongolian Academy of Sciences</li> <li>Institute of History and Ethnography, Mongolian Academy of Sciences</li> </ul> </li> <li>Provide the following information to the Engineer and government agencies: <ul style="list-style-type: none"> <li>Cultural heritage site type—description and photograph(s)</li> <li>Location—description and GPS coordinates</li> <li>Date, time, and details of find</li> <li>Nature of work that led to exposure of or locating the find</li> </ul> </li> <li>Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation</li> <li>Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage</li> <li>Restart work only upon written direction from the Engineer</li> </ul> <p><b>Cultural and Sacred Landscape and Places</b></p>

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

### **Training**

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

- Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum:
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above
  - Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities
  - Assigns roles and responsibilities for training
- Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.

#### **LOCATIONS:**

- All work sites
- Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred

### **MONITORING**

Monitor throughout construction

#### *Chance Find Procedure*

- Construction work sites during excavation or other ground disturbance

#### *Cultural and Sacred Landscape and Places*

- Communications SST Community Liaison Officers and Engineer
- Written directions of Engineer
- Actions to accommodate spiritual, religious, and traditional ceremonies and rituals
- Performance of spiritual, religious, and traditional ceremonies and rituals

#### *Training*

- Document submission and approval of training plan
- Document training of personnel as specified in approved plan

#### **LOCATIONS:**

- All work sites

#### **INDICATORS AND SUCCESS CRITERIA:**

Indicators:

#### *Chance Find Procedure*

- Chance find of tangible cultural heritage
- Excavation or damage of tangible cultural heritage
- Cease work decision
- Protection of chance find area and tangible cultural heritage

#### *Cultural and Sacred Landscape and Places*

- Performance of spiritual, religious, and traditional ceremonies and rituals

<p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Submission of training plan</li> <li>• Date and location of training sessions, or as specified in approved plan</li> <li>• Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Training plan approval</li> <li>• All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>	
<p><b>REPORTING:</b></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Report chance find and cease work decision</li> <li>• Report excavation or damage of tangible cultural heritage</li> <li>• Report actions to protect chance find area and tangible cultural heritage</li> <li>• Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Report communications with SST Community Liaison Officers and Engineer</li> <li>• Report directions of Engineer</li> <li>• Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>• Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>• Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Continuous during excavation or other ground disturbance</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• As required, periodically throughout project construction</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Personnel training in accordance with timing and frequency specified in</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>• Document communications with SST Community Liaison Officers and the Engineer, and written directions of Engineer as they occur</li> <li>• Document communications and written approval of Engineer as they occur</li> </ul>

approved plan; at minimum, once at beginning of each construction season	<ul style="list-style-type: none"> <li>Document training sessions and personnel start, training, and field deployment as they occur, or as specified in approved plan</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure AWPP - 5: Emergency Preparedness and Response
- Management Measure AWPP - 7: Waste Management
- Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management

#### Management Measure AWPP -13: Health and Safety Management

<b>POTENTIAL IMPACT</b>
Health and safety risks and impacts on work sites and in construction camps, and in the community
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Mongolian Law on Hygiene               <ul style="list-style-type: none"> <li>Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>Mongolian Law on Waste               <ul style="list-style-type: none"> <li>Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>IFC Performance Standard 4               <ul style="list-style-type: none"> <li>Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> <li>IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning               <ul style="list-style-type: none"> <li>Provides guidance on occupational health and safety and community health and safety.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Identify, assess, manage, and record and communicate all health and safety hazards, and ensure:               <ul style="list-style-type: none"> <li>Resulting risks to people, property, assets, and the environment are evaluated</li> </ul> </li> </ul>



- Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical
- Any requirements to mitigate risks are implemented
- Risks and actions to manage them are reported and communicated

## MANAGEMENT MEASURE

### Health and Safety Management

The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.

The Contractor will:

- Fully comply with the requirements of this management measure
- Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup>
- Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to:
  - Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan
  - Section 01046 Control of Work, Paragraph 3.05 Open Excavations
  - Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets
  - Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control
  - Protect drinking water sources, whether public or private, at all times
- Prepare and implement a traffic control plan for accessing the site, approved by Engineer
- Implement all reasonable precautions to protect the health and safety of workers
- Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers
- Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities
- Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident
- Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities
- Avoid or minimize traffic accidents and promote traffic safety by all project personnel
- Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials
- Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures
- Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice
- Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project

<ul style="list-style-type: none"> <li>Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply</li> <li>Specifies: <ul style="list-style-type: none"> <li>Site security, including securing of excavations, hazardous materials, etc.</li> <li>Confined space safety procedures</li> <li>Excavation and trenching safety measures</li> <li>First aid facilities, equipment, and materials</li> <li>Protective clothing and safety equipment</li> <li>HIV/AIDS awareness program</li> <li>Covid-19 awareness program</li> <li>Counter-trafficking in persons program</li> <li>Health and Safety management monitoring and reporting</li> </ul> </li> <li>Assigns roles and responsibilities for health and safety management</li> </ul>	
LOCATIONS:	
All project sites and surrounding communities	
<b>MONITORING</b>	
Document submission and approval of plan	
LOCATIONS:	
All project sites and surrounding communities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>Plan approval</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>Summarize activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## 3.6 Education, Training, and Community Outreach

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure AWPP - 5: Emergency Preparedness and Response
- Management Measure AWPP - 6: Mongolian Marmot Protection and Habitat Restoration
- Management Measure AWPP - 7: Waste Management
- Management Measure AWPP - 8: Labor Management
- Management Measure AWPP - 9: Gender Integration and Social Inclusion (GSI)
- Management Measure AWPP - 10: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure AWPP - 11: Construction Camp and Temporary Facilities Management
- Management Measure AWPP - 12: Cultural Heritage Protection
- Management Measure AWPP - 13: Health and Safety Management

Together, these management measures will be part of the Education, Training, and Community Outreach Plan.

#### **Management Measure AWPP - 14: Stakeholder Engagement, Community Consultation, and Grievance Redress**

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>○ Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>○ Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b>

The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.

### **Stakeholder Engagement**

- The Contractor will:
  - Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework
  - Maintain, revise, and update the project Stakeholder Engagement Matrix
  - Document all stakeholder engagement activities in the Stakeholder Engagement Matrix

### **Community Consultation**

- The MCA-Mongolia or its representative will:
  - Introduce Contractor's officers to communities
  - Monitor and supervise Contractor contacts with communities and other stakeholders
  - Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted
- In coordination with the MCA-Mongolia or its representative, the Contractor will:
  - Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the MCA- Mongolia Grievance Redress Mechanism, and other issues that arise during consultation
  - Document all community consultation activities in the Stakeholder Engagement Matrix

### **Grievance Redress**

- The MCA-Mongolia or its representative will supervise, and monitor participation by all parties
- The Contractor will:
  - Implement the Grievance Redress Mechanism consistent with Annex A
  - Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism
  - Document all grievance redress actions in the Stakeholder Engagement Matrix
  - Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer

#### **LOCATIONS:**

All construction sites and temporary construction facilities

#### **MONITORING**

##### **MCA-Mongolia or its representative**

- Monitor Contractor contacts with stakeholders and communities
- Monitor participation by all parties in Grievance Redress Mechanism

##### **Contractor**

- Document all stakeholder engagement activities
- Document all community consultation activities
- Record results of Contractor's community consultation activities
- Document all grievance redress activities under the Grievance Redress Mechanism

#### **LOCATIONS:**

All construction sites and temporary construction facilities

#### **INDICATORS AND SUCCESS CRITERIA:**

<b>Indicators:</b> <ul style="list-style-type: none"> <li>Number, content, and outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> <li>Grievance redress actions</li> </ul> </li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>Successful outcome of: <ul style="list-style-type: none"> <li>Stakeholder engagement activities</li> <li>Community consultation activities</li> </ul> </li> <li>Resolution of grievances</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

### 3.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

5. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
6. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## 4 Implementation Work Plan and Schedule

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.



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## Annex A – Grievance Resolution Mechanism

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The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>92</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

3. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
4. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>93</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>94</sup> References available upon request to MCA.

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<sup>92</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>93</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>94</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017

The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.
- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.

If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

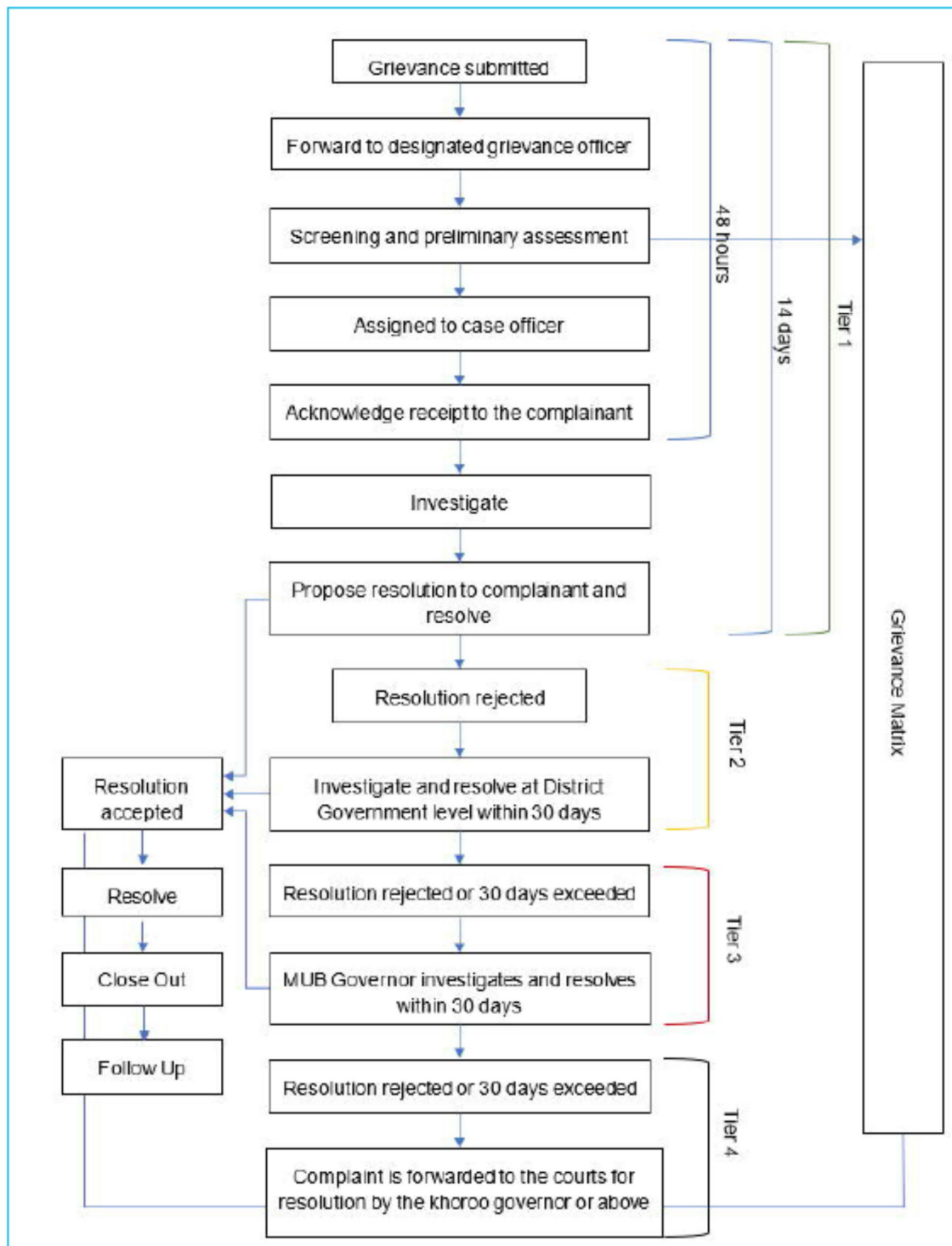
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM



## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contact and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both a MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.



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# **Annex B – Public Consultation and Stakeholder Engagement Plan for BWSE**

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## **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

## **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

10. Staffing and resources
11. Stakeholder Identification and Analysis
12. Information Disclosure
13. Stakeholder Consultation
14. Partnerships
15. Grievance Management
16. Stakeholder Involvement in Project Monitoring
17. Reporting to Stakeholders
18. Management Functions

## **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social licence to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc, filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

## **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

## **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions

6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

5. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
6. Observations by affected parties, triangulated to strengthen validation,
7. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
8. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen

support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

7. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
  8. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
  9. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
  10. Make monitoring results publicly available, especially reports of any external monitors.
  11. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
  12. Derive an SOP for reporting to stakeholders.
- 51.

## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

8. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
9. The hiring and training of community liaison officers
10. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
11. Input and suggestions received from stakeholders on project design and proposed mitigation measures
12. Grievance mechanisms that capture and respond to stakeholder concerns
13. The involvement of local stakeholders in project monitoring
14. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals

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- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field- level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes –stakeholder relations becomes a collective responsibility.

## J.3 CP-3: Raw and Finished Water Conveyance

### 1. Introduction

This environmental and social management plan (ESMP) specifies management measures to avoid, minimize, or offset potential significant adverse environmental and social impacts, or reinforce or enhance potential beneficial impacts of construction contract package CP-3: Raw and Finished Water Conveyance of the proposed Ulaanbaatar (UB) Bulk Water Supply Expansion (BWSE). Consistent with International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (Performance Standards), this ESMP adopts “a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.”<sup>95</sup>

Management measures and, as necessary, compensation are specified for the following project phases:

- Preconstruction – i.e., actions that need to occur prior to construction; however, not including land acquisition and involuntary resettlement, which are addressed in detail in the BWSE resettlement action plan (RAP), and not including construction mobilization
- Construction, including construction mobilization and demobilization
- Operation and Maintenance, which will be conducted by others and is not included in the version of this ESMP which is being issued for construction bidding

Construction mobilization is scheduled to begin within several months of issuing this ESMP and the preconstruction phase then will have been completed. As preconstruction activities currently are underway and soon will be concluding, the associated management measures specified in the ESMP are few and predominantly reference management measures otherwise specified for the construction phase.

For each management measure, as appropriate for each phase of the project, the ESMP details:

- Potential Impact – Potential adverse or beneficial effect that the measure is designed to address, and target locations, resources, or communities
- Standard / Requirement Triggered – Mongolian or international standard or requirement triggered by the potential impact
- Management Measure – Specific, implementable, verifiable, and cost-effective action to be taken
- Monitoring – Monitoring activity to be undertaken
- Locations – Locations where the management measure and monitoring are to be implemented
- Indicators and Success Criteria – Indicators and criteria to be used to verify that the management measure is being implemented, and that it is effective and sufficient
- Reporting – Monitoring reporting requirement
- Schedule – Timing and frequency of implementing the management measure, monitoring, and reporting
- Responsibility – Delineation of responsibilities for implementing the management measure, monitoring, reporting, and oversight

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<sup>95</sup> Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation. 2012. *Performance Standards on Environmental and Social Sustainability*. World Bank Group, January 1, 2012.

The management measures and monitoring specified in this ESMP will be implemented, as applicable, together with the conditions, procedures, and best engineering practices specified in the design of the BWSE project prior to or irrespective of its evaluation in the ESIA. For purposes of the ESMP, best engineering practices and management measures are distinguished as follows:

- *Best engineering practices* are actions typically taken by the project proponent, construction contractor, or operator to avoid or minimize potential adverse environmental and social impacts but are not implemented in response to the impact findings of the ESIA.
- *Management measures* specified in the ESMP differ from best engineering practices in that they will be implemented specifically in response to the impact findings described in the ESIA.

In other words, best engineering practices are inherently part of the BWSE and are not additional management measures specified as a result of the impact assessment process. With respect to the construction phase, they are practices that typically are within the scope of services of the construction contracting firm performing the work. Their implementation is assumed in the impact analysis presented in the ESIA.

The best engineering practices are detailed as Technical Specifications and are set forth in Section V, Works Requirements of the Construction Contract Documents. Those technical specifications that the ESIA team assumed would be taken by the project proponent, construction contractor, or operator, and would avoid or minimize potential adverse environmental and social impacts are organized into Division 1 – General Requirements and Division 2 – Site Work, and in turn into sections. The relevant issues are addressed by technical specifications in the respective sections indicated in the two following Technical Specification text boxes.

If the best engineering practices in place avoid or sufficiently reduce the impact of activities evaluated in the ESIA below the level at which the impact would be significant, additional avoidance or minimization of potential adverse impacts may not be needed. Conversely, management measures specified in the ESMP have been developed to avoid, minimize, or offset adverse impacts; or to reinforce or enhance beneficial impacts.

### **Technical Specifications, Division 1 – General Requirements**

#### **Section 01030, Special Requirements**

- Site-specific health and safety plan
- Site-specific emergency action plan
- Site-specific hazardous waste management plan
- Backfilling operations following pipe laying
- Application of clean water to control dust
- Removal and legal disposal of unsuitable material and excess material
- Disposal of debris
- Preconstruction Video Recording of Entire Site
- Detours and Road Accessibility
- Owner Obtained Permits

#### **Section 01046, Control of Work**

- Hours of Construction
- Safeguarding of Open Excavations
- Occupying Private Land
- Protection of Streets
- Care and Protection of Property

#### **Section 01063, Miscellaneous Requirements**

- Traffic Control
- Maintain Flows of Existing Utilities

#### **Section 01110, Environmental Protection Procedures**

- Protection of Existing Structures and Utilities
- Cleanup and Disposal of Excess Material
- Prevention of Environmental Pollution
- Erosion Control
- Protection of Streams, Wetlands and Surface Water
- Protection of Land Resources
- Protection of Air Quality
- Noise Control

#### **Section 01500, Temporary Facilities**

- Field Offices
- Visitor Center
- Internet Service
- Telephone Service
- Temporary Perimeter Fence
- Potable Water for Construction and Domestic Purposes
- Temporary Electrical
- Temporary Sanitary Conveniences
- Barricades
- Temporary Heat
- Shelter and Protection of Materials
- Site Security

#### **Section 01568, Erosion Control, Sedimentation & Containment of Construction Materials**

- Erosion Control

#### **Section 01610, Delivery, Storage and Handling**

- Storage and Handling of Hazardous Materials

#### **Section 01700, Contract Closeout**

- Final Cleaning

#### **Section 01710, Cleaning Up**

- Cleaning Up Project Site

### **Technical Specifications, Division 2 – Site Work**

#### **Section 02100, Site Preparation**

- Special Requirements
- Contractor shall repair or replace any structures that are damaged
- Disposal of waste/surplus materials
- Inform Owner if there were archeological findings during site preparation
- Clearing, Grubbing, Tree & Stump Removal
- Disposal of Waste Materials
- Sediment and Erosion Control

#### **Section 02140, Dewatering**

- Dewatering

#### **Section 02210, Earth Excavation, Backfill, Fill and Grading**

- Excavation
- Separation of Excavated Material for Reuse
- Trench Excavation
- Reuse and Disposal of Surplus Excavated Materials
- Care and Restoration of Property
- Backfilling

#### **Section 02230, Site Clearing**

- Clearing and Grubbing

#### **Section 02268, Erosion Control Barrier**

- Erosion Control Barrier

#### **Section 02480, Landscaping**

- Plants
- Loam and Seed
- Planting
- Maintenance of Seeded Areas and Planting

#### **Section 02483, Planting Operations**

- Planting and Maintenance of Trees, Shrubs and Ground Cover

#### **Section 02485, Loaming and Seeding**

- Loaming and Seeding of disturbed area
- Wetland Seed Mixture
- Straw for Erosion Control

As appropriate for each of the subject project phases or the overall ESMP, the ESMP organizes and summarizes the management measures into the following constituent plans and schedules:

- Environmental Management
- Waste Management
- Social and Gender Inclusion
- Health and Safety Management
- Education, Training, and Community Outreach
- Risk Control and Emergency Response
- Monitoring and Verification, and Maintenance Actions
- Implementation Work Plan and Schedule

The first four plans/schedules listed above detail specific management measures to mitigate adverse environmental and social impacts or reinforce potential beneficial impacts. Each management measure is detailed in a table that is specific to that measure. The remaining plans/schedules provide procedures, as appropriate referencing the management measures in the preceding plans, to address specific concerns and issues, or summarize the measure-specific procedures, timetables, and schedule for implementing the ESMP.

## 2. Pre-Construction Phase

### 2.1 Responsibilities During Pre-Construction

#### 2.1.1 MCA-Mongolia

MCA-Mongolia or its representative will be responsible for oversight of the pre-construction-related management measures and monitoring specified in the ESMP. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) and coordinate with the Contractor during the pre-construction and construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### 2.1.2 Contractor

The construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all pre-construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring of pre-construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. Following construction contract award, the Contractor will develop a site-specific Contractor's Environmental and Social Management Plan (CESMP), as further described below, for approval by the Engineer prior to start of the construction works. The Contractor will prepare the site-specific CESMP based on the contents of Section V, Works Requirements and this ESMP. The Contractor will submit the detailed, site-specific CESMP to the Engineer within 28 days after receiving the Letter of Acceptance. The CESMP must be approved by the Engineer prior to commencement of the execution of the Works.

The Contractor is advised that all sites where the Contractor will establish temporary construction facilities will be subject to environmental and social impact assessments and must be covered by



an acceptable CESMP and must be permitted in accordance with all applicable permitting requirements. The Contractor will need to negotiate with and potentially compensate landowners for temporary use of land.. These temporary facilities may be co-located and potentially would comprise the following:

- Construction camps
- Laydown, staging, and storage sites
- Concrete batch plants
- Site offices
- Fuel storage
- Parking areas

The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities. Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will develop a grievance redress mechanism (GRM) based on guidance provided in Annex A of the ESMP.

The Contractor will designate an Environmental and Social Performance Manager as a key staff. This individual will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental, social, and gender issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and relevant monitoring requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions proposed by the Contractor, as needed, to reflect field conditions with the approval of the Engineer.

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works.

Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan and Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Stakeholder Engagement Plan

- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the pre-construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit an ESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

### **2.1.3 Contractor's Environmental and Social Management Plan (CESMP)**

The site-specific CESMP is required for construction activities and will provide the implementation vehicle of specific management activities applicable for the construction sites. At the direction of the Engineer, the Contractor is required to update the CESMP, including constituent plans and procedures, during the construction works as part of its obligations under its contract. The CESMP is required to strictly follow and comply with the environmental, social, health and safety requirements of the Millennium Challenge Corporation (MCC) and national legislation, as well as this ESMP, its constituent plans, and other applicable documents and regulations.

The site-specific CESMP will provide identified site-specific management measures, and refine organizational and operational procedures for the implementation of those measures, including implementation timeline and specific reporting requirements. The CESMP will detail the plans and procedures constituent to the CESMP and elaborate complimentary environmental, social, and health and safety management measures and training, and indicate the responsibility for implementation, technical details, and how implementation will be monitored. The CESMP, at a minimum, shall include the following plans:

- Environmental Management Plan
- Waste Management Plan
- Social and Gender Inclusion Plan
- Health and Safety Management Plan
- Education, Training, and Community Outreach Plan
- Risk Control and Emergency Response Plan
- Monitoring and Verification, and Maintenance Actions Plan

#### **2.1.3.1 Objectives of the CESMP**

The Contractor will prepare the site-specific CESMP in order to properly manage its construction activities in accordance with Section V, Works Requirements and this ESMP, and in compliance with requirements of MCC and Mongolian legislation. This includes requirements on community engagement and gender integration incorporated into the ESMP, the Employer's Social and Gender Integration Plan, and Counter-Trafficking in Persons requirements of MCC, and the laws and regulations of Mongolia.

The site-specific CESMP will be prepared with the following objectives:

- Provide the environmental and social policy of the Contractor
- Provide operational and emergency procedures, developed to address the environmental aspects and risks associated with the construction activities
- Provide details on approaches and measures and appropriate personal protective equipment (PPE) and other equipment for handling hazardous waste generated on each site

- Provide details on communication and reporting, as well as contacts of site supervisors nominated to control and guide works involving disturbance of hazardous materials and waste
- Clarify the implementation and operation of the site-specific CESMP to ensure that structure and responsibilities are assigned, workers are trained, aware, and competent, and that there is proper communication, documentation, operational control, and emergency preparedness and response
- Provide organizational and technical procedures for implementation of the CESMP to ensure that construction activities associated with potential environmental and social impacts are carried out in a controlled and responsible way
- Provide checking and corrective action through monitoring and measurement
- Provide mechanisms for maintaining adequate records of corrective actions to allow effective monitoring
- Provide mechanisms for maintaining effective two-way communication between the Contractor and the community and stakeholders
- Provide full compliance with Mongolian Law on Labor, Law on Promotion of Gender Equality, and other relevant employment laws. Ensure each employee has a written contract and is made aware of and signs the Worker Code of Conduct, and ensure compliance with the Labor Management Plan
- Provide training on and awareness in accordance with the following management measures:
  - Emergency Preparedness and Response
  - Waste Management
  - Labor Management
  - Gender Integration and Social Inclusion
  - Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
  - Stakeholder Engagement, Community Consultation, and Grievance Redress
  - Construction Camp and Temporary Facilities Management
  - Cultural Heritage Protection
  - Health and Safety Management

When preparing the site-specific CESMP, it will include the following:

- Management Acknowledgements
- Organization and Staffing
- Communications and Reporting
- Environmental, Social, and Health and Safety Provisions

The Contractor will prepare and submit for the Engineer's approval the site-specific CESMP, including constituent plans and procedures, within 28 days after receiving the notice of contract award. The Engineer may require periodic reviews, including updating of the CESMP during the construction works.

### **2.1.3.2 Management Acknowledgements**

#### **9) Certification and Commitment**

The site-specific CESMP submitted by the Contractor will provide a signed statement from the Contractor's Project Director attesting to a commitment that all environmental and social protection, safety, and occupational health and safety aspects of the contract will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions

in the ESMP, its constituent plans, environmental and social requirements of the contract, as well as the approved site-specific CESMP.

#### 10) Statutory Understanding and Compliance

The site-specific CESMP will provide a statement attesting the Contractor's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in Mongolia, specifically regarding compliance with:

a) All current environmental laws and regulations, related to, but not limited to, the following:

- Noise
- Vibration
- Air pollution
- Water contamination
- Solid and hazardous waste disposal
- Waste disposal
- Sanitary conditions (water supply, sewerage, wastewater disposal, etc.)
- Use of explosives;
- Protection of public traffic
- Historical, cultural, and archaeological monuments/sites
- Resettlement, land acquisition, servitude, temporary use of land and compensation, etc.

b) All current labor laws and laws related to, but not limited to, the following:

- Contract of employment and labor disputes
- Working conditions
- Management, monitoring, and supervision
- Gender-based discrimination in employment
- Child labor
- Trafficking in persons
- Gender-based violence
- Sexual harassment

c) All occupational health and safety legislation including, without limitation, the rules and regulations of Mongolia and the authorities having jurisdiction. These provisions will be included and regulated through the Health and Safety Management Plan.

#### 11) Availability of Documents

The site-specific CESMP will state where copies of environmental and social regulations and documents will be available on the construction sites and verify that all regulations and documents have been or will be made available.

#### 12) Management of Subcontractors

The requirements of this and related sections and obligations therein will be included in implementation of parts of the construction activities by the approved subcontractors, while the Contractor will:

- a) Provide subcontractors with copies of the site-specific CESMP, the ESMP, the constituent plans, and other relevant environmental and social policies, plans, documents, and regulations, while incorporating such provisions into all subcontracts and ensuring compliance with such plans under the Contract.

- b) Require all subcontractors to appoint an environmental representative, social representative, and health and safety representative, who will be available on the sites throughout the operational period of the respective subcontract and ensure as far as is practically possible that staff and employees of subcontractor(s) are conversant with appropriate parts of the site-specific CESMP and the relevant environmental and social documents and regulations.

### **2.1.3.3 Organization and Staffing**

#### **7) Organization Chart**

The site-specific CESMP will include an organization chart identifying, by job title and by the name of the individual, the personnel to be engaged solely for environmental protection, social and gender, and health and safety control. The chart and the supporting text will identify participants and their contact details.

#### **8) Identification of Responsibilities**

The site-specific CESMP will provide descriptions of the responsibilities of the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager appearing on the organization chart. Additionally, the CESMP will provide a description of the responsibilities of the Contractor's Social Safeguards Officer or Social Safeguards Team.

##### **a) Environmental and Social Performance Manager**

The Environmental and Social Performance Manager, qualified in ESMP and resettlement implementation, throughout the construction period will be primarily responsible for daily inspection and monitoring of ESMP implementation. The Environmental and Social Manager will prepare monthly and as-needed incident reports and submit them to the Engineer. MCA-Mongolia will report to MCC and send feedback to the Contractor through the Engineer or directly when urgent action is required. Monitoring and reporting on the implementation of follow-up action will also be part of the Environmental and Social Manager's duties.

The Environmental and Social Performance Manager additionally will be responsible for environmental management of the construction sites and day-to-day management of environmental issues. The Environmental and Social Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the site-specific CESMP or relevant environmental documents and regulations.

The Environmental and Social Performance Manager will maintain a daily site diary/record-book comprehensively recording all relevant matters concerning the construction sites' environmental management, safety, and traffic control, inspections, and audits, related incidents and the like. The site diary will be available at all times for inspection by the Engineer.

##### **b) Social and Gender Manager**

The Social and Gender Manager will be responsible for day-to-day management of social issues for the duration of construction works. The Social and Gender Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices

or other infringements of the site-specific CESMP or relevant social documents and regulations. The Social and Gender Manager will be responsible for overall stakeholder engagement and consultation process, ensuring proper labor contracting and working conditions, issues related to trafficking in persons, and organizing and delivering trainings, appropriate communication, and reporting.

Additionally, the Social and Gender Manager will monitor the internal grievance mechanism. In case of sexual harassment or violence, will liaise with the MCA-Mongolia or its representative's Social Safeguards Team and engage an independent third party such as the Centre for Gender Equality to manage investigations of allegations.

With input from site supervisors, the Social and Gender Manager will maintain a diary/record-book comprehensively recording all relevant matters concerning site social issues management, inspections and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

c) Health and Safety Manager

The Health and Safety Manager will be responsible for day-to-day management of health and safety issues for the duration of construction works, including HIV/AIDS and Covid-19 related issues. The Health and Safety Manager will be empowered to instruct employees of the Contractor and subcontractor(s) to cease operations and will take the appropriate action as is necessary and within his/her limits of delegation by informing others as may be appropriate to prevent unsafe working practices or other infringements of the Health and Safety Management Plan or requirements of health and safety documents and regulations.

The Health and Safety Manager through input from site supervisors will maintain a health and safety diary/record-book comprehensively recording all relevant matters concerning site health and safety management, inspections, and monitoring, incidents and emergencies, as well as other relevant issues. The diary will be available at all times for inspection by the Engineer.

d) Social Safeguards Officer / Social Safeguards Team

The Contractor's Social Safeguards Officer or Social Safeguards Team, under the Social and Gender Manager, will be appointed to manage the contractual obligations specified in the construction contract. Depending on the size of the company, the Contractor designate at least Social Safeguards Officer; more if the number of employees exceed 50. Additionally, a Contractor Community Liaison Officer may be needed to work with local labor.

The responsibilities of the Social Safeguards Officer or Social Safeguards Team are the following:

- Coordinate with the MCA-Mongolia or its representative regarding the protocols for community contact
- Maintain records of all community contacts and integrate with the project Stakeholder Matrix
- Liaise with the MCA-Mongolia or its representative over community contacts
- Liaise with the MCA-Mongolia or its representative to implement and assist in resolution of grievances
- Inform the MCA-Mongolia or its representative of employment vacancies and recruit through the Ministry of Labor offices and process



- Monitor and promote the employment of women to achieve the recommended target of 30 percent or more
- Plan and ensure delivery of the contractually required employee awareness training and information programs
- Liaise with training organizations and experienced NGOs to find those able to design training courses on aspects of employee behavior, sexual harassment and gender based violence, gender equity, HIV/AIDS, conflicts over employment opportunities and foreign workers, cultural awareness, and chance finds processes
- Support complainants to the Contractor's internal grievance system, particularly those alleging sexual harassment or gender-based violence
- Assist the Contractor's personnel department to manage the internal employee grievance mechanism for reporting grievances
- Manage the Contractor's responsibilities with the project GRM; documenting, reporting, and taking part in finding solutions

## 9) Appointments

The Contractor will include the CV of the following proposed personnel in the bidding package and submit to MCA-Mongolia for approval the names and details (full CVs) of these proposed personnel within 14 days after the notification of contract award:

- Environmental and Social Performance Manager
- Social and Gender Manager
- Health and Safety Manager
- 

The proposed personnel will hold the attestation/proof of professional qualification required from the relevant government authorities to perform and submit pertinent studies and documentation to relevant Government agencies, with an advanced post graduate degree in a relevant discipline or as a certified consulting engineer, and relevant post-graduate experience in Mongolia.

The Contractor will obtain approval and appoint the Environmental and Social Performance Manager, Social and Gender Manager, Health and Safety Manager, and Social Safeguards Officer prior to commencement of construction works, unless otherwise, in exceptional circumstances, it is agreed in writing with the Engineer. Key personnel identified in Section IV, the Environmental and Social Performance Manager, Social and Gender Manager, and Health and Safety Manager, will not be removed from the construction works without written permission of the Engineer. Within 14 days of any such removal or notice of intent of removal, a replacement for the respective personnel will be nominated by the Contractor for approval by the Engineer and MCA-Mongolia (MCA-Mongolia will approve any key staff).

### **2.1.3.4 Communications and Reporting**

The site-specific CESMP will explain the proposed interaction and communication procedures between construction personnel and environmental, social and gender, and health and safety staff, including:

- Communication facilities
- Routine communication and reporting systems
- Stakeholder engagement and consultation activities

## 7) Environmental, Social and Gender, and Health and Safety Reports

The Contractor will submit the environmental, social and gender, and health and safety reports shown in Table 1.

**Table 1 Summary of Report Requirements**

Report	Submission Schedule	Content
<b>Site-specific CESMP</b>	One time during mobilization, within 28 days after the Letter of Acceptance	<p>The Contractor will carry out an assessment of environmental, social and gender, and health and safety conditions at the work sites to define site-specific impacts and adequate mitigation measures. The Contractor will also develop constituent plans and procedures required as a part of CESMP.</p> <p>The site-specific CESMP must be approved by the Engineer prior to commencement of construction activities.</p>
<b>Training and Orientation Report</b>	<p>One time during mobilization, before commencement of works</p> <p>Monthly updates during implementation of works</p>	<p>The Contractor will summarize information regarding training and orientation mandated under each plan, carried out before involvement of the labor in construction activities and during toolbox talks. Toolbox talks on each plan topic must be delivered monthly.</p> <p>The Contractor will provide copies of the Training and Orientation Reports to the Engineer. The Contractor will provide monthly updates of training and orientation activities during implementation of works in the Monthly Progress Reports.</p>
<b>Regular Weekly Environmental, Social and Gender, and Health and Safety Reports</b>	Weekly during implementation of works	<p>The Contractor will undertake environmental, social and gender, health and safety inspections and report weekly, and will provide copies of such reports to the Engineer each month for the duration of contract.</p> <p>The weekly environmental reports will include:</p> <ul style="list-style-type: none"> <li>• Environmental and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> </ul> <p>The social and gender reporting will include sections on issues arising in the fields of:</p> <ul style="list-style-type: none"> <li>• Recruitment strategy, employment of men and women, and prohibition of child labor</li> <li>• Implementation of the Worker Behavior Code of Conduct and outcomes</li> <li>• Gender related grievances and investigations</li> </ul>

Report	Submission Schedule	Content
		<ul style="list-style-type: none"> <li>• Training on employee behavior, gender, social inclusion, counter-trafficking in persons, gender-based violence, and sexual harassment, health education, cultural awareness, and feedback from employees</li> </ul>
<b>Monthly Progress Reports</b>	Monthly during implementation of works	<p>Summaries of these reports (including information on environmental and social activities undertaken, permits and agreements obtained, etc.) will be included in the monthly progress reports to be submitted to Engineer for review and approval. It is expected that monthly progress reports will include information on:</p> <ul style="list-style-type: none"> <li>• Employment records of workers (used to track participation in training and progress toward women's employment targets and local labor targets)</li> <li>• Training and orientation activities</li> <li>• Environmental, social and gender, and health and safety management actions / measures taken, including approvals sought from local or national authorities</li> <li>• Observations and concerns raised and/or decisions taken with regard to environmental, social and gender, and health and safety management during site meetings</li> <li>• Problems encountered in relation to environmental, social and gender, and health and safety aspects (including delays, incidents, damages and cost consequences, emergencies, etc.)</li> <li>• Investigations into the contractor internal grievance redress mechanism with outcomes</li> <li>• Lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, and health and safety requirements on the part of the Contractor and/or subcontractor(s)</li> <li>• Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements</li> <li>• Chance historical, cultural, and archaeological finds</li> <li>• Follow-up on incident investigation</li> <li>• Follow-up on the status of measures and/or corrective actions identified (including remedial measures) and their efficacy, to eliminate and minimize lack of compliance with contract requirements</li> <li>• Stakeholder engagement and consultation activities carried out during reporting period, grievances registered and resolved</li> <li>• Grievances registered and resolved.</li> </ul>

## 8) Notification of Incidents and Changes

The site-specific CESMP will verify that provisions have been made to ensure that the Contractor notifies relevant parties in accordance with Section VIII Particular Conditions of Contract, Sub-Clause 4.8 after the following incidents and changes:

- Occurrence of any incident that has resulted, or could reasonably be foreseen to result, in lack of compliance with this ESMP and the technical specifications in relation to environmental, social and gender, especially internal complaints related to sexual harassment, gender-based violence and trafficking in persons for sex, and health and safety requirements
- Changes of assumptions, conditions, measures, designs, and actual works in relation to environmental, social and gender, and health and safety requirements
- Chance historical, cultural, and archaeological finds

In addition to the initial written notification, the Contractor will submit a preliminary report on incident investigation within 7 days after the incident, as well as final report on incident investigation within 14 days after the incident. All incidents should be investigated by the competent professional (relevant independent professionals can also be involved, as needed). The final report on the incident investigation will include information on the investigation's objectives, methodology applied, analysis and tests carried out, findings, conclusions, and recommendations.

Allegations against staff of sexual harassment or gender-based violence, or involvement in trafficking in persons inside the Contractor's organization require reporting to the MCA-Mongolia or its representative's Social Safeguards Team. The Contractor's Social and Gender Manager will liaise with the MCA or its representative and other relevant parties, and arrange for a third party investigator to lead the enquiry into allegations together with the Contractor's human resources representative. Proven harassment or violence offences in contravention of the Worker Behavior Code of Conduct must result in the immediate firing of the perpetrator and reporting through the project system.

Allegations of trafficking in persons must be dealt with according to the Section VIII Particular Conditions of Contract Sub-Clause 6.16, "Combatting Trafficking in Persons", which summarizes the Contractor's reporting requirements and specifies remedies that the MCA Entity will apply to confirmed cases.

Section VIII Particular Conditions of Contract Sub-Clause 6.17, "Prohibition of Sexual Harassment", specifies that "The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction."

## 9) Communication with Subcontractor(s)

The site-specific CESMP will specify:

- How environmental, social and gender, and health and safety requirements will be communicated to subcontractor(s) at all levels and how their compliance with the CESMP and all relevant regulations will be ensured.
- Subcontractor(s) will be supplied with copies of the CESMP and other environmental and social documents developed for the project (which will be deemed part of the subcontract), and will attend and report on all relevant training and orientation sessions prior to commencement of their work and will continue covering the same topics in toolbox talks.

- The procedures for reviewing and monitoring compliance with the site-specific CESMP and environmental and social regulations. This could include, for example, the monitoring of performance against environmental and safety criteria as a part the daily and/or weekly site inspections.

### 2.1.3.5 Environmental, Social and Gender, and Health and Safety Provisions

The site-specific CESMP, including constituent plans and procedures, will include at a minimum acknowledgement of the requirements to meet the CESMP standards, the methodology and resources to meet the requirements of the management measures prescribed in the following sections of this ESMP, as well as the environmental, social and gender, and health and safety provisions of Section V, Works Requirements.

In accordance with MCC Environmental Guidelines and IFC Performance Standards, the Contractor is obliged to implement all reasonable measures with regard to soil erosion, water and air quality, noise and vibration, solid waste, hazardous materials, wastewater discharges, health and safety hazards, labor and working conditions. In a similar way, the Contractor is obliged to implement risk management strategies to protect the beneficiary communities from 1) physical, chemical, or other hazards associated with sites under construction, 2) hazards associated with increased traffic and rerouting of vehicles, and 3) communicable and vector-borne diseases associated with the population of workers.

Parallel plans and policies will be developed by the Contractor as a part of CESMP to implement mitigation measures specific for each construction site and ensure compliance with environmental, and social and gender, and health and safety requirements.

## 2.2 Environmental Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.3 Waste Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.4 Social and Gender Inclusion

### Management Measure Conveyance - 1: Labor Management

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Professional management and conditions of labor</li> <li>• Opportunities for local labor and supply of goods and services, and provision of local jobs with fair and competitive wages</li> <li>• Women's short-term employment in construction and engineering-related work</li> <li>• Potential alleviation of poverty in local area</li> <li>• Reduction in child labor</li> <li>• Improved grievance management in employment</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> </ul>



<ul style="list-style-type: none"> <li>• Sexual harassment</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>- Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>• Mongolian Law on Minimum Wage <ul style="list-style-type: none"> <li>- Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>• Mongolian Law on the Protection of the Rights of the Child <ul style="list-style-type: none"> <li>- Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>• Mongolian Law on Social Protection of Disabled Persons <ul style="list-style-type: none"> <li>- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>- Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.</li> </ul> </li> <li>• Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad <ul style="list-style-type: none"> <li>- Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.</li> <li>- Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> <li>- Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.</li> <li>- Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.</li> <li>- Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to</li> </ul> </li> </ul>

<p>any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.</p> <ul style="list-style-type: none"> <li>- Prohibits employment of child labor.</li> </ul> <ul style="list-style-type: none"> <li>• Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>- Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent exploitation of trafficking in persons and related activities workers by employers and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP.</li> </ul> </li> <li>• Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>- Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees</li> <li>- Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project</li> <li>- Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level</li> <li>- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>• Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment <ul style="list-style-type: none"> <li>- Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.</li> </ul> </li> <li>• Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy <ul style="list-style-type: none"> <li>- Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”</li> </ul> </li> <li>• Ministry of Labor and Social Welfare Order (2016) <ul style="list-style-type: none"> <li>- Expanded the types of hazardous work prohibited for children under the age of 18 to include construction</li> </ul> </li> <li>• International Labor Organization fundamental conventions, and International Human Rights instruments and conventions</li> </ul>	<div style="background-color: #e0f0ff; padding: 5px;"><b>OBJECTIVES</b></div> <p>The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.</p> <ul style="list-style-type: none"> <li>• Promote fair treatment, non-discrimination, and equal opportunity of workers</li> <li>• Promote local labor opportunities and procurement from local suppliers</li> <li>• Target women’s employment as 30% of all labor at each skill/occupational level</li> <li>• Establish and maintain and improve a constructive worker-management relationship</li> <li>• Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain</li> <li>• Avoid the use of forced labor or trafficked labor</li> <li>• Maximize the beneficial impact of the project on the affected communities</li> </ul> <div style="background-color: #e0f0ff; padding: 5px;"><b>MANAGEMENT MEASURE</b></div> <div style="background-color: #e0f0ff; padding: 5px;"><b>Labor Management</b></div> <p>The MCA-Mongolia or its representative’s Social Safeguards Team (SST) will:</p> <ul style="list-style-type: none"> <li>• Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs</li> </ul>
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- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the Contractor's publication of vacancies and procurements within affected communities
- Facilitate the Contractor's holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local businesses and entrepreneurs to bid
- Support local job applicants to apply, and local businesses and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor, and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships
- Encourage Contractor to employ socially excluded and vulnerable people

The Contractor will:

- Fully comply with the requirements of this management measure and related contract clauses
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting. Ensure the exchange of information between Contractor and the local population on employment opportunities
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and, youth, and disadvantaged groups, 2) target achieving women's employment as at least 30% of personnel at each skill/occupational level, and 3) provide training for local construction brigades on how to be effective contractors for local construction brigades
- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), implement and publicize a job fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to consider ways in which to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions and equal pay for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to help ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's

Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university

The Contractor shall note contract clauses on “Gender,” “Engagement of Staff and Labor,” “Foreign Personnel,” “Prohibition of Forced or Compulsory Labor,” “Prohibition of Harmful Child Labor,” “Employment Records of Workers,” and “Non-Discrimination and Equal Opportunity.”

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and holding procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor’s Anti-Sexual Harassment Policy and notification of the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security
  - The responsibility of all workers, regardless of their role or duration of employment, will be expected to review and acknowledge the Workers’ Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a workers’ grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial for sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor’s Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor’s Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor’s zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor’s Social Safeguards Officer contact the MCA-Mongolia or its representative’s SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation

- The Contractor shall note the contract clause on “Prohibition of Sexual Harassment”
- The Contractor shall note the contract clause on “Facilities for Staff and Labor” and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities.

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, apprenticeships, secondment to training programs such as Technical and Vocational Education and Training, etc.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor’s responsibility to “adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds” per the contract clause on “Engagement of Staff and Labor,” the Contractor’s employment forecast and recruitment strategy, and the Contractor’s Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor’s Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor’s Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor’s TIP Response Plan
  - Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative’s SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative’s SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues. These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative’s Social Manager

### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer’s written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor’s comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor’s Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers’ Code of Conduct
- Is consistent and compliant with:

<ul style="list-style-type: none"> <li>○ Mongolian Law on Labor</li> <li>○ Relevant aspects of the Conditions of Contract, as well MCC Gender Policy and the MCA-Mongolia Social and Gender Integration Plan</li> <li>○ The MCC Policy on Counter-Trafficking in Persons</li> <li>● Assigns roles and responsibilities for labor management</li> </ul>
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities</p>
<p><b>MONITORING</b></p>
<p>MCA-Mongolia or its representative:</p> <ul style="list-style-type: none"> <li>● Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor</li> <li>● Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged and other excluded groups</li> <li>● Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>● Record results of Contractor's labor management responsibilities, with all data and statistics gender disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)</li> <li>● Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities</li> <li>● Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p>LOCATIONS:</p> <p>All construction sites and temporary construction facilities</p>
<p>INDICATORS AND SUCCESS CRITERIA:</p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>● Required plans written, approved, and implemented</li> <li>● Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, and age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>● Use of written contracts with defined pay scales by employment activity</li> <li>● Employment recruitment activities, interactions with local employment offices and communities, professional associations, TVET centers</li> <li>● Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>● Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>● Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>● Numbers of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> <li>● Number of apprenticeship and internships established and completed</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>● Successful outcome of: <ul style="list-style-type: none"> <li>○ 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor on site or with any contract activity</li> </ul> </li> </ul>



<ul style="list-style-type: none"> <li>○ Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> <li>○ Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Achievement of the non-binding 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Apprenticeships and internships Internments established and completed for each construction season</li> <li>○ All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>• 100% of employees and sub-contractors sign the worker code of conduct</li> <li>• Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>• Implementation of above provisions throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training as it occurs</li> <li>• Document implementation of above provisions as it occurs</li> <li>• Maintain employee records as required above</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## Management Measure Conveyance -2: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>• Increased short-term employment and improved conditions of employment for women</li> <li>• Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Discrimination against women</li> <li>• Increased foreign labor, reducing local employment opportunities</li> <li>• Use of child labor</li> <li>• Use of forced labor</li> <li>• Use of trafficked labor</li> <li>• Exploitation of workers and Labor Code violations</li> <li>• Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Millennium Challenge Account Social and Gender Integration Plan (SGIP) <ul style="list-style-type: none"> <li>- Encourages contractors to prioritize using local labor, particularly workers from the project affected area</li> <li>- Encourages contractors to employ women as at least 30% of workers</li> <li>- Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.</li> </ul> </li> <li>• Millennium Challenge Corporation Gender Policy <ul style="list-style-type: none"> <li>- The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>• IFC Performance Standard 2 <ul style="list-style-type: none"> <li>- Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>- Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>- Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>- Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>- Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
OBJECTIVES
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract, at each skill/occupation level</li> </ul>

- To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities
- Maximize the perceived beneficial impacts of the BWSE project on the project affected communities

## MANAGEMENT MEASURE

### Gender Integration and Social Inclusion

- Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and District and khoroo Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.
- The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be:
  - Consistent with the Mongolian Law on Labor
  - Consistent with the MCC Gender Policy's emphasis on community consultation and participation
  - Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- *Community engagement*
- The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following:
  - Efforts to hire local labor and the Contractor's employment forecast
  - Efforts to maximize women's employment
  - Efforts to maximize local procurement and the Contractor's procurement forecast
  - Prohibitions against child labor and forced labor in supply chains
  - Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan
  - Zero-tolerance of gender-based violence
  - Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan
- *Expanding Short-term Employment Opportunities*
- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of employees and local people using on-site apprenticeships and internships. As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with secondment to training programs such as Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduates and members, etc..

### Local Procurement

<ul style="list-style-type: none"> <li>The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.</li> <li>The Contractor will develop and submit for review and approval by the Engineer, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.</li> <li>The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
<b>MONITORING</b>
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>Monitor Contractor Gender Integration and Social Inclusion Plan</li> <li>Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups</li> <li>Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms</li> <li>Document Contractor performance in Gender Integration and Social Inclusion Plan</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>Record results of Contractor's Gender Integration and Social Inclusion responsibilities</li> <li>Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>Employment recruitment activities</li> <li>Employment records of workers</li> <li>Number, dates, and locations of community engagement meetings</li> <li>Community related grievance redress actions and outcomes</li> <li>Number of purchase orders signed each year with UB businesses, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>Total annual dollar amount of procurements with businesses from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and percent of the total dollar amount of annual procurements</li> <li>Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>100% of required community meetings are held, with all topics covered</li> <li>Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>Achievement of the non-binding 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul>

<ul style="list-style-type: none"> <li>• Apprenticeships and internships established and completed for each construction season</li> <li>• Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>• All worker and community complaints about sexual harassment are a) addressed in a timely manner and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>• Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>○ Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>○ Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>• Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> Engineer	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> Engineer

### Management Measure Conveyance -3: Counter Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

<b>POTENTIAL IMPACT</b>
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to</li> </ul> </li> </ul>

	<p>perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.”</p> <ul style="list-style-type: none"> <li>○ Adopts “a zero-tolerance policy to TIP and prohibits “The Contractor, the Contractor’s Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract...”</li> <li>○ Requires each Contractor to “acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract” and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> <ul style="list-style-type: none"> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization’s internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims’ rights.</li> </ul> </li> </ul>
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#### OBJECTIVES

- To prevent incidence of trafficking of persons for sex by project employees
- To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites
- To prevent sexual harassment at all construction sites and temporary construction facilities
- To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace
- To prevent incidences of gender-based violence involving workers

#### MANAGEMENT MEASURE

##### Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such behavior. This information shall be provided in workers’ induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

##### *Counter-Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer’s written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements.
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers’ passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.



- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

#### *Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to

MCA-Mongolia, separately from the Grievance Redress Mechanism.

- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contactor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### MONITORING

MCA-Mongolia or its representative's SST:

- Monitor Contractor Counter-Trafficking in Persons Response Plan
- Monitor Contractor performance related to gender-based violence requirements
- Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan
- Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses

Contractor:

- Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms
- Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated

<ul style="list-style-type: none"> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities and project affected communities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via: <ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> <li>○ The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence</li> <li>○ Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>○ 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it</li> </ul>	
<p><b>Sexual harassment</b></p> <ul style="list-style-type: none"> <li>• The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work</li> <li>• All worker and community complaints about sexual harassment are <ul style="list-style-type: none"> <li>○ addressed confidentially</li> <li>○ addressed in a timely manner and</li> <li>○ resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan</li> </ul> </li> <li>• After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team</p>

## 2.5 Health and Safety Management

Based on ESIA impact determinations of low or negligible impact significance, no management measure is required for this project phase.

## 2.6 Education, Training, Community Outreach and Grievance Redress

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All

required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures also specify training requirements:

- Management Measure Conveyance - 1: Labor Management
- Management Measure Conveyance - 2: Gender Integration and Social Inclusion (GSI)
- Management Measure Conveyance - 3: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

#### **Management Measure Conveyance -4: Stakeholder Engagement, Community Consultation, and Grievance Redress**

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>- Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>- Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b></p> <p>The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure.</p> <p><b>Stakeholder Engagement</b></p> <ul style="list-style-type: none"> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Stakeholder Engagement Plan, based on requirement described in Annex B of the ESMP</li> <li>• At a minimum, the Contractor's Stakeholder Engagement Plan will document and specify: <ul style="list-style-type: none"> <li>➤ Contractor's responsibilities and participation in community consultation, specifying:</li> <li>➤ A standard operating procedure agreed with MCA-Mongolia that governs how the Contractor will interact with local communities</li> <li>➤ How contacts with the communities are to be made and recorded, and reported to the SST for documenting in the Stakeholder Engagement Matrix</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>➤ How information is to be shared with the communities and other project partners</li> <li>➤ Protocols for conducting, recording, and disseminating the results of community consultation</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a project specific Grievance Redress Mechanism (GRM) based on requirement described in Annex A of the ESMP</li> </ul> <p><b>Community Consultation</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will: <ul style="list-style-type: none"> <li>○ Introduce Contractor's officers to communities</li> <li>○ Monitor and supervise Contractor contacts with communities and other stakeholders</li> <li>○ Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted</li> </ul> </li> <li>• In coordination with MCA-Mongolia or its representative, the Contractor will: <ul style="list-style-type: none"> <li>○ Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the Grievance Redress Mechanism, and other issues that arise during consultation</li> <li>○ Actively promote awareness and disclose information in affected communities on the following: <ul style="list-style-type: none"> <li>▪ Purpose, nature, and scale of the project</li> <li>▪ Duration of proposed project activities</li> </ul> </li> <li>○ Record results of Contractor's community consultation activities</li> <li>○ Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul> </li> </ul> <p>-</p> <p><b>Grievance Redress</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will: <ul style="list-style-type: none"> <li>○ Supervise, and monitor participation by all parties</li> </ul> </li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>○ Develop and implement the Grievance Redress Mechanism consistent with Annex A</li> <li>○ Designate the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the project Grievance Redress Mechanism</li> <li>○ Document all grievance redress actions</li> <li>○ Report on the Grievance Redress Mechanism to the Engineer</li> </ul> </li> </ul> <p>-</p>
<p><b>LOCATIONS:</b></p>
<p>All construction sites and temporary construction facilities and project affected areas</p>
<p><b>MONITORING</b></p>
<p><b>MCA-Mongolia or its representative</b></p> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul> <p><b>Contractor</b></p> <ul style="list-style-type: none"> <li>• Document all Contractor's stakeholder engagement and consultation activities</li> <li>• Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>
<p><b>LOCATIONS:</b></p>
<p>All construction sites and temporary construction facilities and project affected areas</p>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Number, content, and outcome of: <ul style="list-style-type: none"> <li>- Stakeholder engagement activities</li> <li>- Community consultation activities</li> <li>- Grievance redress actions</li> </ul> </li> </ul>



<b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>- Stakeholder engagement activities</li> <li>- Community consultation activities</li> <li>• Resolution of grievances</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## 2.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

## 2.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

7. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
8. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will

be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements. As needed, this process of systematically evaluating the performance of the management measures and modifying the management measures to achieve the required outcomes, as well as the respective responsibilities of MCA-Mongolia or its representative and the Contractor, will extend into the construction phase.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## 3 Construction Phase

### 3.1 Responsibilities During Construction

#### 3.1.1 MCA-Mongolia

MCA-Mongolia or its representative and the Engineer will be responsible for oversight of the construction-related management measures and monitoring specified in the ESMP. Oversight will be accomplished by MCA-Mongolia or its representative via a combination of regular visits to the construction sites and on-site supervision of management and monitoring activities. MCA-Mongolia or its representative will inform and coordinate with all applicable stakeholders regarding their corresponding mandates under or in relation to the ESMP. MCA-Mongolia or its representative will establish a Social Safeguards Team (SST) to coordinate with the Contractor during the construction phases in implementing, supervising, reporting, and follow-up actions with regard to the ESMP.

#### 3.1.2 Contractor

Unless otherwise specified for individual management measures, the construction contracting firm performing the work, the **Contractor**, will be fully responsible for implementing and monitoring all construction-related management measures specified in the ESMP—together with the conditions and procedures specified in Section V, Works Requirements of the Construction Contract Documents. The Contractor will read the ESMP, consider it in its entirety, and comply with all aspects of the ESMP that pertain to implementing and monitoring construction-related environmental and social management.

The Contractor will abide by the requirements of this ESMP, which is appended to and is a part of the Contract. The Contractor will take all necessary measures and precautions to ensure that the execution of the works and all associated operations on site or off site are carried out in conformity with statutory and regulatory environmental and social requirements of the Government of Mongolia, the MCC Environmental Guidelines, the IFC Performance Standards, and the technical specifications, where the more stringent will apply. The Contractor will take all measures and precautions to avoid any nuisance or disturbance arising from the execution of project activities.

Wherever possible, this will be achieved by avoidance of the impact at the source rather than mitigating an impact after it has been expressed.

The Contractor will designate an Environmental and Social Performance Manager. This individual(s) will have knowledge of relevant Mongolian, IFC, and Millennium Challenge Corporation standards and regulations, and knowledge of environmental and social issues that include, but are not limited to, environmental management, waste management, gender and social inclusion, cultural resources, and health and safety management.

This individual(s) will be responsible to:

- Work closely with MCA-Mongolia or its representative to guide the Contractor's thorough understanding of the mitigation and monitoring requirements
- Lead the Contractor's work related to implementing environmental and social management measures and associated reporting requirements
- Work closely with MCA-Mongolia or its representative to incorporate or modify management measures and monitoring actions to reflect on-site field conditions, as needed, with the approval of the Engineer

The Contractor, while in possession of the construction sites, will be responsible for the safety measures undertaken in accordance with the Technical Specifications to protect the workforce of the Contractor's own staff as well as the Engineer's and MCA-Mongolia or its representative's supervision staff. The Contractor will conduct in this respect safety induction courses for all personnel involved with the works and who are required to supervise any activity prior to their attending any part of the works. Additional training is required to meet MCC social policy requirements as per the:

- Labor Management Plan
- Gender Integration and Social Inclusion Plan
- Counter-Trafficking in Persons Response Plan
- Stakeholder Engagement Plan
- Construction Camp and Temporary Facilities Management Plan
- Cultural Heritage Training Plan
- Managing external grievances as part of the project GRM

The Contractor will act responsibly to provide notification of the Contractor's schedule to enable MCA-Mongolia or its representative to carry out its responsibilities. The Contractor will be required to provide verbal and written updates to MCA-Mongolia or its representative on a regular basis indicating percent achievement of the construction-related management measures specified in the ESMP. On a monthly basis, as part of the Contractor's monthly progress report, the Contractor will submit a CESMP update that will report the status of all environmental and social compliance activities and actions taken by the Contractor.

## 3.2 Environmental Management

### Management Measure Conveyance -5: Emergency Preparedness and Response

POTENTIAL IMPACT
Accidents, natural disaster, or sabotage that occur during construction and risk jeopardizing worker and public health and safety, and the environment
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Environmental Protection</li> </ul>

<ul style="list-style-type: none"> <li>- Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> <li>• Mongolian Law on Disaster Protection <ul style="list-style-type: none"> <li>- Requires establishing management for disaster protection service, staff and specialized unit and to organize their training and preparedness.</li> </ul> </li> <li>• Mongolian Law on Fire Safety <ul style="list-style-type: none"> <li>- Requires ensuring the readiness of fire protection equipment and training their employees.</li> </ul> </li> <li>• Mongolian Law on Environmental Impact Assessment <ul style="list-style-type: none"> <li>- Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>- Requires employees attending short term training on labor safety and hygiene in compliance with procedures approved by the state central administrative organization in charge of labor issues and acquire knowledge and training.</li> </ul> </li> <li>• Mongolian Criminal Code <ul style="list-style-type: none"> <li>- Requires providing an emergency aid to the injured, to report to the relevant authority or official after having caused.</li> </ul> </li> <li>• IFC Performance Standards 1, 3, and 4 <ul style="list-style-type: none"> <li>- Requires that emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>- Provides guidance on cleanup of spill and releases of oil, fuel, lubricants, hydraulic fluids.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Avoid, minimize, and effectively respond to emergency situations and resulting adverse impacts to the environment and communities associated with accidents, natural disasters, or sabotage</li> <li>• Effectively and efficiently respond to hazardous material spills so as to minimize their human health, safety, and environmental impacts</li> </ul>
<b>MANAGEMENT MEASURE</b>
<p><b>Emergency Preparedness and Response</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Provide emergency preparedness and response training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor’s site-specific Emergency Preparedness and Response Plan, to all employees and subcontractors at the time of their induction and annually thereafter</li> <li>• Prepare and submit for the Engineer’s written approval a site-specific Emergency Preparedness and Response Plan that specifies preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment. The requirements of the Plan are detailed below.</li> </ul> <p><b>Hazardous Materials Management</b></p> <ul style="list-style-type: none"> <li>• Obtain from the appropriate Mongolian authorities all permits for the use and handling of hazardous materials</li> <li>• Develop prioritized material-specific handling procedures and training requirements as necessary according to risk</li> <li>• Assign an officer to manage and advise on hazardous materials management</li> </ul> <p><i>Handling</i></p> <ul style="list-style-type: none"> <li>• Nominate all equipment used to transfer hazardous materials for approval by the Engineer to assess that control measures are sufficient</li> </ul>

- Provide spill kits, protective equipment, and other necessary equipment wherever hazardous materials are stored or used in significant quantities
- Provide and require use of personal protective equipment (PPE) and fire protection equipment at all times when handling hazardous materials, as specified in the relevant material safety data sheets (MSDS)
- Avoid handling and do not store hazardous materials in close proximity to drainage systems, waterways, or wells

#### *Transport*

- Nominate all haulers used to transport hazardous materials for approval by the Engineer to assess that they are appropriately qualified to transport and handle hazardous materials
- Nominate all containers used to transport hazardous materials for approval by the Engineer to assess that control measures are sufficient
- Provide and require use of fire extinguishers, fire prevention materials, and spill prevention materials appropriate for the hazardous materials being transported
- Properly secure containers containing hazardous materials prior to transport
- Properly mark, label, and placard containers and trucks in accordance with the MSDS
- Maintain chemical manifests in accordance with Mongolian regulations

#### *Equipment Use and Maintenance*

- Maintain oil-filled electrical appliances in good and fire-resistant condition
- Undertake all planned equipment, plant, and vehicle maintenance in designated service areas with suitable containment to prevent contamination of the environment
- Place drip trays under all stationary equipment that use fuel, oil, or lubricants that are not self-contained (including, but not limited to, generators, mobile lighting towers, pumps)
- Equip tanks and machinery with measurement devices and overflow protection (e.g., flow and level meters, relief valves, overflow protection valves, and emergency shutoff)

#### **Spill Response Procedure**

- Contractor employees are responsible for verbally reporting all spills to their immediate supervisor.
- Supervisors will then coordinate the spill response process and report the spill as an environmental incident to the Engineer.

#### *Spill Response Kits*

- Supervisors will clearly label and store spill response kits in locations that will facilitate a prompt response to spills
- Spill response kits in all work areas will contain the following equipment:
  - Shovel
  - 2 x respiratory masks
  - Absorbent material (pads and socks)
  - 2 x goggles
  - 60-liter sealable container
  - 2 x PVC gloves
  - Jug granular absorbent
  - Red wheelie bin
- Spill response kits will be carried in mobile machinery where a significant spill risk is identified with its operation. The contents of these spill kits will be specific to the risks presented from the mobile machinery and will be adequate and appropriate for the materials being transported.
- Where there are significant spill risks apparent outside of workshops or designated hazardous material storage areas, spill response equipment will be specific to the risks posed.

#### *Control of Hazardous Material Spills*

- The health and safety of employees, subcontractors, and bystanders will be considered prior to initiating the spill response process.
- Personnel considered at risk of harm in the event of a spill will be evacuated from the spill impact area by the supervisor in charge of the work area.

- If the spill presents an emergency risk to bystanders or the environment, the site emergency response team will be notified immediately of this situation by the individual who identifies the risk.
- If safe to do so, trained individuals will attempt to control the spill at the source and remove all sources of heat and ignition.
- Spills will then be reported verbally to the immediate supervisor, who will arrange for spill containment and cleanup to occur.
- The supervisor will notify the Engineer of the spill details to enable advice to be provided and statutory reporting processes to be initiated.

#### *Containment and Clean Up of Hydrocarbons*

- Contain the extent of the spill by using absorbent material around the perimeter of the spill or earthen bunds if outside of designated workshops or storage areas.
- Excess hydrocarbons may be soaked up using absorbent materials, including dirt, or removed by use of a vacuum truck if the spill is present as free product or is on water.
- Prevent hydrocarbons entering drainage systems and waterways. If hydrocarbons do enter drainage systems or waterways, these should be dammed or have booms placed in them to minimize the spread of hydrocarbons.
- Waste material will be disposed of appropriately:
  - Absorbent material, booms, etc. will be placed into designated bins.
  - Contaminated soil and water will be removed and stored in a designated area as advised by the Engineer.

#### *Containment and Clean Up of Sewage*

- Contain the spill with sand or earth to prevent it entering drainage systems and waterways.
- Calcium hypochlorite powder will be spread around the site for spills likely to be encountered by personnel.
- Any wastewater that enters waterways or drainage systems will be disinfected with the use of calcium hypochlorite powder.
- Wastewater then will be removed by use of a vacuum truck and taken to a waste treatment facility.
- Remaining water and solids will be disinfected using calcium hypochlorite powder.

#### *Containment and Clean Up of Chemicals*

- Contain the extent of the spill using sand, earth, sawdust, or other inert material to prevent it entering drainage systems and waterways.
- Chemicals clean up may vary depending on the chemical type.
- General purpose spill kit supplies, instead of oil-absorbent supplies, will be used.
- Collect recoverable product, if possible, and dispose of at an approved disposal site or facility in accordance with guidance provided by the Engineer.

#### *Containment and Clean Up of Battery Acid*

- Contain the spill and neutralize with a basic substance such as sodium bicarbonate in accordance with guidance provided by the Engineer.
- Collect recoverable product and neutralize with sodium bicarbonate in accordance with guidance provided by the Engineer.
- Dispose of with process water on site.

#### *Follow-up Sampling, Storage, and Treatment*

- For spills rated as significant risk on incident reporting, quality of cleanup work will be determined by follow-up sampling of contamination-receiving environment and compared against the Mongolian environmental standards on permissible levels of pollutants in air, water, and soil.
- If any exceedance of pollutant permissible levels is noted, cleanup work will be considered as inadequate and further cleanup will be required.
- Follow-up sampling will be carried for all spills to evaluate reporting requirements to the Engineer.
- Hydrocarbon contaminated soils will be excavated and placed within a dedicated area for storage and treatment.



## Emergency Preparedness and Response Plan

- Prepare and submit for the Engineer's written approval a site-specific Emergency Preparedness and Response Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Complies with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements, Paragraph 1.04.D Emergency Action Plan
  - Specifies:
    - Site-specific preventive measures and response strategies the Contractor will implement in case of accidents, natural disasters, or sabotage to protect worker and public health and safety, and the environment
    - Potential emergencies and key areas prone to emergency situations
    - Existing emergency response structures and capacities in the respective project areas—i.e., police, fire brigades, paramedics / ambulances, hospitals, etc.
    - Actions to be taken prior to an emergency—i.e., preventive and preparatory measures
    - Actions to be taken during an emergency—i.e., response measures
    - Actions to be taken after an emergency—i.e., recovery and assessment measures
    - Contact lists for emergency situations
    - Description of collaboration mechanisms of the project's emergency preparedness and response teams with existing emergency response structures in the respective project areas
  - Assigns roles and responsibilities for emergency preparedness and response
- Post copies of the Plan and the list of emergency contact numbers in highly visible locations within the construction sites and temporary facilities
- In case of any accidents, the Contractor will immediately undertake the procedures contained within the Plan that complies with From IFB sub clause 4.8 safety procedures: "The Contractor shall notify the Engineer, the Employer, and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which has or which could reasonably be foreseen to have a material impact on the environment and shall submit to the Engineer, the Employer, and MCC no later than 7 days after the occurrence of such an event, a summary report thereof

### LOCATIONS:

All construction sites and temporary construction facilities

### MONITORING

Document submission and approval of plan

### LOCATIONS:

All construction sites and temporary construction facilities

### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Submission of plan

Success Criteria:

- Plan approval

### REPORTING:

- Report communications and written approval of Engineer of site-specific Emergency Preparedness and Response Plan
- Summarize activities undertaken during reporting period
- Specify any material deviations or non-compliances to this management measure, and any other issues of concern
- Define activities planned during next reporting period

### SCHEDULE

MANAGEMENT MEASURE:

MONITORING:

<b>Implementation:</b> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<b>Implementation:</b> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <b>Reporting:</b> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <b>Implementation:</b> Contractor <b>Oversight:</b> MCA-Mongolia or its representative	<b>MONITORING:</b> <b>Implementation:</b> Contractor <b>Reporting:</b> Contractor <b>Oversight:</b> MCA-Mongolia or its representative

### Management Measure Conveyance -6: Tree Relocation and Revegetation

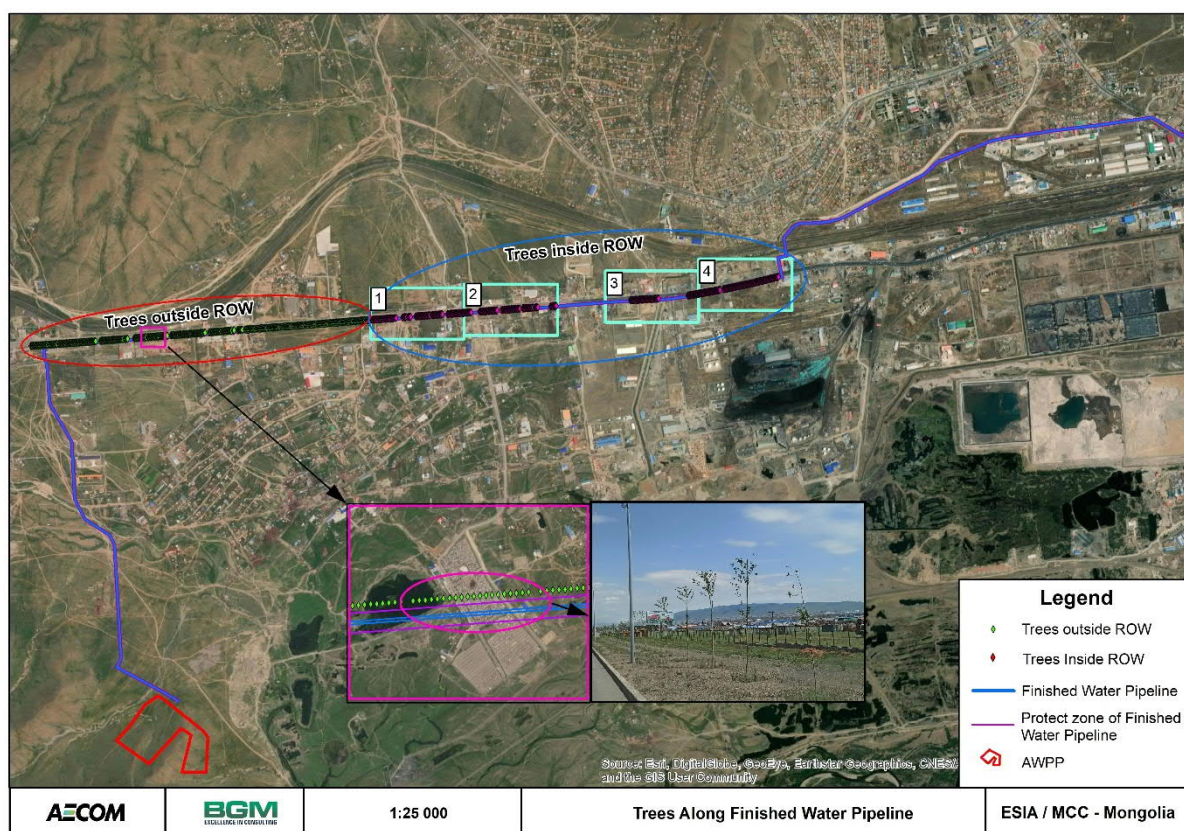
<b>POTENTIAL IMPACT</b>
Disturbance and removal of planted trees along the finished water pipeline
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires business entities eliminating or suspending their activities if they adversely affect the environment in breach of environmental legislation, standards and permissible maximum levels.</li> </ul> </li> <li>MNS 6774:2019 Transplanting and care of large trees seedlings. Technical requirement               <ul style="list-style-type: none"> <li>This standard applies to the transplanting and maintenance of large trees and seedlings for landscaping of public, limited and special purpose green areas in cities and towns. The following documents are cited in this standard, and in the event of changes to these standards, reference shall be made to the most recent official material:                   <ul style="list-style-type: none"> <li>MNS 4969: 2000 Organization of training. Basic rule</li> <li>MNS 6139: 2010 Seedlings of coniferous trees. Technical requirement</li> <li>MNS 6254: 2011 Growing seedlings of trees and shrubs. General requirement</li> <li>MNS 6258-1 : 2011 Planting and pitting seedlings hole. General requirement</li> <li>MNS 6258-2 : 2011 Caring of tree and brush seedlings</li> <li>GOST 24909: 81 Seedlings of ornamental deciduous trees. Specifications</li> <li>GOST 25769-83 Conifers seedlings for planting in towns. Specifications</li> <li>GOST 28829-90 Seedlings of decorative trees and bushes in containers. Specifications</li> </ul> </li> </ul> </li> <li>Mongolian Law on Environmental Impact Assessment               <ul style="list-style-type: none"> <li>Requires preparing a report presenting the findings of the detailed environmental impact assessment and develop an environmental management plan.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Requires that impacts to biodiversity be offset.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Relocation of affected trees and revegetation of disturbed soils</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Tree Relocation and Revegetation</b> The removal of trees and other vegetation will be kept to the minimum necessary to accommodate the permanent works that are indicated by the project drawings. The Contractor will prepare, submit, and implement a Tree Replanting and Revegetation Plan for the Engineer's written approval. The plan will include but not be limited to the following:

- Follow all applicable ESMP mitigation measures and Contract documents.
- Replant all removed trees at locations where they will not interfere with safety or proposed project assets.
- The existing trees in the protection zone of the pipeline will be removed and replanted, rather than replaced, whenever possible. If a tree is damaged during removal it will be replaced.
- In concurrence with the Engineer, trees outside of the protection zone that hinder or obstruct work, or interfere with project assets will be removed and replanted, rather than replaced, whenever possible. If a tree is damaged during removal it will be replaced.
- The existing trees will be replanted next to the protection zone if there is room available; where there is no room, they will be replanted in a different location based on discussion with the local authority and concurrence of the Engineer.
- Replanted and replaced trees that die within 1 year of planting will be replaced by the Contractor.
- Ensure that any exposed surfaces are revegetated at the completion of works and in accordance with instructions of the Engineer.
- A replanting and revegetation schedule.
- A monitoring plan and schedule to ensure success in the first year of replanting and revegetation

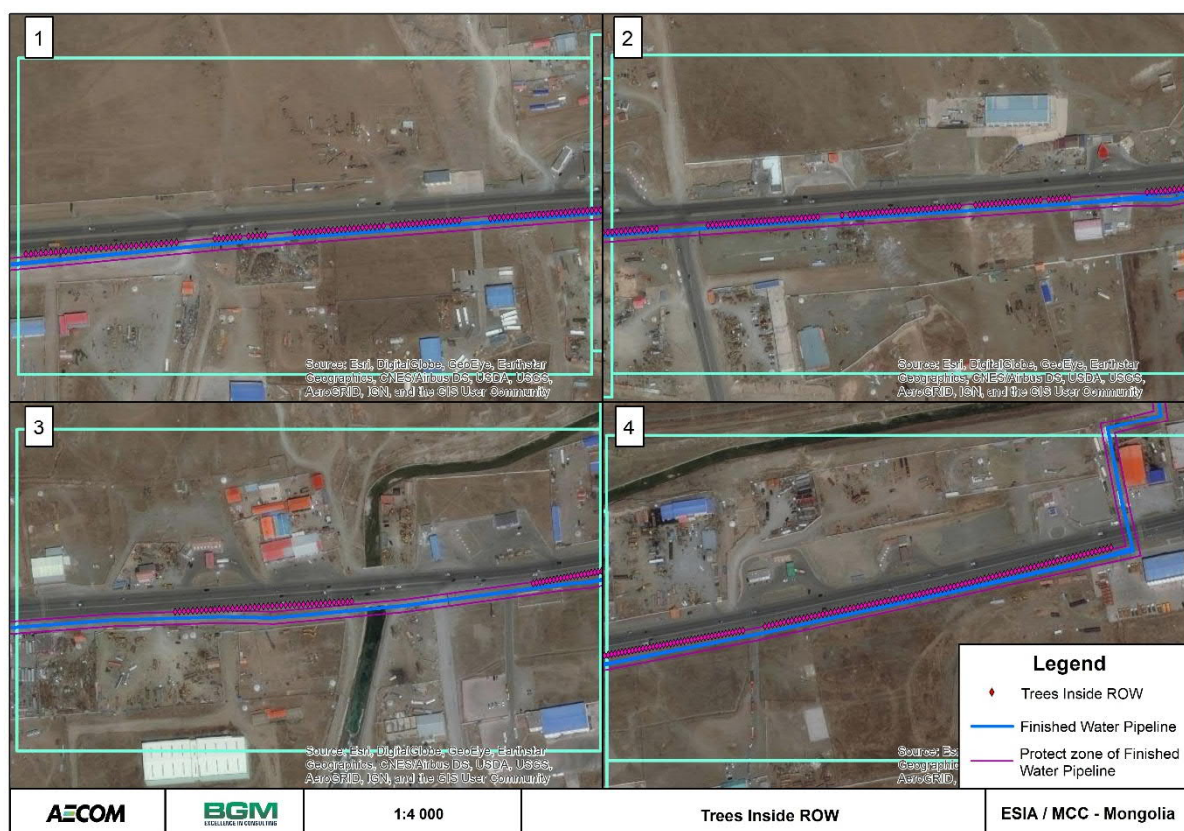
Trees along the finished water pipeline are cared for by the local authority. After replanting, in concurrence of the Engineer, the Contractor will provide formal notice to local authority to resume plant care.

#### LOCATIONS:

As indicated in the following figures, there are 879 trees along the AH3 Highway, parallel to the route of the finished water pipeline; of these 397 are within the protection zone of the pipeline and will need to be removed and relocated. In concurrence with the Engineer, the Contractor may identify trees outside of the protection zone requiring removal as they hinder or obstruct works, or interfere with project assets.







## MONITORING

### Document submission and approval of plan

#### LOCATIONS:

As indicated in the above figures, there are 879 trees along the AH3 Highway, parallel to the route of the finished water pipeline; of these 397 are within the protection zone of the pipeline and will need to be removed and relocated. In concurrence with the Engineer, the Contractor may identify trees outside of the protection zone requiring removal as they hinder or obstruct works, or interfere with project assets.

#### INDICATORS AND SUCCESS CRITERIA:

##### Indicators:

- Implementation of tree replanting and revegetation measures
- Submission of construction-phase Tree Planting and Revegetation Plan
- Specific impact criteria and indicators specified in approved plan
- Number of trees removed from along the AH3 highway
- Number of trees replanted next to the projection zone
- Number of trees replanted in different locations
- Number of trees replaced
- Hectares of exposed surfaces revegetated

##### Success Criteria:

- Tree replanting plan approval
- All removed trees replanted or replaced
- All replanted or replaced trees survive 1 year or replaced
- All exposed surfaces revegetated within 1 year

#### REPORTING:

- Report communications and written approval of Engineer of the Tree Replanting and Revegetation Plan
- Report monitoring activities and data evaluation findings
- Report impact criteria exceedances and recommended protective actions to be implemented
- Summarize other activities undertaken during reporting period

<ul style="list-style-type: none"> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
REPORTING:	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Schedule as indicated in plan.</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Monitoring schedule as indicated in plan</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### Management Measure Conveyance -7: Mongolian Marmot Protection and Habitat Restoration

<b>POTENTIAL IMPACT</b>
Disturbance of endangered Mongolia marmot ( <i>Marmota sibirica</i> ) and loss and disturbance of marmot habitat
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> <ul style="list-style-type: none"> <li>Mongolian Law on Environmental Protection               <ul style="list-style-type: none"> <li>Requires researching and establishing the potential for State and regional development, the restoration, breeding and raising of endangered animals, protection of soil, water, and air, and for humans to live in a healthy.</li> </ul> </li> <li>Mongolian Law on Fauna               <ul style="list-style-type: none"> <li>Requires the approval of the government based on the conclusions of an environmental impact assessment of the construction of industrial plants, power stations within the territory of extremely rare fauna.</li> </ul> </li> <li>IFC Performance Standard 6               <ul style="list-style-type: none"> <li>Prohibits implementing any activities that leads to a net reduction in the national/regional population of any Critically Endangered or Endangered species over a reasonable period.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Minimize disturbance of Mongolian marmots</li> <li>Habitat restoration to achieve a net gain in Mongolian marmot habitat</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Mongolian Marmot Protection and Habitat Restoration</b> <b>Protection and Habitat Restoration</b> MCA-Mongolia will, with reference to the figure below: <ul style="list-style-type: none"> <li>Designate construction-phase marmot protection zone extending a minimum of 200 meters from the outermost flight burrows</li> <li>Prohibit the operation of any motorized vehicles, including cars and all-terrain vehicles, and restrict foot traffic within construction-phase marmot protection zone by MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel</li> <li>Develop and implement marmot protection training to be required of all construction-phase MCA-Mongolia, Engineer, Contractor, and subcontractor project personnel and visitors to project facilities and construction sites in the vicinity of the AWPP.</li> </ul>

MCA-Mongolia will employ or contract an experienced biodiversity specialist to develop and implement the following Mongolian marmot construction-phase monitoring and long-term protection program

### **Construction-Phase Monitoring and Long-term Protection**

Prepare, submit, and implement Mongolian Marmot Monitoring and Evaluation Plan for the Engineer's written approval, to monitor and evaluate Mongolian marmot population density and structure, reproduction, and mortality in the vicinity of the proposed AWPP and replacement access road and pedestrian path to the Monument to Terror Victims, and existing and proposed walking trail to the sacred ovoo on Songinokhairkhan Mountain. The plan will specify roles and responsibilities for marmot monitoring and evaluation.

The plan may include but not be limited to the following, as determined by the biodiversity specialist and approved by the Engineer:

#### *Mapping*

- Burrow clusters
- Family and individual home ranges
- Vegetation
- BWSE-related and other human encroachment

#### *Monitoring activities*

- Use of drone equipped with thermal imaging camera
- Direct observation aided by binoculars and spotting scopes
- Use of automatic camera trap
- Capture with or without marking

#### *Monitoring parameters*

- Burrow cluster population
- Age of individuals
- Sex of individuals
- Home range size
- Number of families
- Family composition
- Number of pups
- Activity/Behavior
- Predation
- Survival and mortality
- Total population
- Age and sex distribution of population

Observations are to be repeated during the morning and evening active periods.

Monitoring data for the selected parameters will be evaluated as construction, and operation and maintenance progress for changes attributed to loss of marmot habitat or disturbance of marmots. The monitoring and evaluation plan will specify impact indicators and impact criteria determined by the biodiversity specialist and approved by the Engineer.

Exceedance of any of the impact criteria will trigger, ***independent of this management measure***, preparing, submitting, and implementing protective actions, in addition to those specified above, formulated to avoid, minimize, or offset the observed adverse impact.

Such actions may include the following, as well as other measures recommended by the biodiversity specialist:

- Constructed buffers; e.g., vegetated earth berms
- Rock piles where marmots can watch for predators, thermoregulate, and dig burrows
- Spill protection measures
- Permanent Mongolian marmot protection zone
- Driving restrictions; e.g., prohibit or control off-road driving, set speed limits, restrict non-essential traffic to daytime
- Marmot protection and avoidance training
- Warning and interpretive signage

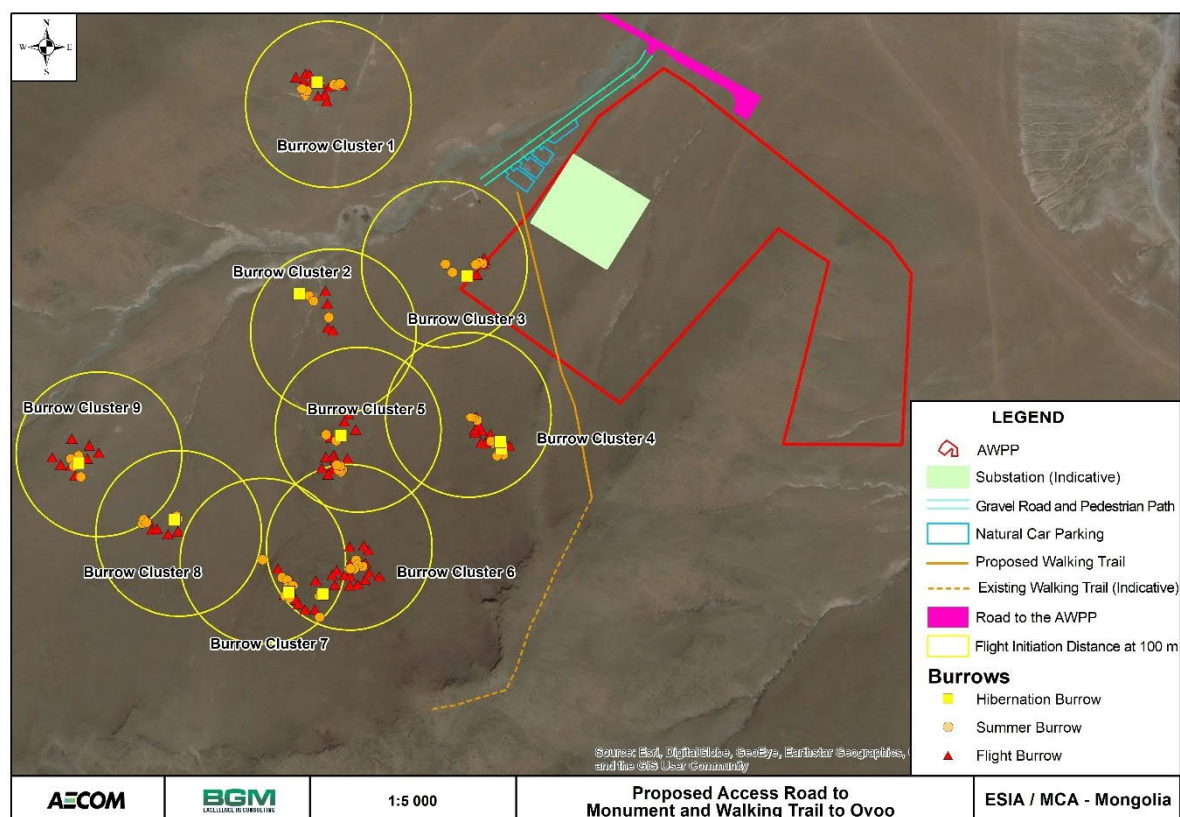


- Supplemental feeding to increase reproduction and survival, and attract marmots away from roads

The Contractor will be requested to provide a quotation to implement such actions identified by the biodiversity specialists, should the impact criteria be triggered.

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the following figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults:



#### MONITORING

Document submission and approval of plan

#### LOCATIONS:

Observed Mongolian marmot burrow clusters in the vicinity of the proposed AWPP and replacement access road and sidewalk to the Monument to Terror Victims and sacred ovoo on Songinokhairkhan Mountain, as located on the above figure, and associated, nearby habitat supporting foraging, including pup-weaning, and dispersal of sub-adults including pup-weaning, and dispersal of sub-adults

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Submission of construction-phase monitoring and long-term protection plan
- Collection and evaluation of Mongolian marmot population density and structure, reproduction, and mortality data
- Specific impact criteria and indicators specified in approved plan

Success Criteria:

- Monitoring and protection plan approval
- Identification of and timely response to changes attributed to loss of marmot habitat or disturbance of marmots

#### REPORTING:

<ul style="list-style-type: none"> <li>Report communications and written approval of Engineer of Construction-Phase Monitoring and Long-Term Protection Plan</li> <li>Report monitoring activities and data evaluation findings</li> <li>Report impact criteria exceedances and recommended protective actions to be implemented</li> <li>Summarize other activities undertaken during reporting period</li> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Annual, beginning prior to construction mobilization and continuing throughout construction, commissioning, and contract operations period Year 1 and Year 2</li> <li>Late March to late September monitoring season, comprising four monitoring periods: <ul style="list-style-type: none"> <li>Late March/early April (post hibernation)</li> <li>Late June/early July (pups feeding outside burrows)</li> <li>Mid-August (newborn survival and mortality)</li> <li>Late September (pre hibernation)</li> </ul> </li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in CESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> MCA-Mongolia and Biodiversity specialist employed by or contracted to MCA-Mongolia; construction by Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b> <i>Implementation:</i> Biodiversity specialist <i>Reporting:</i> Biodiversity specialist and Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.3 Waste Management

#### Management Measure Conveyance -8: Waste Management

<b>POTENTIAL IMPACT</b>
Risks and adverse impacts of handling, storing, treating, and disposing of waste
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b> Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>Mongolian Law on Hazardous and Toxic Chemicals <ul style="list-style-type: none"> <li>Requires depositing the waste based on conclusion of the related professional organization to the place determined by the district governor.</li> </ul> </li> <li>Mongolian Law on Sanitation <ul style="list-style-type: none"> <li>Prohibits disposing waste in the places other than the specified points.</li> </ul> </li> <li>Mongolian Law on Waste <ul style="list-style-type: none"> <li>Prohibits establishing centralized waste disposal sites in urban settlement areas, water sanitary and protection zones and mining areas.</li> </ul> </li> </ul>

- Government of Mongolia Resolution No. 135 of 2002 addressing the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of hazardous waste
- Government of Mongolia Resolution No. 116 of 2018 addressing Articles 7.1.2 and 7.1.3 of the Law on Waste (repealed Government Resolution No. 135 of 2002).
- Joint Order No. A-320/305 of Minister of Nature, Environment and Tourism and Minister of Health of 2011 addressing the procedures of the disposal of medical wastes
  - Requires providing personal protective equipment to the organization's waste management officer.
- Minister's Order No. 404 of 2006 of Ministry of Nature, Environment and Tourism addressing the procedure of the disposal and landfill of waste
- Minister's Order No. A/443 of 2018 addressing Articles 4.4.1, 4.4.2, 4.4.3 of the Law on Hygiene (repealed Minister's Order No. 404 of 2006).
- IFC Performance Standards 3 and 4
  - Encourages recovering and reusing waste in a manner that is safe for human health and the environment.
- IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning
  - Provides guidance on management of non-hazardous solid waste generated at construction sites and associated facilities, hazardous materials, and wastewater discharges.

#### OBJECTIVES

- Effectively manage waste by minimizing waste generation and safely handling, storing, treating, and disposing of generated wastes

#### MANAGEMENT MEASURE

##### Waste Management

The Contractor will:

- Comply with Construction Contract Documents Section V, Works Requirements, Section 01030 Special Requirements:
  - Paragraph 1.04.E Hazardous Waste Management Plan
  - Paragraph 1.14 Disposal of Excess Material
  - Paragraph 1.21 Disposal of Debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01110 Environmental Protection Procedures:
  - Paragraph 3.04.I, requiring the disposal of all debris and excess material outside wetland or floodplain areas in an environmentally sound manner
  - Paragraph 3.05.A, prohibiting the use of burning at the project site for the disposal of refuse and debris
- Comply with Construction Contract Documents Section V, Works Requirements, Section 01610 Delivery, Storage and Handling:
  - Paragraph 1.05.C Storage and Protection
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02100 Site Preparation:
  - Paragraph 1.07.D, requiring the legal disposal of all waste and surplus material
  - Paragraph 3.03 Disposal of Waste Materials
- Comply with Construction Contract Documents Section V, Works Requirements, Section 02210 Earth Excavation, Backfill, Fill and Grading:
  - Paragraph 3.11 Reuse and Disposal of Surplus Excavated Materials
- Fully comply with the requirements of this management measure
- Provide in storage locations and principle points of use material safety data sheets (MSDSs) for all stored materials in Mongolian, English, and any other languages as appropriate
- Provide 110%-capacity secondary containment or 25% of the capacity of all the total volume of the stored individual containers within the bund, whichever is larger, for all storage of liquid hazardous materials, including, but not limited to, waste oil and solvents
- Do not store waste oils for extended periods in underground sumps

- Empty and inspect regularly tanks and sumps for any signs of cracks or holes
  - Record findings of inspections
  - Repair any cracks or holes
  - Record any repairs conducted
- Make available on site spill kits, protective equipment, and other necessary equipment where hazardous materials are handled, to clean and mitigate spills
- Locate appropriate first aid close to hazardous material storage areas, including, but not limited to, eye-wash, showers, and first aid kits
- Only transport hazardous materials using operators licensed and approved by the Engineer for the specific material
- Implement the following waste management hierarchy, in the following order of preference:
  - Waste avoidance and reduction at source
  - Waste reuse and recycling
  - Waste storage, treatment, and disposal to local, Mongolian, and international standards
- Classify all wastes according to the following and based on internationally accepted regulations, guidelines, definitions, and methodologies:
  - Mineral waste
  - Non-hazardous waste, including domestic waste and inert waste
  - Hazardous waste, including medical waste
  - Wastewater
- Segregate, securely contain, and monitor waste at the source of generation pending treatment, transport, or disposal
- Prohibit open burning of non-hazardous and hazardous solid waste
- Transfer recyclable wastes only to facilities operated by licensed recycling contractors, subject to assessment by the Engineer of the contractors and facilities
- Transfer non-hazardous waste, other than recyclable wastes, only to waste disposal facilities licensed in accordance with applicable Mongolian laws and regulations
- Sterilize medical waste by autoclave in 121°C for at least 20 minutes prior to transfer to disposal and a licensed facility
- Properly store on site all hazardous wastes for which there is not an engineered and approved treatment or disposal method available until a treatment and/or disposal route becomes available
- Maintain an inventory by location, specifying quantity per month and cumulative total, and detailing:
  - Wastes generated
  - Wastes sent for off-site recycling
  - Wastes subject to hazardous waste treatment
  - Wastes subject to non-hazardous waste disposal
  - Unrecyclable hazardous wastes stored
- Provide waste management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the Contractor's site-specific Waste Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter
- The Contractor will prepare and submit for the Engineer's written approval a site-specific Waste Management Plan and associated procedures that, as a minimum:
  - Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
  - Assigns roles and responsibilities for waste management
  - Disposition of hazardous wastes for which no engineered and approved treatment or disposal method is available

#### LOCATIONS:

All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of

#### MONITORING

Document:

- Provision, maintenance, and/or updating of:

<ul style="list-style-type: none"> <li>- MSDSs</li> <li>- Secondary containment capacity for all storage of liquid hazardous materials</li> <li>- Tanks and sumps inspection records</li> <li>- Spill kits</li> <li>- First aid</li> <li>- Waste inventory</li> <li>- Waste management training</li> <li>• Submission and approval of site-specific Waste Management Plan</li> </ul>	
<b>LOCATIONS:</b> All construction sites, construction camps, and temporary facilities where waste is generated, stored, treated, or disposed of	
<b>INDICATORS AND SUCCESS CRITERIA:</b> <b>Indicators:</b> <ul style="list-style-type: none"> <li>• Submission of site-specific Waste Management Plan</li> <li>• Volumes of waste generated</li> <li>• Volumes of waste sent for off-site recycling</li> <li>• Number of reported non-compliances with the controls identified in the plan</li> <li>• Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Number of reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> <b>Success Criteria:</b> <ul style="list-style-type: none"> <li>• Approval of site-specific Waste Management Plan</li> <li>• Minimize volume of waste generated</li> <li>• Maximize volume of waste sent for off-site recycling</li> <li>• Zero: <ul style="list-style-type: none"> <li>• Reported non-compliances with the controls identified in the plan</li> <li>• Reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment</li> <li>• Reported waste incidents</li> <li>• Number of waste related community complaints</li> <li>• Instances of off-site contamination identified</li> </ul> </li> </ul>	
<b>REPORTING:</b> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Waste Management Plan</li> <li>• Update performance relative to indicators and comparison to respective success criteria, as listed above and detailed in the plan</li> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Management measure and plan implementation throughout construction</li> </ul>	<b>MONITORING:</b> <i>Implementation:</i> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document actions taken to meet management measure and plan requirements, and compliance and non-compliance as they occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>• Monthly in CESMP update</li> </ul>



RESPONSIBILITY	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

## 3.4 Social and Gender Inclusion

### Management Measure Conveyance -9: Labor Management

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Professional management and conditions of labor</li> <li>Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> <li>Women's short-term employment in construction and engineering-related work</li> <li>Potential alleviation of poverty in local area</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Constitution of Mongolia             <ul style="list-style-type: none"> <li>Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>Mongolian Civil Code             <ul style="list-style-type: none"> <li>Requires providing office space, tools and equipment necessary to ensure employees' health.</li> </ul> </li> <li>Mongolian Law on Gender Equality             <ul style="list-style-type: none"> <li>Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>Mongolian Law on Labor             <ul style="list-style-type: none"> <li>Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>Prohibits employing children under the age of 16 or under 18 in dangerous industries, including construction</li> </ul> </li> <li>Mongolian Law on Minimum Wage             <ul style="list-style-type: none"> <li>Minimum wage is fixed by National Tripartite Committee on Labor and Social Consensus representatives.</li> </ul> </li> <li>Mongolian Law on the Protection of the Rights of the Child             <ul style="list-style-type: none"> <li>Prohibits employing children in any work that is likely to harm their health or morale, and exploiting or paying unjust wages to children</li> </ul> </li> <li>Mongolian Law on Social Protection of Disabled Persons</li> </ul>



- Prohibits building any buildings and facilities that do not meet needs and requirements of persons with disabilities.
- **Mongolian Law on Combating Human Trafficking**
  - Requires regulating the workplace to ensure the implementation of the legislation on combating human trafficking, and if it is not specified, it shall be obliged to comply with the instructions, recommendations, statements and instructions given by the competent authorities and officials.
- **Mongolian Law on Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad**
  - Regulates relations with respect to employment of a Mongolian citizen abroad and a foreign citizen in Mongolia, and protection of their rights and interests.
  - Reinforces provisions of the Constitution of Mongolia, Labor Law, Social Insurance Law, and other related legal acts, and legal status of a foreign citizen.
- **IFC Performance Standard 2**
  - Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.
  - Contractor will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this performance standard and national law.
  - Contractor will provide workers with documented information that is clear and understandable regarding their rights under national labor and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.
  - Contractor will not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. Contractor will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Contractor will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women. The principles of non-discrimination apply to migrant workers.
  - Prohibits employment of child labor.
- **Millennium Challenge Corporation Counter-Trafficking in Persons Policy (C-TIP Policy)**
  - Requires contractors to take a zero-tolerance policy with regard to human trafficking and to actively manage employment conditions to prevent trafficking in persons and related activities and specifies remedies that the MCA-Entity may take in response to confirmed cases of TIP..
- **Millennium Challenge Account Social and Gender Integration Plan (SGIP)**
  - Sets out guidelines for Contractors related to social risk mitigation measures in infrastructure, including making working conditions suitable for both male and female employees
  - Requires developing and implementing an employment plan that prioritizes using local labor particularly from the Area of Influence of the project
  - Sets a target to encourage contractors to employ as workers at least 30% women of all workers at each skill/occupational level
  - Encourages Contractors to cooperate with technical and vocational education (TVET) centers and professional associations to hire TVET graduates.
- **Millennium Challenge Corporation Guidance Note to MCAs on Sexual Harassment**
  - Requires that contractors are well-informed about existing anti-sexual harassment policies and procedures, and that contractors meet the requirements in the standard bidding documents.
- **Ministry of Construction and Urban Design (MCUD) Gender Responsiveness Policy**

- Calls for gender targets in employment via “international and domestic tenders, so that one gender should not be lower than 15 percent among workers, and 25 percent among decision makers.”
- Ministry of Labor and Social Welfare Order (2016)
  - Expanded the types of hazardous work prohibited for children under the age of 18 to include construction
- International Labor Organization fundamental conventions, and International Human Rights instruments and conventions

## OBJECTIVES

The Labor Management Plan ensures that contractors and their workers have clear expectations about the behaviors and conditions expected of the Contractor and all workers.

- Promote fair treatment, non-discrimination, and equal opportunity of workers
- Promote local labor opportunities
- Achieve a target of women's employment as 30% of all labor at each skill/occupational level
- Establish and maintain, a constructive worker-management relationship
- Protect workers, including “vulnerable” categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the supply chain
- Avoid the use of forced labor
- Maximize the beneficial impact of the project on the affected communities

## MANAGEMENT MEASURE

### Labor Management

The MCA-Mongolia or its representative's Social Safeguards Team (SST) will:

- Encourage Contractor to employ local unskilled and semi-skilled labor, particularly youth and women, and to procure goods and services from local businesses and entrepreneurs
- Facilitate the Contractor's cooperation with the local District Labor Offices
- Facilitate the publication of vacancies and procurements within affected communities
- Facilitate the holding of job fairs and procurement workshops within affected communities to support local applicants to apply for jobs and local business and entrepreneurs to bid
- Gather names of interested workers from project affected households and through community information programs and consultation meetings
- Share the names of interested workers with Contractor and District and khoroo Labor Offices
- Encourage Contractor to employ women at a rate of at least 30% of personnel at each skill/occupational level
- Facilitate Contractors' engagement with relevant university engineering programs, technical and vocational education and training (TVET), and professional associations to 1) identify and recruit qualified job applicants and 2) establish internships and apprenticeships

The Contractor will:

- Fully comply with the requirements of this management measure
- Perform the work in accordance with relevant sections of the ESMP

#### *Access to Employment*

The Contractor will:

- Publish vacancies (listing the required qualifications for all categories of employment) within project-affected communities and at District and khoroo offices and provide such information to the Engineer and during each community meeting
- Publish and communicate employment opportunities listing the required qualifications for all categories of employment city-wide, and beyond in Mongolia, if the vacancies cannot be filled from local communities
- Ensure that a staff person responds to questions from the local population regarding employment and procurement opportunities
- Develop an employment forecast and a written recruitment strategy to: 1) encourage the employment of qualified individuals among the local population(s) in project construction and ancillary activities in all phases, with particular focus on women and youth; 2) achieve a target of

women's employment at least 30% of personnel at each skill/occupational level; and 3) provide training for local construction brigades on how to be effective contractors

- Through the Contractor's Social Safeguards Officer, liaise with the MCA-Mongolia or its representative's SST and local labor offices to provide support with the job application process, encourage local employment (including women's employment), and publicize a fair, consistent and transparent recruitment process
- In disseminating information on potential employment opportunities, take steps to maximize outreach, using all forms of media that may be appropriate
- Ensure that all staff have written employment contracts specifying fair employment conditions for equal work to men and women, and fulfilling all conditions specified under the Mongolian Law on Labor defining the contracts

The Contractor is encouraged to:

- Create pay bands for each category of worker to ensure equal pay for equal work

As feasible, the Contractor will:

- Develop and submit a plan for providing on-the-job training and skills transfer opportunities to the local labor force
- Engage with training, education, and professional organizations—such as Technical and Vocational Education and Training, Implementing Agency of the Ministry of Labor and Social Protections, Mongolian University of Science and Technology, and the Mongolian Builder's Association—to recruit qualified applicants, and provide apprenticeships and internships for students who study water engineering and relevant subjects at university
- The Contractor shall note contract clauses on "Gender," "Engagement of Staff and Labor," "Foreign Personnel," "Prohibition of Forced or Compulsory Labor," "Prohibition of Harmful Child Labor," "Employment Records of Workers," and "Non-Discrimination and Equal Opportunity."

#### *Local Procurement*

The Contractor will:

- Proactively procure goods and services from local businesses and entrepreneurs in Khan-Uul and Songinokhairkhan Districts and Ulaanbaatar, and members of targeted disadvantaged groups (e.g., women, people with disabilities), achieved through:
  - Publicizing procurements within the targeted geographical area or targeted group, for example at the District and khoroo offices and via notice boards, print media (newspapers, etc.), recruitment agencies, or job and career fairs
  - Publicizing and hold procurement workshops within the targeted geographical area or targeted group
  - Adding priority criteria for businesses and entrepreneurs in the targeted geographical area or members of the targeted group to the selection procedure
- In disseminating information on potential service procurement opportunities, take steps to maximize outreach, using all forms of media that may be appropriate

#### *Workplace Environment*

The Contractor will:

- Establish, execute, and enforce a Worker Behavior Code of Conduct on which all employees will be briefed, that all employees are required to sign, and that mandates immediate dismissal for serious offences including sexual harassment, violence, or confirmed cases of engagement in trafficking in persons. The Code will specify:
  - Expectations of worker behavior, and penalties for transgression
  - MCC and Mongolian legal definitions of trafficking in persons (TIP), zero-tolerance for TIP, and remedies that the MCA Entity may take in response to confirmed cases of engagement of trafficking in persons
  - Zero-tolerance for gender-based violence
  - Compliance with the Contractor's Anti-Sexual Harassment Policy and notification of the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Rights of employees to a grievance mechanism, holidays, and cultural and festival access
  - Conditions for work camps, shelter, water and sanitation, food, and security

- The responsibility of all workers, regardless of their role or duration of employment, to review and acknowledge the Workers' Code of Conduct by signing the code sheet
  - The requirement to respect local customs and practices
- Establish and execute a grievance redress procedure that:
  - Formalizes a system for receiving and managing internal complaints of sexual harassment, gender-based violence, or issues of trafficking persons (including engaging in commercial sex with a person under 18 years of age)
  - Guarantees confidentiality to makers of allegations
  - Designates the Contractor's Social Safeguards Officer or other officer as responsible for collaborating with the human resources department on the grievance redress procedures
  - Refers to the Contractor's Sexual Harassment Incident Reporting and Referral Plan for allegations of sexual harassment
  - Specifies that the Contractor's zero-tolerance for gender-based violence addresses any complaints of gender-based violence against its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism
  - In cases of discrimination against women or of allegations of sexual harassment or violence, requires that the Contractor's Social Safeguards Officer contact the MCA-Mongolia or its representative's SST to include them in the investigation and appoint a third party—such as a representative from an NGO such as the Centre for Gender Equality or equivalently qualified, experienced organization—to lead the investigation
- The Contractor shall note the contract clause on "Prohibition of Sexual Harassment"
- The Contractor shall note the contract clause on "Facilities for Staff and Labor" and provide suitable gender-segregated facilities to enable the safe employment of both men and women – e.g. Toilet facilities, changing facilities on all sites and enabling physical access to office accommodation for people with disabilities

### *Training*

The Contractor will:

- Provide training to enhance the skills of employees using on-the-job training, internships, and apprenticeships.
- Mandate for all employees, before each worker starts work on the site, induction packages that include:
  - Employment rights and conditions, including non-discrimination and equal opportunity
  - The Contractor's responsibility to "adopt recruitment, hiring and retention practices that support the employment of women and staff from diverse backgrounds" per the contract clause on "Engagement of Staff and Labor," the Contractor's employment forecast and recruitment strategy, and the Contractor's Gender Integration and Social Inclusion Plan (described below)
  - Gender-based violence
  - Contractor's Anti-Sexual Harassment Policy – including awareness of what constitutes sexual harassment, exploitation, and abuse and the Contractor's Sexual Harassment Incident Reporting and Referral Plan
  - Using the internal Grievance Mechanism for allegations of gender-based discrimination
  - Rights to have access to local festivals
  - Cultural sensitivities, and social norms and practices in each area
  - Expectations on avoiding poor relations between employees and local communities caused by behavior relating to alcohol, gambling, prostitution, illegal drug use, violence and sexual abuse of women, minors and lesbian, gay, bisexual, transgender, queer, and others (LGBTQ+) persons
  - Countering the Trafficking in Persons Response Plan – awareness of responsibilities to counter the trafficking of people around the project area, the remedies that the Contractor and the MCA Entity may apply, and mechanisms for reporting suspected instances of TIP with the Contractor's TIP Response Plan

- Awareness of the possibilities of the transmission of HIV/AIDS and communicable illnesses and how to prevent HIV/AIDS transmission
- Undertake a series of employment and social plan inductions and employee awareness programs that:
  - All employees must attend at the commencement of employment and over the employment period twice yearly
  - Incorporate toolbox talks that include reinforcement of all training programs
- Commission training modules on gender integration and social inclusion topics for all employees at intervals agreed with the MCA-Mongolia or its representative's SST
- Require that the Social Safeguards Officer, together with the MCA-Mongolia or its representative's SST Community Liaison Officers, conduct awareness raising with workers on child labor issues in the local community as part of an ongoing community awareness program on social issues
- These toolbox talks will include ways that workers can report suspected child labor to the District Children, Youth and Family Offices, and the MCA-Mongolia or its representative's Social Manager

#### *Site-specific Labor Management Plan*

The Contractor will prepare and submit for the Engineer's written approval a site-specific Labor Management Plan that:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Includes the Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan and the Workers' Code of Conduct
- Is consistent and compliant with:
  - Mongolian Law on Labor
  - Relevant aspects of the MCC Gender Policy coordinated and agreed with the MCA-Mongolia or its representative's SST and operated by the Contractor's Social Safeguards Officer
  - The MCC Policy on Counter-Trafficking in Persons
- Assigns roles and responsibilities for labor management

#### LOCATIONS:

All construction sites and temporary construction facilities

#### **MONITORING**

MCA-Mongolia or its representative's SST:

- Monitor implementation of the Contractor's Labor Management Plan and Worker Behavior Code of Conduct, including prohibitions against trafficking in persons, gender-based violence, sexual harassment, and child labor
- Monitor implementation of the Contractor's employment recruitment strategies and assist Contractor to reach potential workers among local women, youth, and people from disadvantaged groups
- Monitor participation by all parties in the Contractor's internal grievance redress procedure and external project Grievance Redress Mechanisms

Contractor:

- Record results of Contractor's labor management responsibilities, with all data and statistics disaggregated by age and gender, following, at a minimum, the contract clause on "Employment Records of Workers" and recording, for each worker hiring and leaving dates, along with duration (days) of employment and skills/occupational category and home location of workers (project-affected district/khoroov, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia)
- Document implementation of the requirements above for the Labor Management Plan, including all recruitment activities
- Document Worker Behavior Code of Conduct infringements and outcomes, and internal grievance redress activities under the Contractor's internal grievance process

#### LOCATIONS:



All construction sites and temporary construction facilities
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Required plans written, approved, and implemented</li> <li>• Number, content, and outcome of employment against home location (project-affected district/khoroos, elsewhere in Ulaanbaatar or Mongolia, outside of Mongolia), gender, age brackets (under 30, 30 to 49, 50 and over), and total days of employment for each individual worker</li> <li>• Use of written contracts with defined pay scales by employment activity</li> <li>• Employment recruitment activities, and interactions with local employment offices and communities, professional associations, TVET centers</li> <li>• Percent of all employees that are workers from project-affected districts/khoroos and elsewhere in UB/Mongolia</li> <li>• Percent of all employees that are women, disaggregated by skill/occupational level</li> <li>• Records of attendance and dates of all trainings and toolbox talks delivered on social and gender topics</li> <li>• Number of grievance redress actions, the number of days necessary to resolve them, and their outcomes</li> <li>• Number of apprenticeship and internships established and complete</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ 100% of contractor and employees have attended the child labor toolbox session on identifying and reporting child labor incidents</li> <li>○ Zero tolerance of child labor – no child labor on site <ul style="list-style-type: none"> <li>▪ Any cases of child or forced labor are reported and dealt with in a timely, manner, with respect for the child(ren) and families affected</li> </ul> </li> <li>○ Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>○ Achievement of 30% or more employment of women as a percentage of all staff, in each skill/occupational category</li> <li>○ Employment of young people and "vulnerable" and excluded groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguard Team (SST) <ul style="list-style-type: none"> <li>▪ Apprenticeships and internships established and completed for each construction season</li> </ul> </li> <li>○ All worker and community complaints about sexual harassment are: a) addressed in a timely manner; and b) resolved through the Contractor's Sexual Harassment Incident Referral and Reporting Plan</li> <li>○ 100% of employees and sub-contractors sign the worker Code of Conduct</li> <li>○ Resolution of 100% internal grievances within a duration to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> </ul> </li> </ul>
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Labor Management Plan</li> <li>• Report enforcement actions related to the Anti-Sexual Harassment Policy and implementation of Sexual Harassment Incident Reporting and Referral Plan</li> <li>• Summarize activities undertaken during reporting period, using the categories above: 1) Access to Employment 2) Local Procurement 3) Workplace Environment 4) Training and 5) Site-specific Labor Management Plan</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>
<b>SCHEDULE</b>



MANAGEMENT MEASURE:	MONITORING:
<b>Implementation:</b> <ul style="list-style-type: none"> <li>Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>Training prior to starting any construction activities and at the start of each construction season, at least annually thereafter</li> <li>Implementation of above provisions throughout pre-construction and construction</li> </ul>	<b>Implementation:</b> <ul style="list-style-type: none"> <li>Document communications and written approval of Engineer as they occur</li> <li>Document training as it occurs</li> <li>Document implementation of above provisions as it occurs</li> <li>Maintain employee records as required above</li> </ul> <b>Reporting:</b> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
RESPONSIBILITY	
<b>MANAGEMENT MEASURE:</b> <b>Implementation:</b> Contractor <b>Oversight:</b> MCA-Mongolia or its representative	<b>MONITORING:</b> <b>Implementation:</b> Contractor <b>Reporting:</b> Contractor <b>Oversight:</b> MCA-Mongolia or its representative

### Management Measure Conveyance -10: Gender Integration and Social Inclusion (GSI)

POTENTIAL IMPACT
<p>Beneficial impacts to be enhanced:</p> <ul style="list-style-type: none"> <li>Increased short-term employment for women Opportunities for local labor and supply of goods and services, and provision of jobs with fair and competitive wages</li> </ul> <p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>Discrimination against women</li> <li>Increased foreign labor, reducing local employment opportunities</li> <li>Use of child labor</li> <li>Use of forced labor</li> <li>Use of trafficked labor</li> <li>Exploitation of workers and Labor Code violations</li> <li>Sexual harassment</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Millennium Challenge Account Social and Gender Integration Plan (SGIP)             <ul style="list-style-type: none"> <li>Encourages contractors to prioritize using local labor, particularly workers from the project affected areas and encourages contractors to employ women workers as at least 30% ,</li> </ul> </li> <li>Millennium Challenge Corporation Gender Policy             <ul style="list-style-type: none"> <li>The MCC Gender Policy states that countries will ensure that both women and men have opportunities for meaningful participation throughout the consultative processes related to a Compact program.</li> </ul> </li> <li>IFC Performance Standard 1             <ul style="list-style-type: none"> <li>Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> </ul> </li> <li>IFC Performance Standard 2             <ul style="list-style-type: none"> <li>Pursuit of economic growth through employment creation and income generation accompanied by protection of the fundamental rights of workers.</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>○ Citizen has the right to free choice of employment, favorable conditions of work, remuneration, rest, and private enterprise.</li> </ul> </li> <li>• Mongolian Law on Gender Equality <ul style="list-style-type: none"> <li>○ Prohibits discriminating against gender, sex, pregnancy, or family status in employment and labor relations.</li> </ul> </li> <li>• Mongolian Law on Labor <ul style="list-style-type: none"> <li>○ Prohibits discriminating against race, social origin or status, wealth, religion, or ideology</li> <li>○ Prohibits employing children under the age of 16 – under 18 in dangerous industries e.g. construction</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<p>The Gender Integration and Social Inclusion (GSI) Plan complements the Labor Management Plan and provides additional management steps to address GSI considerations with respect to workers and local communities.</p> <ul style="list-style-type: none"> <li>• To promote the fair treatment, non-discrimination, and equal opportunity of workers.</li> <li>• To encourage the employment of women as at least 30% of the Contractor's workforce, calculated over full and part time positions as a percentage of total number of staff hired in the life of the contract at each skill/occupation level</li> <li>• To enable local people, particularly youth and people in project-affected districts/khoroos to gain short-term employment and training opportunities</li> <li>• Maximize the perceived beneficial impacts of the BWSE project on the project affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Gender Integration and Social Inclusion</b>
<ul style="list-style-type: none"> <li>• Under the Gender Integration and Social Inclusion Plan, the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure the widest exchange of information between the Contractor and the local population and Labor Offices on planned and continuing works and employment opportunities through a program of community consultations and participatory meetings.</li> <li>• The Contractor will prepare and submit for the Engineer's written approval a Contractor's Gender Integration and Social Inclusion Plan, which will be: <ul style="list-style-type: none"> <li>○ Consistent with the Mongolian Law on Labor and</li> <li>○ Consistent with the MCC Gender Policy's emphasis on community consultation and participation</li> <li>○ Consistent with IFC Performance Standard 1: Assessment and Management of Environmental and Social Risk and Impacts</li> <li>○ Agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer</li> </ul> </li> <li>-</li> <li>- <i>Community Engagement</i> <ul style="list-style-type: none"> <li>○ The Contractor will hold at least one meeting in each project-affected District and khoroo office prior to construction to inform community members of the expected conduct of workers and the contents of the Labor Management Plan, and thereafter monthly, minimally covering the following: <ul style="list-style-type: none"> <li>○ Efforts to hire local labor and the Contractor's employment forecast</li> <li>○ Efforts to maximize women's employment</li> <li>○ Efforts to maximize local procurement and the Contractor's procurement forecast</li> <li>○ Prohibitions against child labor and forced labor in supply chains</li> <li>○ Zero-tolerance of trafficking in persons, MCC and Mongolian legal definition of trafficking in persons, and Contractors' Counter-Trafficking in Persons Response Plan</li> <li>○ Zero-tolerance of gender-based violence</li> <li>○ Contractor's Anti-Sexual Harassment Policy and Sexual Harassment Incident Reporting and Referral Plan</li> </ul> </li> </ul> </li> </ul>

### *Expanding Short-Term Employment Opportunities*

- The Contractor will actively consider working with the existing construction brigades to enable local labor currently organized into brigades to gain employment. The brigades may require additional training to enable them to work on this large scale project – training in:
  - Modern tools and techniques where needed
  - Brigade internal labor management, accounting, and estimation techniques
- As referenced in the Labor Management Plan and its recruitment strategy, the Contractor will encourage the employment of qualified individuals among the local population(s) in project activities, with particular focus on women, youth, and disadvantaged groups. This may include small-scale supply contracts or services, with announcement of jobs published on project information boards, in District and khoroo Labor Offices and with information on employment disseminated by the Contractor's Social Safeguards Officer, the MCA or its representative, or other means approved by the Engineer.
- Where appropriate, the Contractor will provide training to enhance the skills of local people using on-site apprenticeships and internships
- As referenced in the Labor Management Section above, the Contractor is encouraged to cooperate with Technical and Vocational Education and Training Centers and professional associations and to draw workers from among their graduate and members

#### *- Local Procurement*

- The Contractor will develop and submit a procurement forecast of all goods and services that could be procured locally. The MCA-Mongolia or its representative's Social Safeguards Team will assist in disseminating this information to local communities with the Contractor's Social Safeguards Officer.
- The Contractor will develop and submit for review and approval by the PMC, a procurement strategy to inform local communities and businesses of opportunities to provide goods and services to the Contractor and to project workers, particularly targeting small businesses and those owned by women.
- The Contractor Social Safeguards Officer and MCA-Mongolia or its representative's Social Safeguards Team will hold community meetings to inform people about the procurement processes and include District and khoroo offices, community organizations and the media.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### **MONITORING**

MCA-Mongolia or its representative's SST:

- Monitor Contractor Gender Integration and Social Inclusion Plan
- Monitor Contractor employment recruitment strategies and assist Contractor to reach potential women, youth and other excluded groups
- Monitor participation by all parties in the Contractor's internal and external project Grievance Redress Mechanisms
- Document Contractor performance in Gender Integration and Social Inclusion Plan

Contractor:

- Record results of Contractor's Gender Integration and Social Inclusion responsibilities
- Document all grievance redress activities under the Contractor's internal grievance process and external Grievance Redress Mechanism

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

#### INDICATORS AND SUCCESS CRITERIA:

Indicators:

- Employment recruitment activities
- Employment records of workers

<ul style="list-style-type: none"> <li>• Number, dates, and locations of community engagement meetings</li> <li>• Community related grievance redress actions and outcomes</li> <li>• Number of purchase orders signed each year with UB businesses disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Total annual dollar amount of procurements from UB, disaggregated by those in Khan-Uul and Songinokhairkhan Districts and those in the rest of UB, indicated as a number and as percent of the total number of purchase orders signed</li> <li>• Number, percentage, and dollar amount of purchase orders signed with women-owned businesses each year against the total number and dollar amount of purchase orders.</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• 100% of required community meetings are held, with all topics covered</li> <li>• Maximization of local labor, such that percentage of all labor exceeds a minimum target percentage to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>• Achievement of 30% employment of women as a percentage of all staff, in each skill/occupational category</li> <li>• Employment of young people and "vulnerable" groups at a target to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST)</li> <li>• Apprenticeships and internships established and completed for each construction season</li> <li>• Contractor enters into and maintains an agreement with at least one TVET center and employs TVET graduates at a target to be determined between the Contractor and MCA-Mongolia</li> <li>• Contracts and purchase orders with local business and service providers, including women-owned businesses and service providers, reach targets to be determined between the Contractor and MCA-Mongolia or its representative's Social Safeguards Team (SST) <ul style="list-style-type: none"> <li>○ Targets to be expressed as a number, as a percentage of all contracts and purchase orders, and as a dollar amount (USD)</li> <li>○ Targets to be set for all locally owned business, for businesses in the two project-affected districts, and for women-owned businesses</li> </ul> </li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on Gender Integration and Social Inclusion to be included in project monthly reports</li> <li>• Summarize Gender Integration and Social Inclusion activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Update recording of GSI activities and grievance redress actions as they occur</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in CESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> Engineer</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> MCA-Mongolia or its representative's Social Safeguards Team and Contractor</p> <p><i>Oversight:</i> Engineer</p>

## Management Measure Conveyance -11: Counter-Trafficking in Persons, Gender-Based Violence and Sexual Harassment

POTENTIAL IMPACT
<p>Adverse impacts to be avoided or minimized:</p> <ul style="list-style-type: none"> <li>• Sexual harassment on construction sites and in temporary construction facilities and project-affected communities</li> <li>• Trafficking in persons within and outside the project</li> <li>• Gender-based violence on construction sites and in temporary construction facilities and project-affected communities</li> </ul>
STANDARD(S) / REQUIREMENT(S) TRIGGERED:
<p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• MCC Counter-Trafficking in Persons Policy (C-TIP Policy) <ul style="list-style-type: none"> <li>○ States, "Trafficking in Persons" means (a) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; (b) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."</li> <li>○ Adopts "a zero-tolerance policy to TIP and prohibits "The Contractor, the Contractor's Personnel, any Subcontractor or supplier, or any of their respective personnel, or any agent or affiliate of any of the forgoing shall not engage in any form of Trafficking in Persons during the period of performance of any contract..."</li> <li>○ Requires each Contractor to "acknowledge that engaging in such activities is cause for suspension or termination of employment or of the Contract" and specifies remedies that the MCA Entity will apply once a TIP incident has been confirmed.</li> </ul> </li> <li>• Mongolian Law on Promotion of Gender Equality <ul style="list-style-type: none"> <li>○ Requires the employer to incorporate into the organization's internal procedures, specific norms for prevention of sexual harassment in a workplace and the redress of such complaints. It also requires that the organization design and conduct a program of training and retraining geared toward creating a working environment free from sexual harassment, and report on its impact in a transparent manner.</li> </ul> </li> <li>• Mongolian Law to Combat Human Trafficking <ul style="list-style-type: none"> <li>○ The law regulates relations with respect to the prevention and suppression of trafficking in persons, elimination of the causes of trafficking, and protection of victims' rights.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• To prevent incidence of trafficking of persons for sex by project employees</li> <li>• To ensure that the Contractor and its Sub-Contractors do not employ trafficked labor and to minimize the risks of trafficking of foreign workers to project sites</li> <li>• To prevent sexual harassment at all construction sites and temporary construction facilities</li> <li>• To prevent Contractor and worker involvement in sexual harassment in project-affected communities and among members of stakeholder organizations in the workplace</li> <li>• To prevent incidences of gender-based violence involving workers</li> </ul>
MANAGEMENT MEASURE
Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
<p>The Contractor shall ensure that foreign workers on work sites or in labor camps are aware 1) of the risks of cultural conflict and of becoming victims of gender-based violence, sexual harassment and abuse, discrimination, trafficking in persons and 2) the legal and contractual remedies against such</p>

behavior. This information shall be provided in workers' induction packages, by holding an orientation before workers start on site, and by delivering a training twice a year.

*Counter-Trafficking in Persons (C-TIP)*

- The Contractor shall prepare and submit for the Engineer's written approval a Counter-Trafficking in Persons Response Plan (TIP Response Plan), and the Contractor will perform the work in accordance with relevant sections of the ESMP. The Contractor will ensure all employees are informed of expectations of behavior as per the Worker Behavior Code of Conduct and the penalties for proven infringements..
  - The Counter-Trafficking in Persons Response Plan shall Address the specific TIP risks identified in the ESIA, including withholding of foreign workers' passports and commercial sex with minors,
  - Designate a single responsible person who will notify the Engineer and MCA-Mongolia within 24 hours of an alleged incident and implement any investigation.
  - Specify when to contact legal authorities, list UB city officials, national government offices, and NGO organizations that address TIP, and state how the Contractor will deal with them in the case of a TIP incident.
  - Include mechanisms to ensure confidentiality of any TIP survivors and to refer them to law enforcement and/or supportive services if they wish.
- The Contractor shall develop, as part of its TIP Response Plan, an anonymous mechanism for workers and community members to report suspected TIP incidents to the Engineer and to MCA-Mongolia, and this must be separate from the project grievance mechanism.
- The Counter-Trafficking in Persons Response Plan shall be:
  - Consistent with the Mongolian Law on Labor, Promotion of Gender Equality, and combatting Human Trafficking
  - Compliant with the MCC Counter-Trafficking in Persons Policy
  - Coordinated and agreed with the MCA-Mongolia or its representative's Social Safeguards Team and operated by the Contractor's Social Safeguards Officer
- The Counter-Trafficking in Persons Response Plan shall specifically prohibit:
  - Procuring minors for sex
  - Transporting non-employee individuals in company vehicles
- The Contractor is strongly encouraged to engage the Centre for Gender Equality or other similarly qualified and experienced organization to develop its TIP Response Plan, its anonymous reporting mechanism, its worker training, and its C-TIP content for community meetings
- The Contractor shall design and deliver twice yearly C-TIP training modules to all staff, sub-contractors, and service providers on the prevention of TIP and the Contractor's TIP Response Plan, following minimum content in MCA-Mongolia's Social and Gender Integration Plan (SGIP).
  - C-TIP training sessions must be delivered to all employees within one month of starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Information about the Contractor's zero-tolerance policy and TIP Response Plan shall be included in all community meetings and the Plan shall be provided in Mongolian, in whole, to project-affected khoroo and District governments.

*Gender-Based Violence*

- The Contractor shall adopt a policy of zero-tolerance for gender-based violence and address any complaints of gender-based violence against its workers or committed by its workers as complaints of a potential crime, separately from the Grievance Redress Mechanism.
- The Contractor shall notify the Engineer and MCA-Mongolia within 24 hours of any alleged incident of gender-based violence
- The Contractor shall deliver a gender-based violence prevention training to all staff, sub-contractors, and service providers prior to all workers beginning on-site and thereafter at least twice each year.
  - The Contractor is strongly encouraged to engage a local, qualified, and experienced



- organization to develop the training.
  - The training shall minimally identify behavior that constitutes gender-based violence, address attitudes towards violence against women and lesbian, gay, bisexual, transgender, and queer people (LGBTQ), and identify relevant Mongolian laws and organizations addressing gender-based violence.
  - It shall also explain the workings and protections in the Contractor's grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ persons.
- Include in all community meetings information about the Contractor's zero-tolerance policy toward gender-based violence committed by or against its workers and procedures for reporting it and communicate this information in writing to project-affected khoroo and District governments.

#### *Sexual Harassment*

- The Contractor shall develop and submit to the Engineer an Anti-Sexual Harassment Policy prohibiting sexual harassment directed at Compact beneficiaries, partners, or stakeholders, MCA Entity employees, MCA Entity consultants, MCC personnel, or MCC consultants and including an Incident Reporting and Referral Plan.
  - The Policy and Plan must be in form and substance satisfactory to the MCA and MCC.
  - The Incident Reporting and Referral Plan shall include a confidential mechanism for workers and community members to report sexual harassment to the Engineer and to MCA-Mongolia, separately from the Grievance Redress Mechanism.
- Employers are required to have a protocol in their Workplace Grievance mechanism in which persons alleging harassment or violence will be protected from identification and from pressure from the Contractor or other workers to dismiss the complaint.
- The Contractor's grievance manager must notify the MCA-Mongolia or its representative's Social Safeguards Team and the Contractor's Social Safeguards Officer within 24 hours of any allegation of sexual harassment.
- The Contractor must have a contract with a suitably experienced organization, such as the Centre for Gender Equality, to provide an investigation leader to manage the investigation of complaints of sexual harassment.
- The MCA Entity may investigate (either directly or through a third party) allegations of sexual harassment as it determines appropriate. The Contractor shall fully cooperate with any investigation conducted by the MCA Entity regarding breach of this provision. The Contractor will ensure that any incident of sexual harassment investigated by the MCA Entity has been resolved to the MCA Entity and MCC's satisfaction.
- The Contractor shall design and deliver a sexual harassment prevention training to all staff, sub-contractors, and service providers, in accordance with the Contractor's Anti-Sexual Harassment Policy, recognizing MCC's Guidance to MCAs on Sexual Harassment.
  - Training shall be conducted within one month of workers starting work on site, and twice a year while employed. The training must be reinforced during toolbox talks each month.
  - Training shall address
    - Attitudes to and prevention of sexual harassment in the workplace
    - Workings and protections in the Contractor's internal grievance mechanism when dealing with allegations of harassment, abuse or violence towards women and LGBTQ+ persons
    - Additional requirements for minimum training content can be found in MCA-Mongolia's Social and Gender Integration Plan (SGIP)
- Information about the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral plan shall be included in all community meetings and the Policy and Plan shall be communicated in Mongolian, in whole, to project-affected khoroo and District governments.

#### LOCATIONS:

All construction sites and temporary construction facilities and project affected communities

MONITORING
<p>MCA-Mongolia or its representative's SST:</p> <ul style="list-style-type: none"> <li>• Monitor Contractor Counter-Trafficking in Persons Response Plan</li> <li>• Monitor Contractor performance related to gender-based violence requirements</li> <li>• Monitor Contractor's development and adherence to its Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Participate in the Contractor's internal Grievance Redress Mechanisms in relation to any on allegations of sexual harassment and gender-based violence and monitor and document the process and outcomes, maintaining confidentiality of those reporting and victims and witnesses</li> </ul> <p>Contractor:</p> <ul style="list-style-type: none"> <li>• Maintain copies of all contracts or other agreements with organizations that provide services related to the development of C-TIP, GBV prevention, or prevention of sexual harassment policy, plans, training, or reporting mechanisms</li> <li>• Maintain records of workers' participation in required trainings, including the dates of trainings and which workers participated</li> <li>• Maintain records of all community meetings at which C-TIP, gender-based violence, and sexual harassment are addressed, including the dates and locations and a record of all questions, comments, and Contractor responses</li> <li>• Document all implementation of the results of Contractor's Counter-Trafficking in Persons Response Plan responsibilities</li> <li>• Document all complaints of sexual harassment and gender-based violence, maintaining confidentiality of witnesses and victims, and all implementation of the Sexual Harassment Incident Reporting and Referral Plan and interactions with law enforcement and other relevant response institutions and organizations</li> <li>• Grievance redress activities under the Contractor's internal grievance process</li> </ul>
<p>LOCATIONS:</p>
<p>All construction sites and temporary construction facilities and project affected communities</p>
<p>INDICATORS AND SUCCESS CRITERIA:</p>
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Content of the Contractor's TIP Response Plan</li> <li>• Content of the Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan</li> <li>• Number and content of trainings for all staff</li> <li>• Number of community meetings at which information presented covers the Contractor's policies on C-TIP, GBV, and sexual harassment and how to report suspected cases compared to the total number of Contractor-organized community meetings, disaggregated by location</li> <li>• Numbers of complaints and grievances brought alleging sexual harassment, gender-based violence or trafficking in persons</li> <li>• Number of required notifications of suspected TIP, GBV, and sexual harassment incidents compared to the number of complaints</li> <li>• Contracts or other agreements with specialized organizations to develop and deliver plans, policies, and training</li> </ul> <p>Success Criteria:</p> <p><i>Counter-trafficking in persons</i></p> <ul style="list-style-type: none"> <li>• Anonymous reporting mechanism for trafficking in persons is established prior to initiation of construction and functioning effectively for the duration of the construction</li> <li>• The Contractor's TIP Response Plan is thorough, references the MCC C-TIP Policy and any guidance, provides a path to involve NGOs and specialized government staff, and includes</li> </ul>

<p>clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</p> <ul style="list-style-type: none"> <li>• 100% of reported or suspected cases of TIP are dealt with in a timely, survivor centered manner, according to the TIP Response Plan.</li> <li>• Effective reporting and management measures are developed are implemented and information about the measures are introduced to the employees and sub-contractors in toolbox sessions and by other means</li> <li>• 100% of community meetings include reference to the zero-tolerance policy against TIP and to the Contractor's TIP Response Plan</li> </ul> <p><i>Gender-based violence</i></p> <ul style="list-style-type: none"> <li>• Culture of unacceptability of gender-based violence and assaults on women and LGBTQ+ persons established via: <ul style="list-style-type: none"> <li>○ 100% of workers having participated in gender-based violence prevention training prior to beginning work on-site</li> <li>○ The Contractor notifying the Engineer and MCA-Mongolia within 24 hours of 100% of any alleged incident of gender-based violence</li> <li>○ Timely, confidential, and thorough dealing with complaints of gender-based violence and 100% implementation of zero-tolerance policy in confirmed cases</li> <li>○ 100% of community meetings including reference to the zero-tolerance policy against gender-based violence and procedures for reporting it</li> </ul> </li> </ul> <p><i>Sexual harassment</i></p> <ul style="list-style-type: none"> <li>• The Contractor's Anti-Sexual Harassment Policy and Incident Reporting and Referral Plan are thorough, reference the Contract, aspects of the MCC Guidance to MCAs on Sexual Harassment, and Mongolian Law; provide a path to involve NGOs and specialized government staff; and include clear procedures for various actors to follow. The Plan prioritizes survivors' wellbeing, confidentiality, and preferences for how to handle each case.</li> <li>• 100% of employees and sub-contractors have taken the sexual harassment prevention training prior to on-site work</li> <li>• All worker and community complaints about sexual harassment are <ul style="list-style-type: none"> <li>○ addressed confidentially</li> <li>○ addressed in a timely manner and</li> <li>○ resolved following the procedures in the Contractor's Sexual Harassment Incident Referral and Reporting plan</li> </ul> </li> <li>• After investigation, appropriate measures are taken against perpetrators of sexual harassment on the job site, in temporary facilities, and in surrounding communities</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Reports on measures to prevent and address counter-trafficking in persons, gender-based violence, and sexual harassment shall be included in project monthly reports</li> <li>• Summarize activities related to counter-trafficking in persons, gender-based violence, and sexual harassment undertaken during each reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern,</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p>	<p><b>MONITORING:</b></p>

<i>Implementation:</i> Contractor	<i>Implementation:</i> Contractor
<i>Oversight:</i> Engineer	<i>Oversight:</i> Engineer – MCA-Mongolia or its representative's Social Safeguards Team

## Management Measure Conveyance -12: Construction Camp and Temporary Facilities Management

POTENTIAL IMPACT
Risks and impacts that may be associated with workers' accommodation and workplace conditions
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Constitution of Mongolia <ul style="list-style-type: none"> <li>○ Employee possesses the right to work in favorable conditions, remuneration, rest and private enterprise.</li> </ul> </li> <li>• Mongolian Civil Code <ul style="list-style-type: none"> <li>○ Requires providing office space, tools and equipment necessary to ensure employees' health and meeting safety standards and work specific requirements.</li> </ul> </li> <li>• Mongolian Labor Code <ul style="list-style-type: none"> <li>○ Requires ensuring that chemical, physical and biological conditions resulting for production processes will not have a negative impact on safety, sanitation, or the natural environment.</li> </ul> </li> <li>• Mongolian Law on Labor Safety and Hygiene <ul style="list-style-type: none"> <li>○ Requires informing workplace conditions, risks that can impose danger to health, industrial dangerous and poisonous factors to its employees.</li> </ul> </li> <li>• Mongolian Law of Fire Safety <ul style="list-style-type: none"> <li>○ Requires inspecting availability of rooms for employees and requirements of hygiene, outcome of protection measures against negative impacts of working environments.</li> </ul> </li> <li>• Mongolian Supreme Court Interpretation of Some Provisions of Law on Labor, Supreme Court Decree No. 33 <ul style="list-style-type: none"> <li>○ Prohibits precluding to conclude a contract of legal entities and organizations.</li> </ul> </li> <li>• IFC Performance Standards 2 and 4 <ul style="list-style-type: none"> <li>○ Require identifying environmental and social risks and impacts that are in the context of the project's area of influence.</li> </ul> </li> <li>• Mongolian Law on Combating Human Trafficking <ul style="list-style-type: none"> <li>○ Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC and EBRD (2009) guidance at Workers' Accommodation: Processes and Standards<sup>1</sup> <ul style="list-style-type: none"> <li>○ Requires having a written management plan on worker camps and housing facilities.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>○ Provides specific guidance on prevention and control of community health and safety impacts that may occur during project construction and decommissioning.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside in the Contractor's construction camps or work in the Contractor's temporary facilities can do so in a safe, secure, clean, and hygienic environment, free from intimidation.</li> </ul>
MANAGEMENT MEASURE
<p><b>Construction Camp and Temporary Facilities Management</b></p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> </ul>

<ul style="list-style-type: none"> <li>• Ensure that all individuals who reside or work in, accommodated at, or visit construction camps and workplaces can do so in a safe, secure, clean, hygienic, respectful, and harmonious environment</li> <li>• Ensure compliance with IFC and EBRD (2009) guidance at <i>Workers' Accommodation: Processes and Standard</i> for accommodation; including clean and safe areas that ensure the minimum space requirements, air conditioning, heating, and ventilation that is appropriate for the local climatic conditions, gender-based accommodation facilities, etc.</li> <li>• Ensure compliance with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i> for on-site facilities; including canteen, sanitary facilities, adequate amenities for socialization and resting, etc.</li> <li>• Survey accommodation facilities to be provided off-site (if any) and ensure they also comply with IFC and EBRD guidance at <i>Workers' Accommodation: Processes and Standards</i></li> <li>• Ensure drinking and utility water to be supplied meet the requirements of the Mongolian National Drinking Water Standards and World Health Organization (WHO) Guidelines for Drinking Water Quality</li> <li>• Provide gender-segregated toilet and washing facilities at construction camps and all sites where women work</li> <li>• Provide all accommodation sites with sufficient supplies and services</li> <li>• Provide all accommodation sites with sufficient emergency response equipment such as first aid kits and fire-fighting equipment, and conduct periodic checks to ensure they are in working condition</li> <li>• Conduct visual checks on site to ensure proper housekeeping</li> <li>• Ensure suitable first aid equipment is kept on site, at various appropriate locations</li> <li>• Conduct periodic medical checks for personnel and provide vaccination and/or other mitigating measures when required</li> <li>• Establish adequate medical rooms at the construction camps, provide sufficient human resources, and keep suitable patient transport vehicle on site for medical emergencies</li> <li>• Provide training—information and awareness sessions, and job category-specific specialized training—to all employees and subcontractors, including those accommodated at construction camps, at the time of their induction and annually thereafter on: <ul style="list-style-type: none"> <li>○ Construction Camp and Temporary Facilities Management consistent with the requirements of this management measure and the site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>○ General waste management, housekeeping, first aid practices, and communicable diseases</li> </ul> </li> <li>• Prepare and submit for the Engineer's written approval a site-specific Construction Camp and Temporary Facilities Management Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>○ Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan</li> <li>○ Assigns roles and responsibilities for construction camp and temporary facilities management</li> </ul> </li> </ul>
LOCATIONS:
All areas within and immediately surrounding construction camps and other temporary facilities
<b>MONITORING</b>
Document: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training</li> <li>• Submission and approval of plan</li> </ul>
LOCATIONS:
All areas within and immediately surrounding construction camps and other temporary facilities
INDICATORS AND SUCCESS CRITERIA:
Indicators: <ul style="list-style-type: none"> <li>• Implementation of the above provisions</li> <li>• Training sessions</li> </ul>

<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Plan approval</li> <li>• Provision of a safe, secure, clean, and hygienic environment, free from intimidation</li> </ul>	
<p><b>REPORTING:</b></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Construction Camp and Temporary Facilities Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Training prior to starting any construction activities and annually thereafter</li> <li>• Implementation of above provisions throughout construction</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training</li> <li>• Document implementation of above provisions</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

<sup>1</sup> International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Workers' Accommodation: Processes and Standards; A Guidance Note by IFC and the EBRD.

### Management Measure Conveyance -13: Cultural Heritage Protection

<p><b>POTENTIAL IMPACT</b></p> <ul style="list-style-type: none"> <li>• Chance finds of and potential inadvertent excavation or damage of tangible cultural heritage</li> <li>• Disturbance of the cultural and sacred landscape and places of religious or spiritual significance</li> <li>• Loss of the continuity of spiritual, religious, and traditional activities</li> </ul>
<p><b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b></p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Protection of Cultural Heritage <ul style="list-style-type: none"> <li>○ If tangible cultural heritage is discovered during excavation, requires halting work and immediately notifying the <i>soum</i> and <i>duureg</i> [capital city municipal district] governors, police, and concerned authorities.</li> <li>○ Prohibits building infrastructure facilities in historical and cultural monuments and their activity zones, to engage in mining and agriculture. Governors of all levels have the duty to protection the intangible cultural heritage.</li> </ul> </li> <li>• IFC Performance Standard 8 <ul style="list-style-type: none"> <li>○ Prohibits removing, significantly altering, or damaging critical cultural heritage.</li> </ul> </li> </ul>



- Requires designing and implementing a chance find procedure when the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations.

## OBJECTIVES

- Protect tangible cultural heritage from inadvertent excavation or damage
- Enable and foster the continuity of spiritual, religious, and traditional activities in consideration of the unavoidable disturbance of the cultural and sacred landscape and places of religious or spiritual significance

## MANAGEMENT MEASURE

### Cultural Heritage Protection

#### Chance Find Procedure

As unknown features/objects could be encountered during works, in particular earthworks, a chance finds procedure will be in place to stop works in case of such findings, and require investigation by an archaeologist and involvement of relevant government entities.

Should any unexpected tangible cultural heritage be discovered:

- Cease all work in the immediate area and do not disturb the chance find further, including:
  - Establishing a 30-meter buffer around the chance find
  - Leaving buffer undisturbed until competent cultural heritage specialist assesses the site
  - Protecting the chance find area, for example with signs for prohibition of entry, barrier tape, etc.
- Work may continue at other locations providing there is a buffer zone between the chance find area and the construction area
- Immediately notify the Engineer and the concerned government agencies, specifically the:
  - Office of the governor of the capital city
  - Office of governor of the respective Khan-Uul District or Songinokhairkhan District
  - Local police
  - Institute of Archeology, Mongolian Academy of Sciences
  - Institute of History and Ethnography, Mongolian Academy of Sciences
- Provide the following information to the Engineer and government agencies:
  - Cultural heritage site type—description and photograph(s)
  - Location—description and GPS coordinates
  - Date, time, and details of find
  - Nature of work that led to exposure of or locating the find
- Coordinate with the Engineer and the concerned government agencies to consult a cultural heritage professional on site to assess the cultural heritage and recommend mitigation
- Follow instructions of the concerned government agencies and cultural heritage professional for the protection of the tangible cultural heritage
- Restart work only upon written direction from the Engineer

#### Cultural and Sacred Landscape and Places

- SST will conduct enhanced stakeholder engagement with religious and spiritual leaders to assess the intangible cultural impact of construction on cultural and sacred landscape and places.
- Contractor will coordinate with the SST Community Liaison Officers and the Engineer, and as directed by the Engineer accommodate the performance of periodic spiritual, religious, and traditional ceremonies and rituals on or adjacent to project sites. The ceremonies and rituals may be integrated with or, if independent, their scale may be similar to groundbreaking ceremonies.

#### Training

The effective protection of cultural heritage is based on an understanding of the key issues, appropriate assessment, and correct action to minimize possible damage or loss.

The Contractor will:

<ul style="list-style-type: none"> <li>• Prepare and submit for the Engineer's written approval a site-specific Cultural Heritage Training Plan and associated procedures that, as a minimum: <ul style="list-style-type: none"> <li>○ Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting in response to chance finds of tangible cultural heritage, in accordance with the requirements listed above</li> <li>○ Specifies how the Contractor will educate and train personnel on requirements, procedures, and reporting to enable and foster the continuity of spiritual, religious, and traditional activities</li> <li>○ Assigns roles and responsibilities for training</li> </ul> </li> <li>• Educate and train all Contractor personnel and provide enhanced training to key Contractor personnel—including on-site environmental staff, safety staff, construction engineers, and unit supervisors—in accordance with approved Cultural Heritage Training Plan.</li> </ul>
<p><b>LOCATIONS:</b></p> <ul style="list-style-type: none"> <li>• All work sites</li> <li>• Cultural and sacred landscape and places throughout project area, as all land and the landscape throughout Mongolia and the project area is sacred</li> </ul>
<p><b>MONITORING</b></p>
<p>Monitor throughout construction</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Construction work sites during excavation or other ground disturbance</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Communications SST Community Liaison Officers and Engineer</li> <li>• Written directions of Engineer</li> <li>• Actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>• Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Document submission and approval of training plan</li> <li>• Document training of personnel as specified in approved plan</li> </ul>
<p><b>LOCATIONS:</b></p> <ul style="list-style-type: none"> <li>• All work sites</li> </ul>
<p><b>INDICATORS AND SUCCESS CRITERIA:</b></p>
<p>Indicators:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Chance find of tangible cultural heritage</li> <li>• Excavation or damage of tangible cultural heritage</li> <li>• Cease work decision</li> <li>• Protection of chance find area and tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Submission of training plan</li> <li>• Date and location of training sessions, or as specified in approved plan</li> <li>• Personnel start date, training completion date, and initial construction field date, or as specified in approved plan</li> </ul> <p>Success criteria:</p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• No excavation or damage of tangible cultural heritage</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• No loss of continuity of spiritual, religious, and traditional activities due to inability to perform ceremonies and rituals</li> </ul>

<p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Training plan approval</li> <li>• All personnel trained prior to initial construction field date, or as specified in approved plan</li> </ul>	
<p><b>REPORTING:</b></p> <p><i>Chance Find Procedure</i></p> <ul style="list-style-type: none"> <li>• Report chance find and cease work decision</li> <li>• Report excavation or damage of tangible cultural heritage</li> <li>• Report actions to protect chance find area and tangible cultural heritage</li> <li>• Report direction to restart work</li> </ul> <p><i>Cultural and Sacred Landscape and Places</i></p> <ul style="list-style-type: none"> <li>• Report communications with SST Community Liaison Officers and Engineer</li> <li>• Report directions of Engineer</li> <li>• Report actions to accommodate spiritual, religious, and traditional ceremonies and rituals</li> <li>• Report on performance of spiritual, religious, and traditional ceremonies and rituals</li> </ul> <p><i>Training</i></p> <ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Cultural Heritage Training Plan</li> <li>• Report training sessions and personnel start, training, and field deployment date, or as specified in approved plan</li> </ul> <p><i>Management Measure</i></p> <ul style="list-style-type: none"> <li>• Summarize other activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<p><b>SCHEDULE</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i></p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> <li>• Continuous during excavation or other ground disturbance</li> </ul> <p>Cultural and Sacred Landscape and Places</p> <ul style="list-style-type: none"> <li>• As required, periodically throughout project construction</li> </ul> <p>Training</p> <ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> <li>• Personnel training in accordance with timing and frequency specified in approved plan; at minimum, once at beginning of each construction season</li> </ul>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i></p> <ul style="list-style-type: none"> <li>• Document chance finds, cease work decisions, excavation or damage of tangible cultural heritage, communications, and written direction of Engineer to restart work as they occur</li> <li>• Document communications with SST Community Liaison Officers and the Engineer, and written directions of Engineer as they occur</li> <li>• Document communications and written approval of Engineer as they occur</li> <li>• Document training sessions and personnel start, training, and field deployment as they occur, or as specified in approved plan</li> </ul> <p><i>Reporting:</i></p> <ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<p><b>RESPONSIBILITY</b></p>	
<p><b>MANAGEMENT MEASURE:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>	<p><b>MONITORING:</b></p> <p><i>Implementation:</i> Contractor</p> <p><i>Reporting:</i> Contractor</p> <p><i>Oversight:</i> MCA-Mongolia or its representative</p>

## 3.5 Health and Safety Management

In addition to the management measure under this heading, the following management measures also specify health and safety management requirements:

- Management Measure Conveyance - 5: Emergency Preparedness and Response
- Management Measure Conveyance - 8: Waste Management
- Management Measure Conveyance - 12: Construction Camp and Temporary Facilities Management

### Management Measure Conveyance -14: Health and Safety Management

POTENTIAL IMPACT
Health and safety risks and impacts on work sites and in construction camps, and in the community
<p>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</p> <p>Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Mongolian Law on Hygiene <ul style="list-style-type: none"> <li>◦ Requires introducing labor safety and hygiene management for protecting employees from accidents, damages, diseases which could occur during the operation.</li> </ul> </li> <li>• Mongolian Law on Waste <ul style="list-style-type: none"> <li>◦ Requires providing relevant knowledge to their staff on waste sorting and comply with safety standards in their operation.</li> </ul> </li> <li>• IFC Performance Standard 4 <ul style="list-style-type: none"> <li>◦ Requires evaluating the risks and impacts to the health and safety of the affected communities during the project life cycle and establishing preventive and control measures consistent with good international industry practice.</li> <li>◦ Requires avoiding or minimizing transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.</li> </ul> </li> <li>• IFC Environmental, Health, and Safety (EHS) Guidelines: Construction and Decommissioning <ul style="list-style-type: none"> <li>◦ Provides guidance on occupational health and safety and community health and safety.</li> </ul> </li> </ul>
OBJECTIVES
<ul style="list-style-type: none"> <li>• Identify, assess, manage, and record and communicate all health and safety hazards, and ensure: <ul style="list-style-type: none"> <li>◦ Resulting risks to people, property, assets, and the environment are evaluated</li> <li>◦ Risks are managed in accordance with the recommended hierarchy of controls to achieve levels that are as low as reasonably practical</li> <li>◦ Any requirements to mitigate risks are implemented</li> <li>◦ Risks and actions to manage them are reported and communicated</li> </ul> </li> </ul>
MANAGEMENT MEASURE
<p><b>Health and Safety Management</b></p> <p>The Contractor will ensure, as far as practicable, that the health, safety, and welfare of employees and all other persons on site are secured and are protected from hazards created by the project.</p> <p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Fully comply with the requirements of this management measure</li> <li>• Comply with the IFC Environmental, Health, and Safety Guidelines<sup>1</sup></li> <li>• Comply with the health and safety requirements in Contract Documents Section V, Works Requirements, including but not limited to: <ul style="list-style-type: none"> <li>◦ Section 01030 Special Requirements, Paragraph 1.04.C Health and Safety Plan</li> </ul> </li> </ul>

- Section 01046 Control of Work, Paragraph 3.05 Open Excavations
- Section 01046 Control of Work, Paragraph 3.07 Interference with and Protection of Streets
- Section 01063 Miscellaneous Requirements, Paragraph 1.03 Traffic Control
- Protect drinking water sources, whether public or private, at all times
- Prepare and implement a traffic control plan for accessing the site, approved by Engineer
- Implement all reasonable precautions to protect the health and safety of workers
- Avoid or minimize the occurrence and transmission of communicable diseases, including surveillance, and active screening and treatment of workers
- Avoid or minimize potential hazards posed to project personnel and the public while accessing project facilities
- Undertake hazard analysis to identify opportunities to reduce the consequences of a failure or accident
- Control access to operational areas through physical barriers and demarcation, regular patrols of controlled areas, and engagement with communities
- Avoid or minimize traffic accidents and promote traffic safety by all project personnel
- Comply with local laws and international requirements applicable to the transportation of hazardous materials, and establish procedures for preventing or minimizing the consequences of releases of hazardous materials
- Inform and regularly update affected communities, including herders and vulnerable groups, and government agencies about potential project hazards and changes to project activities that may have environmental, health, or safety impacts, as well as the proposed prevention, mitigation, and emergency response measures
- Ensure that health, safety, and rescue matters are given a high degree of publicity to all persons regularly or occasionally on the project sites, as stipulated by Mongolia laws on occupational safety and health, by prominently displaying posters drawing attention to the relevant regulations in areas where Contractor and subcontractor personnel, Engineer's staff, MCA-Mongolia or its representative's staff, and site visitors will take notice
- Provide Health and Safety Management training—information and awareness sessions, and job category-specific specialized training—consistent with the requirements of this management measure and the site-specific Health and Safety Management Plan, to all employees and subcontractors at the time of their induction and annually thereafter

The Contractor will prepare and submit for the Engineer's written approval a site-specific Health and Safety Management Plan and associated procedures that, as a minimum:

- Affirms and executes the Contractor's comprehensive commitment to the standards and requirements listed above and specified in the plan
- Adhere to the MCC Health and Safety Policy (2012) and ensure the health and safety of all workers employed during the construction phase of the project
- Complies with applicable Government of Mongolia regulations and international good practice, where the more stringent will apply
- Specifies:
  - Site security, including securing of excavations, hazardous materials, etc.
  - Confined space safety procedures
  - Excavation and trenching safety measures
  - First aid facilities, equipment, and materials
  - Protective clothing and safety equipment
  - HIV/AIDS awareness program
  - Covid-19 awareness program
  - Counter-trafficking in persons program
  - Health and Safety management monitoring and reporting
- Assigns roles and responsibilities for health and safety management

#### LOCATIONS:

All project sites and surrounding communities

#### MONITORING

Document submission and approval of plan	
LOCATIONS:	
All project sites and surrounding communities	
INDICATORS AND SUCCESS CRITERIA:	
Indicators:	
<ul style="list-style-type: none"> <li>• Submission of plan</li> </ul>	
Success Criteria:	
<ul style="list-style-type: none"> <li>• Plan approval</li> </ul>	
REPORTING:	
<ul style="list-style-type: none"> <li>• Report communications and written approval of Engineer of site-specific Health and Safety Management Plan</li> <li>• Summarize activities undertaken during reporting period</li> <li>• Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>• Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i>	<i>Implementation:</i>
<ul style="list-style-type: none"> <li>• Plan preparation and submission, and written Engineer approval prior to starting any construction activities</li> </ul>	<ul style="list-style-type: none"> <li>• Document communications and written approval of Engineer as they occur</li> </ul>
	<i>Reporting:</i>
	<ul style="list-style-type: none"> <li>• Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
MANAGEMENT MEASURE:	MONITORING:
<i>Implementation:</i> Contractor	<i>Implementation:</i> Contractor
<i>Oversight:</i> MCA-Mongolia or its representative	<i>Reporting:</i> Contractor
	<i>Oversight:</i> MCA-Mongolia or its representative

<sup>1</sup> International Finance Corporation (IFC). Environmental, Health, and Safety Guidelines. Available at: <http://www.ifc.org/ehsguidelines>.

## 3.6 Education, Training, and Community Outreach

Incorporated in various management measures are requirements for education, training, and outreach. The overall goals of these requirements are to provide project employees with an understanding of the commitments included in those management measures and inherent in associated laws, regulations, and policies, and to provide the employees with an appreciation of their own accountability for maintaining mutually supportive relationships with local communities. All required training is to be provided as part of induction training (to provide general awareness) and job-specific training as necessary.

In addition to the management measure under this heading, the following management measures specify training requirements:

- Management Measure Conveyance - 5: Emergency Preparedness and Response
- Management Measure Conveyance - 7: Mongolian Marmot Protection and Habitat Restoration
- Management Measure Conveyance - 8: Waste Management
- Management Measure Conveyance - 9: Labor Management
- Management Measure Conveyance - 10: Gender Integration and Social Inclusion (GSI)



- Management Measure Conveyance - 11: Counter-Trafficking in Persons, Gender-Based Violence, and Sexual Harassment
- Management Measure Conveyance - 12: Construction Camp and Temporary Facilities Management
- Management Measure Conveyance - 13: Cultural Heritage Protection
- Management Measure Conveyance - 14: Health and Safety Management

Together, these management measures comprise the Education, Training, and Community Outreach Plan.

### **Management Measure Conveyance -15: Stakeholder Engagement, Community Consultation, and Grievance Redress**

<b>POTENTIAL IMPACT</b>
Delays, increased grievances, political interference, and unnecessary pressure from uninformed groups resulting from lack of information and discussion/consultation
<b>STANDARD(S) / REQUIREMENT(S) TRIGGERED:</b>
Standards and requirements that may be triggered by the potential impact include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• IFC Performance Standard 1 <ul style="list-style-type: none"> <li>○ Requires developing and implementing a stakeholder engagement plan that is scaled to the project risks and impacts and development stage, and tailored to the characteristics and interests of the affected communities</li> <li>○ Requires establishment of a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances about environmental and social performance, and scaled to the risks and adverse impacts of the project and with the affected communities as its primary user.</li> </ul> </li> </ul>
<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>• Inform and involve all stakeholders</li> <li>• Have in place a defined policy for dealing with external parties</li> <li>• Foster positive relations and effective partnerships with local communities throughout project construction and operation</li> <li>• Maximize the beneficial impact of the BWSE project on the affected communities</li> </ul>
<b>MANAGEMENT MEASURE</b>
<b>Stakeholder Engagement, Community Consultation, and Grievance Redress</b> The stakeholders and affected communities are to be informed of the construction activities, including implementation timeline and grievance redress procedure. <b>Stakeholder Engagement</b> <ul style="list-style-type: none"> <li>• The Contractor will: <ul style="list-style-type: none"> <li>➢ Maintain, revise, and update the Stakeholder Engagement Plan for the project consistent with the MCA-Mongolia Stakeholder Engagement Framework</li> <li>➢ Maintain, revise, and update the project Stakeholder Engagement Matrix</li> <li>➢ Document all stakeholder engagement activities in the Stakeholder Engagement Matrix</li> </ul> </li> </ul> <b>Community Consultation</b> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will <ul style="list-style-type: none"> <li>➢ Introduce Contractor's officers to communities</li> <li>➢ Monitor and supervise Contractor contacts with communities and other stakeholders</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>➤ Ensure that gender and social inclusion measures implemented by the Contractor are taken when planning meetings, and that thereby all sections of the community are equally informed and consulted</li> <li>• In coordination with the MCA-Mongolia or its representative, the Contractor will: <ul style="list-style-type: none"> <li>➤ Undertake community information dissemination, consultation, and outreach addressing the influx of migrant workers and the associated risks to the affected communities, the MCA-Mongolia Grievance Redress Mechanism, and other issues that arise during consultation</li> <li>➤ Document all community consultation activities in the Stakeholder Engagement Matrix</li> </ul> </li> </ul> <p><b>Grievance Redress</b></p> <ul style="list-style-type: none"> <li>• The MCA-Mongolia or its representative will supervise, and monitor participation by all parties <ul style="list-style-type: none"> <li>➤</li> </ul> </li> <li>• The Contractor will: <ul style="list-style-type: none"> <li>➤ Implement the Grievance Redress Mechanism consistent with Annex A</li> <li>➤ Designate the Contractor's staff for collaborating with the project Grievance Redress Mechanism</li> <li>➤ Document all grievance redress actions in the Stakeholder Engagement Matrix</li> <li>➤ Report on the Grievance Redress Mechanism to MCA-Mongolia and the Engineer</li> <li>➤</li> </ul> </li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
<b>MONITORING</b>
<p><b>MCA-Mongolia or its representative</b></p> <ul style="list-style-type: none"> <li>• Monitor Contractor contacts with stakeholders and communities</li> <li>• Monitor participation by all parties in Grievance Redress Mechanism</li> </ul> <p><b>Contractor</b></p> <ul style="list-style-type: none"> <li>• Document all stakeholder engagement activities</li> <li>• Document all community consultation activities</li> <li>• Record results of Contractor's community consultation activities</li> <li>• Document all grievance redress activities under the Grievance Redress Mechanism</li> </ul>
LOCATIONS:
All construction sites and temporary construction facilities
INDICATORS AND SUCCESS CRITERIA:
<p>Indicators:</p> <ul style="list-style-type: none"> <li>• Number, content, and outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> <li>○ Grievance redress actions</li> </ul> </li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>• Successful outcome of: <ul style="list-style-type: none"> <li>○ Stakeholder engagement activities</li> <li>○ Community consultation activities</li> </ul> </li> <li>• Resolution of grievances</li> </ul>
REPORTING:
<ul style="list-style-type: none"> <li>• Update project Stakeholder Engagement Matrix</li> <li>• Summarize other activities undertaken during reporting period</li> </ul>

<ul style="list-style-type: none"> <li>Specify any material deviations or non-compliances to this management measure, and any other issues of concern</li> <li>Define activities planned during next reporting period</li> </ul>	
<b>SCHEDULE</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Initiated during pre-construction prior to starting any construction activities and ongoing throughout pre-construction and construction</li> </ul>	<b>MONITORING:</b>  <i>Implementation:</i> <ul style="list-style-type: none"> <li>Update project Stakeholder Engagement Matrix as stakeholder engagement and community consultation activities, and grievance redress actions occur</li> </ul> <i>Reporting:</i> <ul style="list-style-type: none"> <li>Monthly in ESMP update</li> </ul>
<b>RESPONSIBILITY</b>	
<b>MANAGEMENT MEASURE:</b>  <i>Implementation:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative	<b>MONITORING:</b>  <i>Implementation:</i> Contractor <i>Reporting:</i> Contractor <i>Oversight:</i> MCA-Mongolia or its representative

### 3.7 Risk Control and Emergency Response

The Risk Control and Emergency Response Plan references procedures specified in the management measures in the preceding plans that are pertinent to 1) controlling risks and 2) responding to emergencies. Such risks and emergencies include, for example, fuel spills and encountering previously unidentified cultural heritage resources, as well as incidents involving sexual harassment, human trafficking, and gender-based violence.

Due to the broad scope of the Risk Control and Emergency Response Plan, effectively the plan incorporates by reference the procedures specified in the management measures in all preceding plans for this project phase.

### 3.8 Monitoring and Verification, and Maintenance Actions

This Monitoring and Verification, and Maintenance Actions Plan scopes the use of an adaptive approach to:

9. Verify that the management measures in the preceding plans are implemented, and that they are effective and sufficient
10. Revise those management measures that prove ineffective or insufficient

This approach acknowledges the risk and uncertainty of environmental and social management and fosters targeted modification of management measures to correct performance and outcomes. It will be executed as a continuous, iterative process by which the consequences of all management actions are systematically evaluated and, as needed, specific measures are modified in response to a determination that their forecasted outcomes will not meet requirements.

In the preceding plans, indicators and success criteria are designated for each management measure. For each management measure, MCA-Mongolia or its representative, in its oversight capacity, will determine whether progress toward the designated success criteria is sufficient and will document its determination in its regular updates and progress reports to MCA-Mongolia. If progress decidedly fails to meet iterative requirements, MCA-Mongolia or its representative will

inform the Contractor of the need to formulate a management measure-specific adaptive maintenance action to implement midcourse corrections. In coordination with the Contractor, MCA-Mongolia or its representative will reformulate the management measure to foster meeting the success criteria, incorporating as applicable operational or structural changes, and considering the cost effectiveness of incorporating the changes. The scope of most management measures likely will remain fairly stable; whereas, it is expected that some methods will be added, modified, or dropped over the implementation timeline of some management measures.

With the prior approval of MCA-Mongolia, the Contractor will implement and monitor the revised management measure, and MCA-Mongolia or its representative will provide oversight.

## **4 Implementation Work Plan and Schedule**

The majority of the management measures in the preceding pre-construction phase and construction phase plans require that the Contractor prepare and submit for the Engineer's written approval plans that detail the Contractor's commitment and approach to fulfilling the requirements of the management measure. Therefore, an implementation work plan and schedule cannot be specified in this ESMP.

The Contractor is required to incorporate in the Contractor's ESMP a detailed Contract Work Plan and Schedule to facilitate implementing the Contractor's ESMP as an integral component of executing and supervising the construction work.

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## Annex A – Grievance Resolution Mechanism

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The Contractor shall develop and implement a grievance redress mechanism that shall be applied in the case of a complaint or grievance that is related to or results from implementation of the project activities. A well-implemented grievance redress management system shall demonstrate that the project is concerned about community members and their well-being, building trust, respect, and productive relationships. As with the broader process of stakeholder engagement, it is important that management stays informed and involved in the management of grievances so that decisive action can be taken when needed to avoid escalation of disputes.

Under the GRM all persons shall be clearly entitled to make a complaint by any means – personal contact, office visit, telephone, letter, email, website enquiry, and directly to MCA-Mongolia or its representative. There should be a dedicated free call line for complaints. The GRM must make it easy to make a complaint and for that to be addressed easily and speedily. The system shall require that any member of any company associated with the project is aware of the requirement that they must receive and transfer on any complaint submitted to them in whatever form to their Grievance Officer who then follows the protocol for resolution.

All project partners shall accept the GRM process, agree to participate, train all contractor personnel to use the protocols to report grievances, participate in grievance resolution and reporting. The requirement to collaborate with the GRM will be mandated in construction contracts which will also require the designation of a responsible officer, usually the Contractor's Social Safeguards Officer.

The project grievance redress mechanism shall compliment traditional local-level mechanisms<sup>96</sup> for complaint resolution and legal administrative approaches to complaint resolution at all levels. It shall also document complaints or grievances from the public or other stakeholders (external communications with affected communities), and how these are resolved.

The grievance redress mechanism is intended to assist in resolving grievances or complaints raised regarding environmental and/or social issues arising from the projects/investments, and does not apply to the following complaints even if they are related to project activities:

5. Procurement and contractual complaints between MCA-Mongolia and its vendors or contractors which are normally handled by the MCA-Mongolia General Counsel Office,
6. Lawsuits which fall under the mandate of the General Counsel.

The Grievance Redress Mechanism (GRM) shall be compliant with the requirements of the IFC Performance Standard 5 (2012) and the MCC RPF for Western Wellfields (2018)<sup>97</sup>, and considers MUB GRM good practices that have been implemented for development projects in Ulaanbaatar city.<sup>98</sup> References available upon request to MCA.

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<sup>96</sup> The GSI Director will carefully consider the extent to which traditional mechanisms to resolve conflict are used, to ensure that these are not disadvantageous to women villagers, indigenous peoples, or other disadvantaged groups. A thorough assessment should be conducted to ensure that certain non-formal justice mechanism will assist women and other disadvantaged groups in accessing justice.

<sup>97</sup> Mongolia II Bulk Water Supply, Resettlement Policy Framework, Western Wellfields, MCC Feasibility Study, 2018

<sup>98</sup> Land Acquisition and Resettlement Plan for Selbe and Bayankhoshuu Subcenters: Heating Station, Kindergarten, Business Incubator and Training Center; UB Urban Services and Ger Areas Development Investment Program – Tranche 1, 2017

The MCA-Mongolia or its representative will supervise and monitor the GRM. The Contractor shall keep the Contractor shall have a grievance redress matrix that records every complaint and communication, the dates of each action and correspondence, how it is investigated and the outcome. The contracting company shall have an internal and external grievance policy and mechanism. The Contractor shall have a designated Grievance Officer to manage complaints according to the company policy. They must have a grievance policy for dealing with external complaints that is fully compliant with and integrated with their Engineer approved project GRM. The Contractor must also have an internal grievance management system.

MCA-Mongolia or its representative will monitor and supervise the contractors' Social Safeguards Officer. MCA oversight will be especially important when dealing with complaints related to sexual harassment, gender-based violence and sex trafficking complaints which require additional investigative expertise. MCA shall review, approve and be invited to attend training for contractors' personnel on roles and responsibilities for grievance management at both senior management levels and also to all members of the workforce. It is vital that all employees understand that they all can be receptors of grievances and they need to know how to deal with a complaint.

## 1.1 Complaint Resolution Procedure

The complaint resolution process shall be generally in accordance with the following. These complaint resolution procedures are compliant with Mongolian Law.

### Tier 1

- Step 1 – All contractors, staff, workers are responsible for receiving grievances and ensuring that the complainant is treated respectfully, and that the grievance is written down on the correct form and forwarded to the designated Grievance Officer in their organization.
- Step 2 - Receive and Register Complaint: The project designated person shall receive the completed complaint form, and he/she is responsible for documenting and recording the complaint in the log-in system/matrix for recording the grievance and processes to resolution. This person is also responsible for reporting as required to senior management on the grievances received and steps taken to resolve.
- Step 3 – Screening and Preliminary Assessment: An initial classification of the complaint will be conducted by the Grievance Officer who will assign the complaint to the relevant persons to resolve. The Grievance Officer is responsible for managing the response and reporting back to the project officer. The officer designated to resolve the issue is responsible for notifying the Grievance Manager or SST and sending information for inclusion in the project grievance matrix.
- Step 4 - Response to the Complaint: After consulting with the relevant personnel, the Grievance Officer contacts the complainant to acknowledge the complaint and provide information as to the expected steps and timeframe for resolution of the complaint. This communication is to be provided within 48 hours of receipt of complaint.
- Step 5 - Investigate and Resolve: This step investigates the complaint, including the underlying cause(s) of the complaint and develops actions needed to resolve the current issue and to prevent recurrence of a similar complaint. Resolution at local level can be a) rejecting the complaint with reasons or b) resolving the complaint and taking action to remedy as appropriate. The Designated Person reports the outcome to the Grievance Officer. Either way, the Grievance Designated Officer is responsible for communicating the decision to the complainant within **14 days** and to the Grievance Manager or SST for recording in the grievance matrix. The Designated Officer is responsible for implementing any works or payments or directives to subcontractors to remedy the source of the complaint, track it and document in the company and MCA-Mongolia records.
- Step 6 - If a local and immediate Tier 1 solution is not appropriate, then the receiving officer has to escalate the complaint to the next tier of grievance resolution,
- Step 7 - If the complaint cannot be resolved then the receiving officer must revise the selection or implementation of approaches.
- Step 8 - Close-out: After implementing mitigating actions or resolving the issue, a letter describing the response and outcome is sent to the complainant, signed by a project head.
- Step 9 - Follow-up: Based on the complainant satisfaction level, the response shall be archived or transferred for further investigation.



If resolution cannot be achieved the process is escalated to Tier 2.

**Tier 2:** If the complaint cannot be solved in Tier 1, the Designated Officer will assess the eligibility of the complaint and address to relevant divisions/offices of the district and its resolution is recommended to the district Governor for approval and resolved within 30 days. The Designated Officer will record its deliberations and inform the concerned parties orally or by telephone and in writing, as appropriate. If the solution is agreed by the complainant, the contractor or implementing entities will implement the solution. Written records will be made of all stages and outcomes.

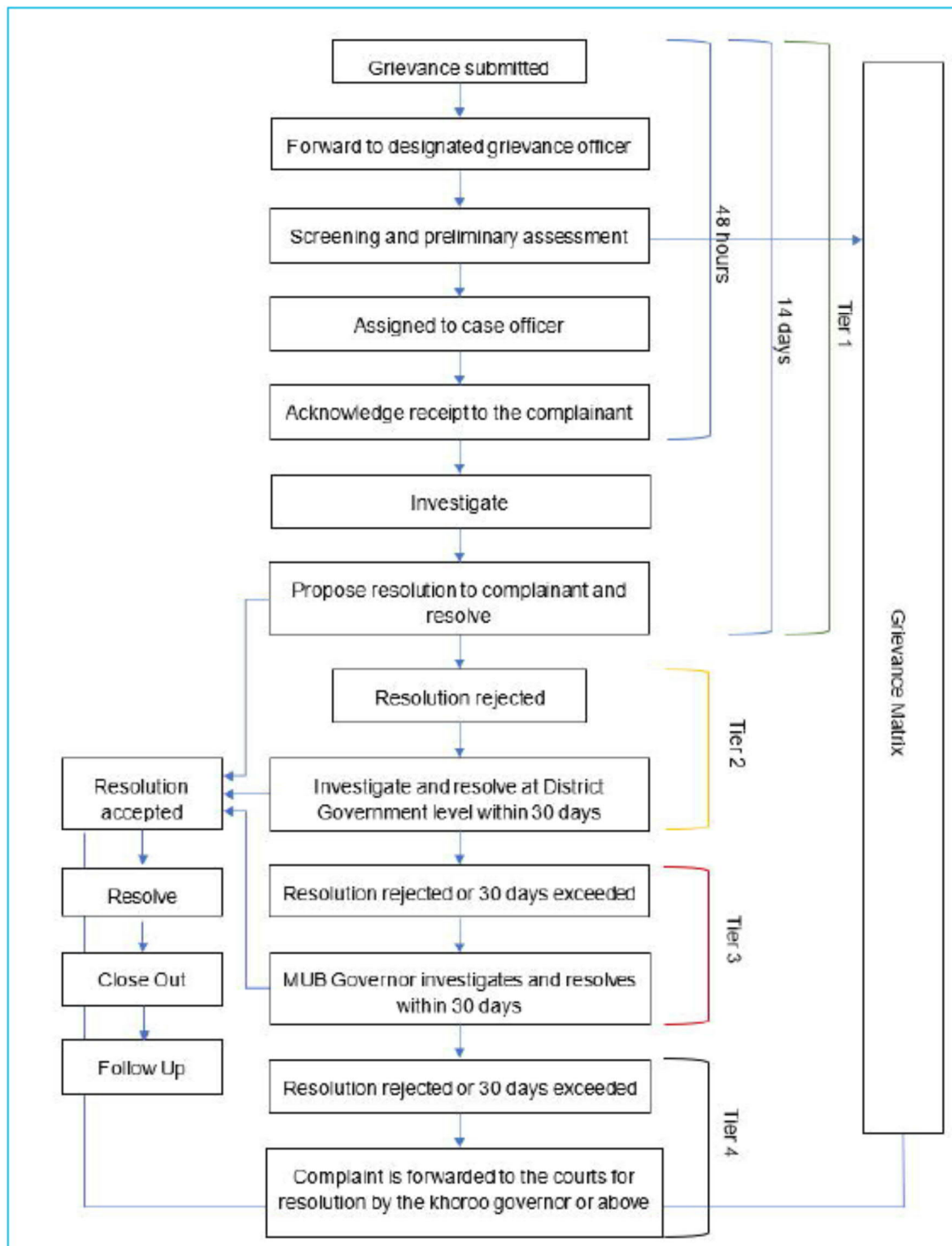
During this second review process either another formal written response will be provided to the grievant in **30 days** or it may be decided to hold a meeting with contractor representatives and the grievant. If complaint is ineligible (i.e., not a project related impact), it will be recorded and passed to the relevant authorities and the complainant will be informed of the decision and reasons for rejection within 30 days according to the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials.

**Tier 3:** If the grievance is not resolved within 30 days from its lodging at Tier 2 and/or the complainant is not satisfied with the recommended solution, the grievance will be submitted to the related divisions/offices of the MUB and its resolution is recommended to the MUB Governor for approval and action within 30 more days. If necessary, the MUB Governor will organize stakeholder meetings and/or Working Group meetings. A solution acceptable to all shall be identified including clear steps. The contractors and implementing entities will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

**Tier 4:** Failing resolution at Tier 3, the complainant has recourse to the Courts which should be regarded only as a last resort. With specific regard to land disputes, in accordance with the Law on Land (Article 60, "Settlement of Land Related Disputes"), these will be settled by the relevant khoroo governor. Where this is unsuccessful, the dispute shall be settled by a higher-level authority, or in court. Alternatively, residents may also go directly to the District Land Officer.

This system is depicted in the following figure.

## Flow Chart of the GRM



## 1.2 Approaches to Locally Based Grievance Resolution

The following approaches are required for grievance resolution:

- Dissemination of information to communities on how to make a complaint
- Dissemination of information on the GRM and how to make a complaint is made to all contractors and employees so that they understand their role in receiving and transmitting on all complaints. Ensure that all employees can assist complainants to fill in forms.
- Ensure all project partners offices have complaint forms available at reception areas and instructions on the process. Ensure that visitors can approach the Grievance Officer directly.
- Include information on grievances in information bulletins and community meetings so as to maintain trust in the process.
- Use a grievance log to monitor cases and improve the organization. In addition to resolving individual or community disputes, the grievance mechanism is an opportunity to promote improvements in the project and trigger policy and practice changes
- Evaluate and improve the system. The MCA-Mongolia or its representative shall be allowed to periodically conduct an assessment of the GRM to evaluate and improve its effectiveness and the Contractor shall comply with the outcomes and recommendations of those reviews. The evaluation will include: general awareness of the mechanism; whether it is used and by whom; the types of issues addressed; the ability of the mechanism to resolve conflicts early and constructively; the actual outcomes (impacts on project operations, management systems, and benefits for communities); its efficiency; and, most fundamentally, the ability to accomplish its stated purpose and goals. The MCA-Mongolia will solicit and include the views of stakeholder representatives to see how the mechanism is proving effective in practice.

## 1.3 The Grievance Form

The Grievance Form (GF) developed by the Contractor will at minimum contain the following:

- Basic information about the affected entity (name, address, contact number)
- Category of grievance filed (legal, technical/engineering, social, financial)
- Detailed description of grievance including time, date of incident and of recording, location etc.
- Type of action(s) taken (resolved at the local level or referred to higher authorities)

As a grievance is addressed, the type of action(s) taken will also be recorded on the GF, in order to document how the grievance was resolved.

The complainant enjoys the right to use the Governmental grievance redress procedures in accordance with the Law on Handling Grievances of Citizens Addressed to Government Authority and Government Officials. This governs grievance and complaints of citizens regarding the decisions and conduct of government authority or officials, and access to the judicial system, i.e., go to the courts, at any time, if they feel their grievance or concern is not being adequately addressed through the project GRM.

## 1.4 Grievance Mechanisms for Contractor's Internal Process

Each contractor is required to have an internal grievance policy and process for employees to raise issues about conditions of contact and behavior. The usual process is run by the human resources officers with the support of the Social Safeguards Officer. However, the treatment of allegations of sexual harassment, of gender-based violence and trafficking of persons needs external assistance to undertake effective investigation into allegations.

The Contractor must have an **anonymous** mechanism for reporting suspected TIP incidents that can be used by workers and communities. The Contractor has to develop a TIP response plan covering these issues: this TIP response plan will designate the SSO to manage the investigation including an external investigation lead from the Centre for Gender Equality, ensure a response within 24 hours and an effective resolution as soon as possible. This will also include contacting the legal authorities and qualified NGOs.

It is required that investigations into these issues are conducted with both a MCA Mongolia representative present and an external investigator drawn from a suitably qualified organization such as the Centre for Gender Equity who will chair the enquiry.

MCA Mongolia shall be able to work with the human resources department of the contractor to monitor contractor internal grievance mechanisms to ensure that allegations of sexual harassment, of gender-based violence and trafficking of persons are properly investigated with confidentiality protected and participate to ensure the investigation is properly undertaken. Appointing an independent but well-informed chair ensures effective investigation. Full documentation and recording is required.

Toolbox talks by the Contractor on anti-sexual harassment are required monthly. Contractors are required to mandate and enforce a policy refusing the transportation of non-project workers in company vehicles.

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# **Annex B – Public Consultation and Stakeholder Engagement Plan for BWSE**

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## **1.1 Introduction**

Good communication of the project with the public is vital for successful relations with all stakeholders and enhances the opportunities offered by successful projects. The risks associated with poor stakeholder relations are now better understood by all stakeholders. The concept of “stakeholder engagement” is emerging as a means of describing a broader, more inclusive, and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project. Increasingly, the recognition that reputational risks that come from poor stakeholder relations, place a growing emphasis on corporate social responsibility and transparency and reporting. In this context, good stakeholder relations are a prerequisite for good risk management. The focus of this SEP is on interactions with stakeholder groups “external” to the core operation of the project, such as affected communities, local government authorities, non-governmental and other civil society organizations, local institutions and other interested or affected parties.

Stakeholder engagement is an umbrella term encompassing a range of activities and interactions over the life of a project. Not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities as stakeholders come in all sorts of groupings, interests and formats. Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses. Interactions with all these groups require a SEP.

## **1.2 Stakeholder Engagement Plan**

This section describes the elements of the Stakeholder Engagement Plan to take forward the BWSE project.

The Stakeholder Engagement Plan covers nine components:

19. Staffing and resources
20. Stakeholder Identification and Analysis
21. Information Disclosure
22. Stakeholder Consultation
23. Partnerships
24. Grievance Management
25. Stakeholder Involvement in Project Monitoring
26. Reporting to Stakeholders
27. Management Functions

## **1.3 Staffing and Resources**

There are numerous stakeholder groups with potentially conflicting interests and influence in the project and these need careful and consistent management to gain and maintain a social licence to operate. Stakeholder Engagement for the BWSE requires substantial inputs of time to develop and to operate effectively. The most effective and integrated management location for the SEP team is under the MCA-Mongolia or its representative, under a trained and experienced Social Safeguards Specialist or Manager.

The SST requires a dedicated office with a small community meeting space, desks etc, filing capability, computer facilities, internet and telephones. The SST needs at least two Community Liaison Officers at field level to ensure good communication within affected communities.

The first task of the SST is to write an SEP with associated Standard Operating Procedures (SOPs) for each of the above sections to manage stakeholder interactions – this is to be regularly reviewed and updated.

## **1.4 Stakeholder Identification Analysis**

The ESIA process identified and consulted many potential stakeholders in the project. This work must be consolidated into a project wide stakeholder engagement matrix (SEM) listing each stakeholder, areas of interests and influence, contact person, contact details and add a line in the matrix for each meeting, consultation, email or telephone call etc. and the response made.

The SST must write an SOP for the management of the SEM.

The project is not static, stakeholders change interests, legislation and regulations change and institutional responsibilities mutate so that the stakeholder engagement process has to maintain and record and respond to stakeholders as they interact with the project and as they change over time. The SEP requires regular interaction with stakeholders to update and exchange information alongside the progression of the projects. To this end, the SEP is a live process, requiring regular monitoring and updating.

## **1.5 Information Disclosure**

The exchange of appropriate information with the right groups of people in an appropriate media and appropriate text and at the right time is fundamental to the success of the project. Information Disclosure must be planned and executed effectively to ensure project progress. The SST will have to plan in advance:

1. What information needs to be disseminated and when, broken down into individual messages by audience by project phase.
2. What language and wording is appropriate for each message and each audience. Will a translation be necessary?
3. Which media is suitable for each message and audience – meetings, letter, telephone call, radio broadcast, newspaper, social media etc.
4. Commission and maintain a project website to display information and enable communication from outside. This should enable complaints to be received and support the grievance redress mechanism. Members of the SST should have cards to hand out to enable people to know who they are and how to contact them.
5. Write an SOP to manage each message design and dissemination stating responsibilities and actions



6. Derive a budget for information dissemination activities over all project phases.

## **1.6 Stakeholder Consultation**

Information needs for the BWSE are not one way – not only do stakeholders need to receive project information but there needs to be a formal system of stakeholder consultation to enable external views to be heard and to enable discussion of project elements. This requires a system of consultations of stakeholders over the life of the project. The SST needs to examine the SEM and identify ways of regular consultation at appropriate intervals – some stakeholders need more frequent consultation than others at various times.

The SST needs to define a schedule of consultations, define suitable consultation intervals over the project life and draw up a calendar of consultations. These then need to be allocated to a consultation type, e.g. large physical meeting, small physical meeting, zoom/ skype call, allocated to where the meeting should/ could take place and allocate frequency, allowing for a margin of additional meetings in response to currently unknown circumstance. Resources and staffing can then be budgeted for consultations.

Regardless of the very small resettlement impacts under BWSE, special consideration needs to be made for families affected by landtake to ensure their interests are protected. The optimum consultation technique for this in BWSE, is the inclusion of two Community Liaison Officers in the SST (one per District) who will keep in contact with affected community members.

Consultation meetings need an organizer to make arrangements and distribute invitations to meetings, a meeting leader to lead the discussion and a recording assistant. It is best practice to make recordings of meetings and make a transcription as meeting notes. Copies of the meeting notes are distributed to meeting participants.

The SST needs an SOP on meeting protocol defining responsibility for arrangements, invitations, recording of meetings, distribution of minutes and integration into the SEM and data storage.

## **1.7 Partnerships**

Non-governmental organizations (NGOs) and community-based organizations (CBOs), particularly those who represent communities directly affected by a project, can be important stakeholders for companies to identify and engage on a proactive basis. NGOs may have expertise valuable to effective stakeholder engagement. For example, they can be sources of local knowledge, sounding boards for project design and mitigation, conduits for consulting with sensitive groups, and partners in planning, implementing and monitoring various project-related programs.

It is important to carry out initial research regarding the local power dynamics and existence of special interest groups to ensure that any intermediary organizations, such as NGOs, are truly representative of and accountable to the community interests they claim to support and represent. If there is NGO opposition to the project, engaging early to try and understand the concerns or critiques being raised can offer an opportunity to manage these issues before they escalate or find another outlet for expression.

Occasionally, projects require partnerships with other organizations in order to achieve some element. In BWSE, this may involve an NGO like Centre for Gender Equality, who may be needed to assist with training programs on gender and social inclusion, C-Tip training etc. and on assisting internal grievance procedures over cases alleging sexual harassment or gender based

violence within contractors. The SST needs to have an allocation in its budget for additional small levels of expenditure procuring additional partner services to meet the MCC Policies on Gender and Social Inclusion, C-TIP, HIV/ AIDS, etc. that need to be supplied externally from the MCA-Mongolia or its representative.

The SST must review potential partner organizations and explore possibilities for partnering with the MCA-Mongolia or its representative, and record communication in the SEP. An SOP on agreements and negotiations with third party partners is required.

## **1.8 Grievance Management**

The Grievance Redress Mechanism is discussed in detail in Annex A. It is vital that the mechanism is integrated into the SEP as it is the major channel of negative comment and complaint and needs effective management to resolve grievances and be reported to wider project management. Ideally, the responsibility for receiving and resolving grievances in BWSE would be of the MCA-Mongolia or its representative's SST. The SST needs sufficient staffing to manage community investigations and allegations of grievances.

The GRM requires a grievance matrix (GM) to record the incidence of each grievance and the process of investigation and response, The GM data must form part of the SST monthly reporting process.

## **1.9 Stakeholder Involvement in Project Monitoring**

One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social programs. Such participation, and the flow of information generated through this process, can also encourage local stakeholders to take a greater degree of responsibility for their environment and welfare in relation to the project, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholder.

Participatory monitoring goes beyond the project consulting with affected stakeholders on environmental and social monitoring data. It requires the physical presence of affected individuals at the time that monitoring takes place and involves data collection methods and indicators meaningful to the stakeholders concerned.

Participatory monitoring might include, for example:

9. Involvement of affected stakeholders in scientific sampling methods, questionnaires and analysis,
10. Observations by affected parties, triangulated to strengthen validation,
11. Group discussions on the success of mitigation or benefit measures and/or on how to manage new issues that have arisen
12. The adaptation of conventional participatory techniques to the purpose of assessing changes in the physical and socio-economic environment over time, such as a seasonal calendar, daily/weekly schedules, resource and land-use maps, and wealth ranking.

External monitoring of a company's environmental and social commitments can strengthen stakeholder engagement processes by increasing transparency and promoting trust between the project and its key stakeholders. Projects benefit by receiving an objective assessment of their environmental and social performance, which can help defuse external criticism and strengthen

support from local stakeholders. An external monitor can also help increase both the accountability of the project and the credibility of the monitoring results in the eyes of affected communities and civil society groups by serving as an independent and objective source of information and reporting. External monitors may be NGOs, government regulators, academics and scientists, community representatives, technical experts, or eminent persons.

Planning to include stakeholders in monitoring, whether internally or externally, need to be anticipated and included in the SEP and project monitoring plans. SOPs for managing these interactions are useful, particularly if they are drawn up in consultation of the stakeholder groups.

## **1.10 Reporting to Stakeholders**

Once consultations have taken place, stakeholders need to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, there are other types of reporting that target a different set of stakeholders. Sustainability reporting, for example, provides projects with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the project. It also offers a platform to report back on the process of stakeholder engagement itself, such as who has been consulted, on what topics, and with what results. Consequently, a number of international codes and standards for reporting now include requirements for implementing and reporting on stakeholder engagement, e.g. IFC Performance Standards.

Under this heading, the SST needs to:

13. Determine what information needs to be reported to which stakeholders, by what method and how frequently, add to the SEP budget lines.
  14. Regularly update the commitments register where promises have been made to stakeholders in response to complaints or external pressure
  15. and disclose progress to affected and interested parties. In particular, publicize any material changes to commitments or implementation actions that vary from publicly disclosed documents.
  16. Make monitoring results publicly available, especially reports of any external monitors.
  17. Regularly report on the process of stakeholder engagement as a whole, both to those stakeholders who are directly engaged, and to other interested parties.
  18. Derive an SOP for reporting to stakeholders.
- 53.

## **1.11 Management Functions**

Increasingly, good practice points to incorporating stakeholder engagement activities into a project's environmental and social management system. In practice this means making its management systematic by integrating it with core activities. To achieve this, the MCA-Mongolia or its representative will need to identify critical points in the life of the project where stakeholder engagement will be needed, and determine who will deliver these actions and how they can be integrated with core project functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement and reporting as discussed in the previous sections, including:

15. Ongoing stakeholder analysis and the assessment of stakeholder concerns from a “risk” perspective
16. The hiring and training of community liaison officers
17. Consultation processes designed to meet the Project’s own policies and/or compliance requirements of funders and regulators
18. Input and suggestions received from stakeholders on project design and proposed mitigation measures
19. Grievance mechanisms that capture and respond to stakeholder concerns
20. The involvement of local stakeholders in project monitoring
21. Reporting information to stakeholders.

Most importantly, stakeholder engagement should be managed as one would manage any other project function — with clearly defined objectives and targets, professional, dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Some good practice principles for managing stakeholder engagement processes are given below.

- Coordinate activities and assign overall responsibility: Over the life of the project, affected communities and other interested parties will likely interact with a variety of representatives from within the project and its contractors. It is essential that this diverse set of engagement activities be coordinated.
- Consistency of information: Consistency of information conveyed to stakeholders by different teams or business units within the MCA-Mongolia and its representative is important, as is keeping track of such activities in order to reduce inefficiencies, confusion, and conflicting messages or commitments. This is usually best achieved by giving a senior Social Manager overall responsibility for stakeholder engagement. This high-level oversight not only helps to underscore the importance of the function but is needed in order to effectively implement the strategy and coordinate the various activities across the project.
- Hire, train, and deploy the right personnel: Initial stakeholder analysis will provide a sense of the type of stakeholder groups the project will need to engage during different phases of the project cycle. Engaging different types of stakeholders requires different skills and staffing considerations. For example, engaging with local communities requires one or more field-based community liaison officers, whereas engagement with government officials or local, national, and international organizations will likely require different skill sets and more direct involvement of the senior Social Manager. The project should consider bringing in social advisors or other expert staff to help design and facilitate the process and assist with participatory methodologies and other specialized techniques. When hiring community liaison staff, consider people who will be able to develop and maintain good working relationships with the local communities. Since their job will involve listening and responding to local concerns and suggestions, qualities to look for include:
  - Good people and communication skills
  - A good understanding of the local language and community/cultural dynamics
  - Open-mindedness and respect for the views of others
  - A solution-oriented approach
  - A high integrity/degree of trustworthiness
  - A genuine commitment to the position and its goals

54.

- Create clear reporting lines between the community liaison function and senior management: In order to be effective, Community Liaison Officers need to have the authority to negotiate on behalf of the project. This requires a clear reporting structure and clarification as to which decisions they can take unilaterally, and which are to be passed on to higher levels within the MCA-Mongolia and its representative. Direct reporting lines also enable senior managers to control risks by being kept informed of this type of field-level information in a timely manner. The more likely it is that the concerns of local stakeholders might pose a risk or reputational issue for the project, the more important it is for Community Liaison Officers to have a direct channel to senior managers.
  
- Communicate the strategy internally: If stakeholder engagement is to be effectively integrated into day-to-day project operations, the concept needs to be “owned” by all staff. Every project unit needs to be aware of the strategy and understand why the company is committing time and resources to the SEP. Too often, stakeholder engagement programs are compartmentalized within the project and regarded as a “soft concept” that is the domain of a few community liaison staff. By clarifying the links between stakeholder engagement and environmental and social performance – as well as its potential to impact on reputation and project outcomes – stakeholder relations becomes a collective responsibility.

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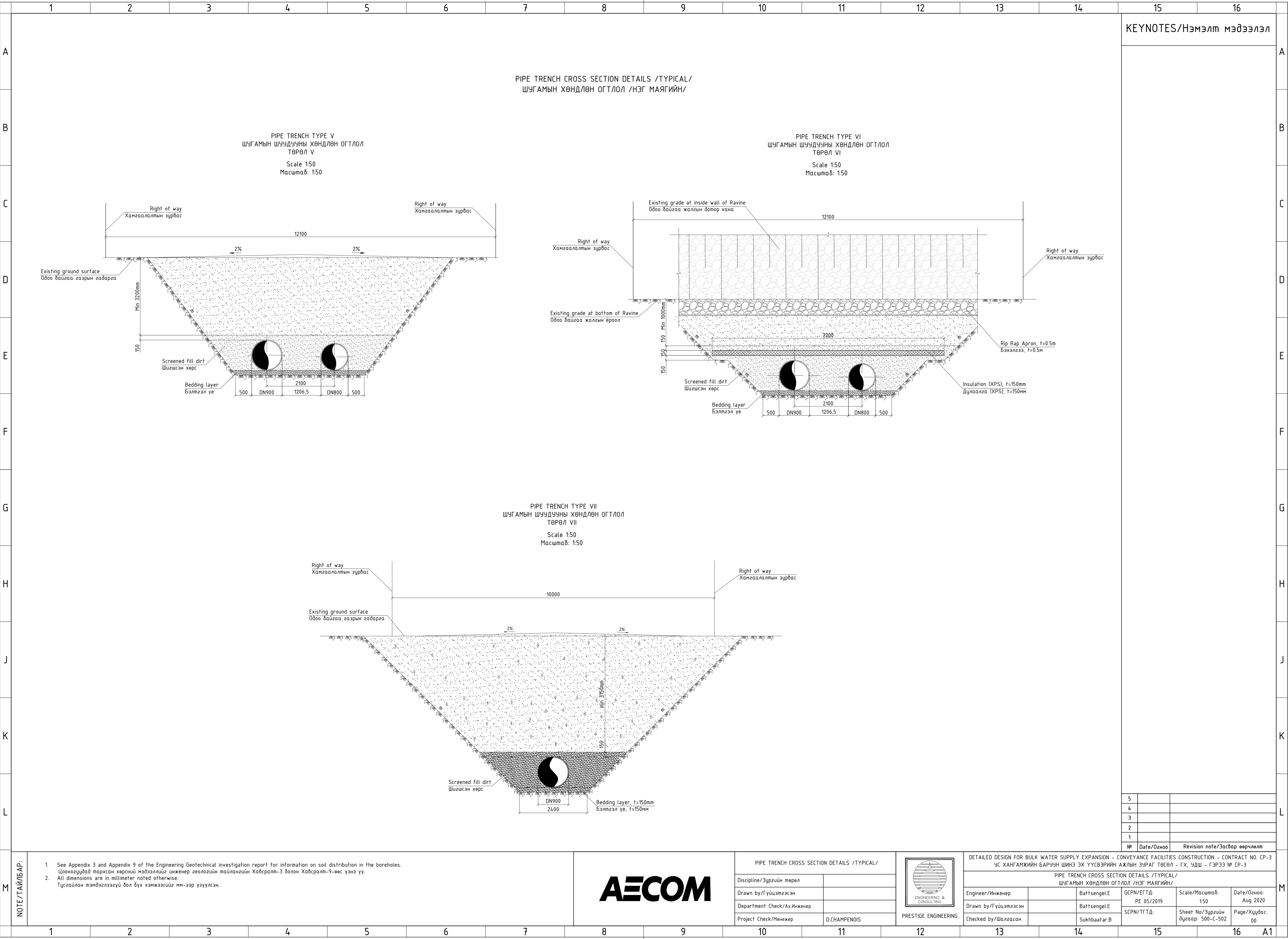
## Appendix K Typical Cross Sections

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KEYNOTES/Нэмэлт мэдээлэл

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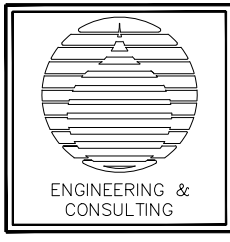
- NOTE/ТАЙЛАР:
1. See Appendix 3 and Appendix 9 of the Engineering Geotechnical investigation report for information on soil distribution in the boreholes.  
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2. All dimensions are in millimeter noted otherwise.  
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PIPE TRENCH CROSS SECTION DETAILS /TYPICAL/

Discipline/Зургийн төрөл	
Drawn by/Гүйцэтгэсэн	
Department Check/АхИнженер	
Project Check/Менеджер	D.CHAMPENOIS



PRESTIGE ENGINEERING

DETAILED DESIGN FOR BULK WATER SUPPLY EXPANSION - CONVEYANCE FACILITIES CONSTRUCTION - CONTRACT NO. CP-3  
УС ХАНГАМЖИЙН БАРУУН ШИНЭ ЭХ ҮҮСВЭРИЙН АЖЛЫН ЗУРАГ ТӨСӨЛ - ГХ, ҮДШ - ГЭРЭЭ № CP-3

PIPE TRENCH CROSS SECTION DETAILS /TYPICAL/  
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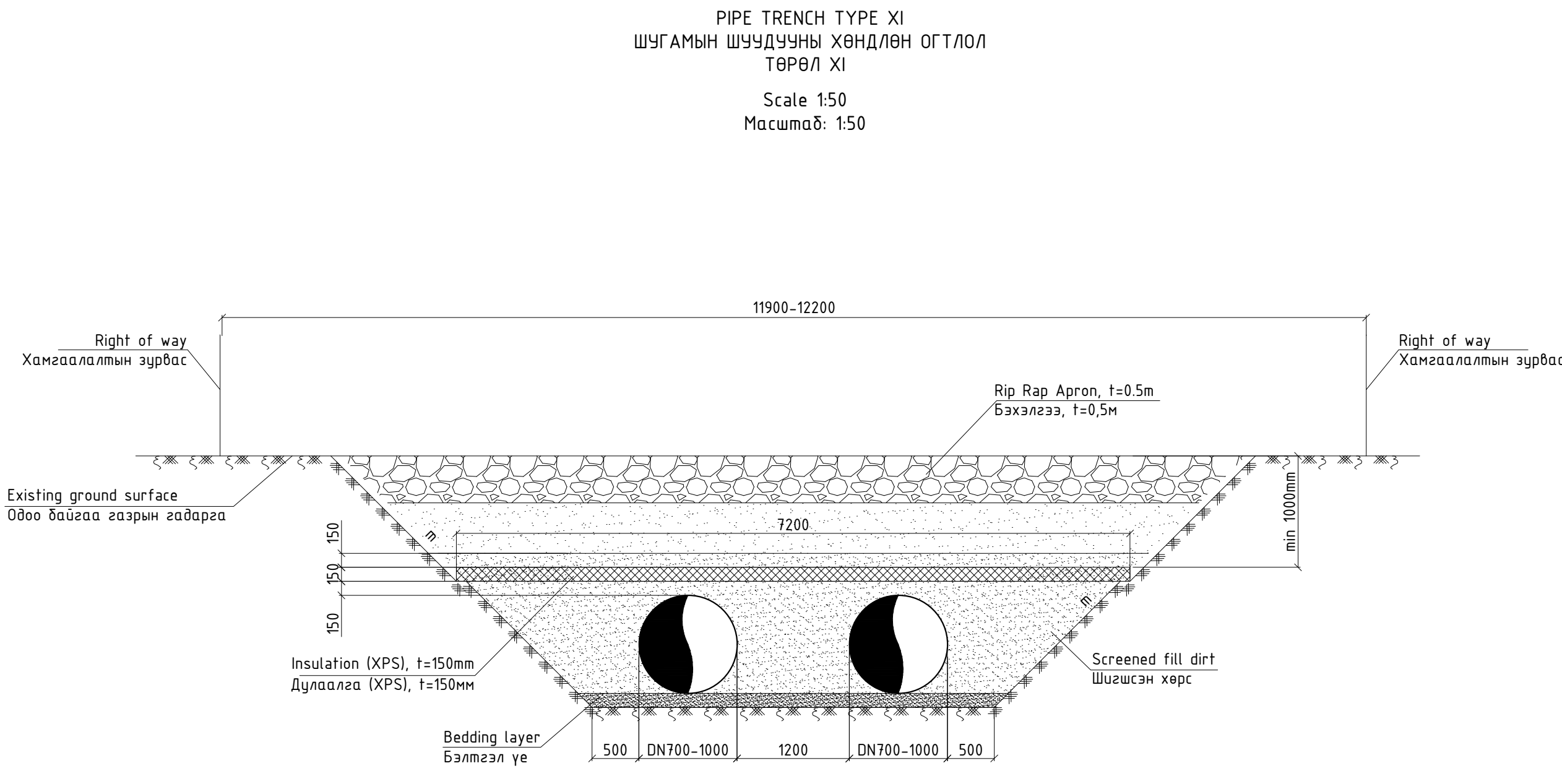
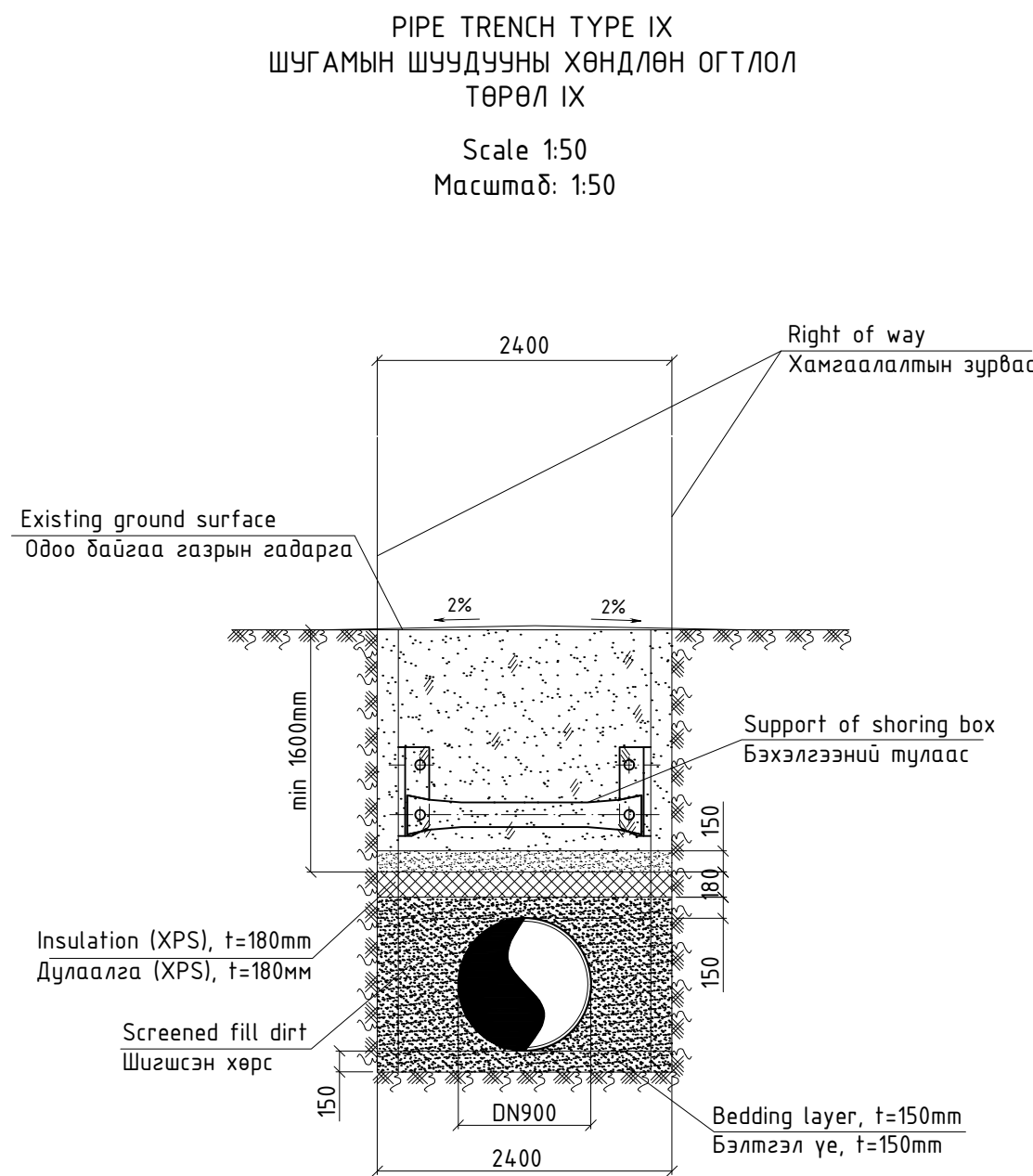
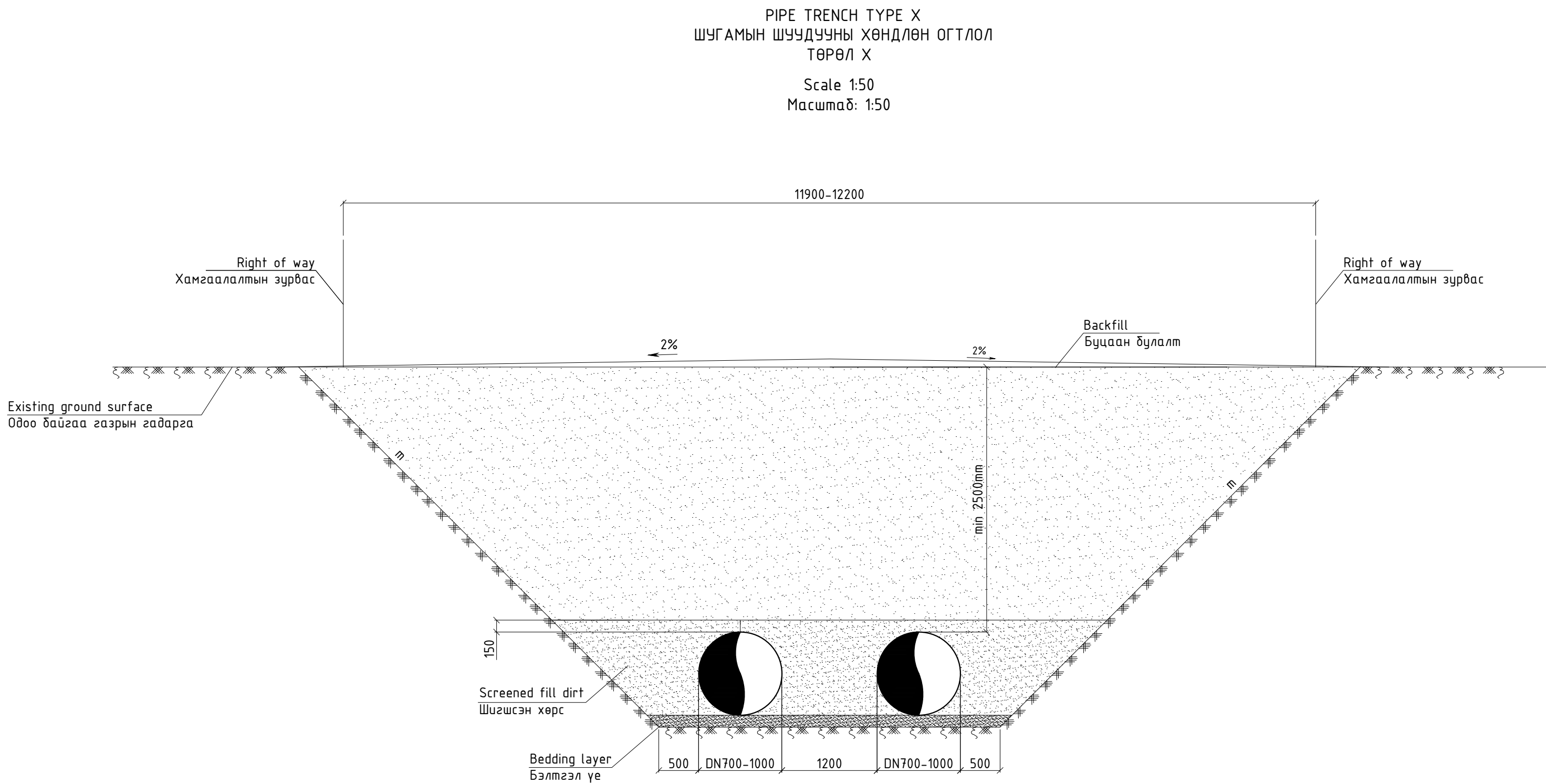
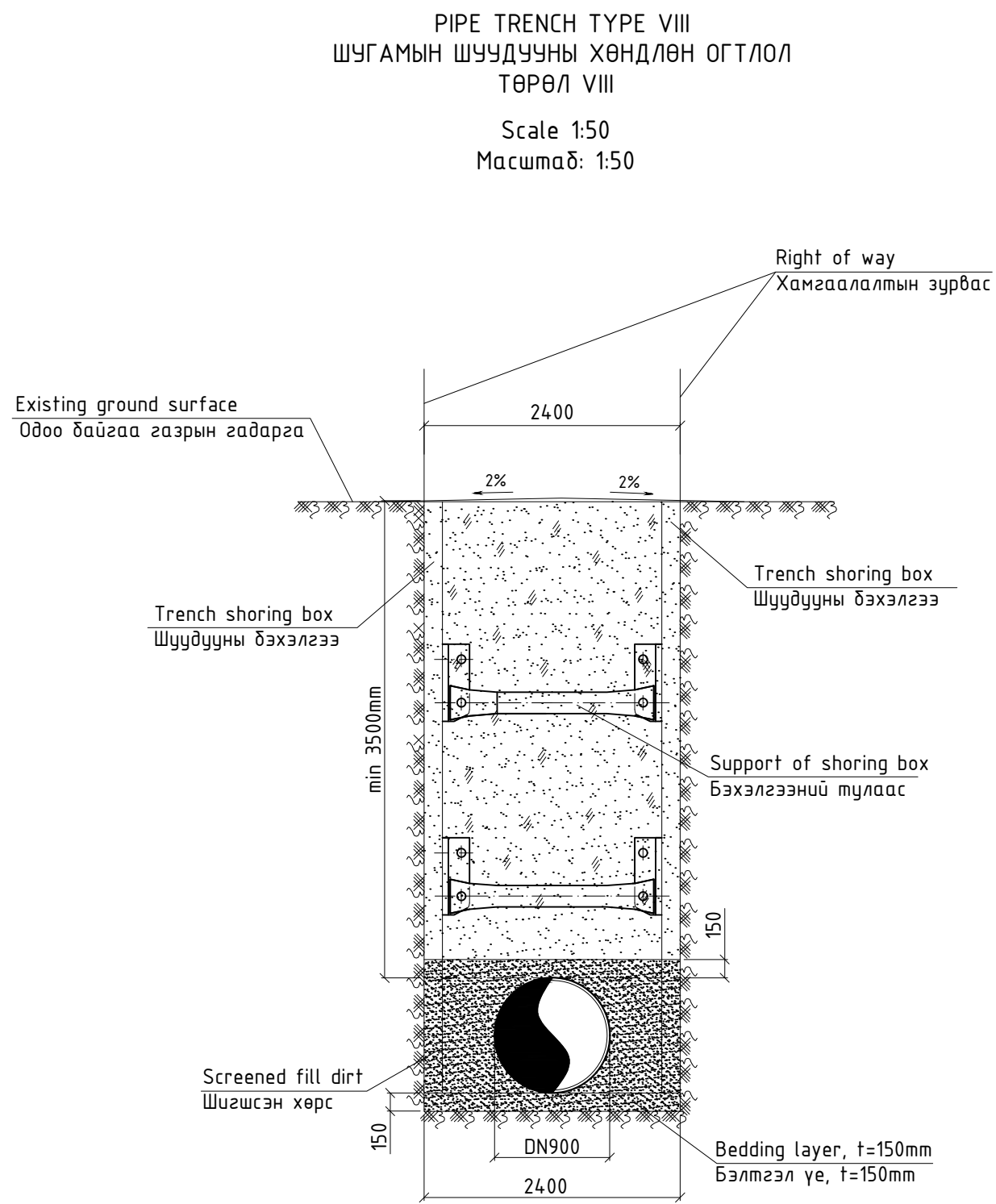
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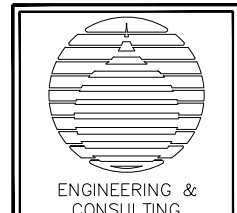


- See Appendix 3 and Appendix 9 of the Engineering Geotechnical investigation report for information on soil distribution in the boreholes.
- Цооногуудад тухсан хөрсний мэдээллийг инженер геологийн тайлангийн Хавсралт-3 болон Хавсралт-9-өөс үзнэ үү.

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PIPE TRENCH CROSS SECTION DETAILS /TYPICAL/

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Department Check/Ахиинженер	
Project Check/Мөхөжөр	D.CHAMPENOIS



PRESTIGE ENGINEERING

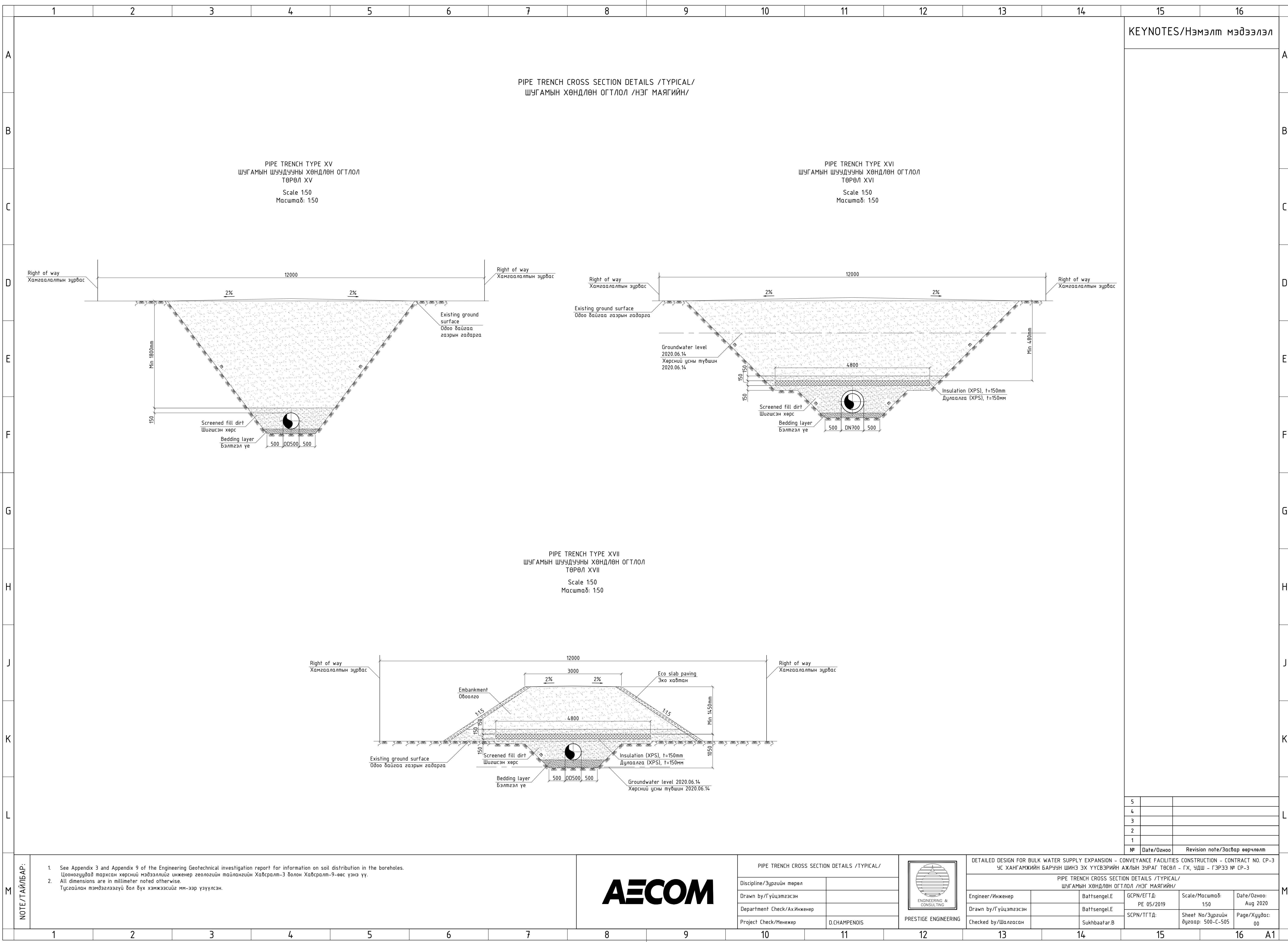
DETAILED DESIGN FOR BULK WATER SUPPLY EXPANSION - CONVEYANCE FACILITIES CONSTRUCTION - CONTRACT NO. CP-3  
УС ХАНГАМЖИЙН БАРУУН ШИНЭ ЭХ ҮҮСВЭРИЙН АЖЛЫН ЗУРАГ ТӨСӨЛ - ГХ, ҮДШ - ГЭРЭЭ № CP-3

PIPE TRENCH CROSS SECTION DETAILS /TYPICAL/  
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## Appendix L Technical Specifications Comprising the BWSE Environmental Design Basis

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The Sections of Technical Specifications contained in this Appendix have been extracted from the complete sets of Technical Specifications being prepared as part of detailed design for each of the three Contract Packages: CP-1, CP-2, and CP-3. They are not necessarily the latest version. The Sections here presented are for information purposes only - the definitive version of all Sections is in the relevant detailed design package that will form part of the Contract Documents for each CP.

Not all Sections of Technical Specifications are required for all CPs, nor are all Sections immutable across CPs - there are some modifications in recognition of the different contractual work required. To facilitate understanding of the Sections outside the context of their Design Package, in this Appendix the Section titles have been modified to show to which CP they refer.



## SECTION 01030 (CP-1)

## SPECIAL REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The Work of this section includes the furnishing of all labor, materials, tools and equipment required to perform Special Requirements as specified herein.
- B. Attention is directed to the SECTION VI – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for Work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT and as follows:
  - 1. All costs associated with the legal disposal of excess materials shall be borne by the Contractor.
  - 2. All costs associated with meeting the requirements of all permits shall be borne by the Contractor and shall be included for payment under the applicable items included in PART I – BIDDING PROCEDURES.

## 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

## 1.04 SUBMITTALS:

- A. Submit to the Engineer for approval, shop drawings, certificates of compliance and/or catalog cuts for all items to be furnished under this Contract. All submittals shall be provided in accordance with SECTION VI, GENERAL CONDITIONS OF CONTRACT and SECTION 01300, SUBMITTALS. **Contractor shall submit his qualifications to construct and test water-supply wells of the type specified WITH HIS BID. Reference SECTION 02672, Paragraph 1.04.A. for specific qualification materials that shall be submitted.**
- B. Digital Videodisc Recording
  - 1. Prior to the start of construction, video record, in color, the entire Project site(s) in the presence of the Engineer. Video recordings shall be in digital videodisc (DVD) format. Particular attention shall be made to the existing condition of roadway surfaces, curbing, berms, sidewalks, driveways, property bounds, landscaped areas, and any other items that might be affected by the Work.
  - 2. Video recordings shall be of excellent quality including clear and concise audio descriptions of the existing site(s) conditions. A copy of the first completed video

recording shall be furnished to the Engineer, prior to the start of construction, in order to establish the requirement for visual and audio quality. Two (2) copies of all video recordings shall be provided to the Engineer. Any recordings furnished which, in the opinion of the Engineer, are of poor quality or incomplete, shall be redone at no additional cost to the Owner.

3. Video recordings shall be made by the Contractor in the presence of the Owner/Engineer.
4. No construction activities shall commence until the video recordings have been completed, submitted to the Engineer and approved by the Engineer.

#### C. Health and Safety Plan

1. Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
2. Contractor shall be cognizant of the minimum standards norms set forth as follows:
  - a. MNS 4990:2015 Labour Safety. Labour Environment. Hygiene requirements.
  - b. MNS 5002:2000 Occupational safety and health. Noise. Requirement for general safety.
  - c. MNS 6654:2017 Occupational safety and health. Personal protective clothing. General requirements for selection and use of respiratory protection equipment.
  - d. MNS 4931:2000 Protective means. General requirement, classification.
  - e. MNS 6769:2019 Occupational safety and hygiene. Mechanical vibration. General requirements for measurement of human exposure to hand-transmitted vibration and its occupational exposure limit.
  - f. MNS 6770:2019 Occupational safety and hygiene. Mechanical vibration. Requirements for whole body vibration measurement and occupational exposure limit at workplace.
  - g. MNS ISO 45001:2019 Occupational health and safety management systems – Requirements with guidance for use.
  - h. MNS OSHAS 18002:2015 Occupational health and safety management systems. Guidelines for the implementation of OSHAS 18001.
  - i. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
  - j. MNS ISO 7708:2016 Air quality. Particle size fraction definition for health-related sampling.
  - k. MNS Labor Safety and Sanitary. General Requirements for Industrial operation.

- l. CCM 12-03-04 Regulation on occupational safety in construction manufacturing. Part One: General Requirements.
  - m. CCM-04-06 Regulation on occupational safety in construction manufacturing. Part Two: Regulation on Technical Operational Safety
  - n. CR12 101-05 Sample instruction on occupational safety during construction work.
  - o. Labor code of Mongolia
  - p. Law of Mongolia on Toxic Hazardous Chemicals
3. The Health and Safety Plan shall include, but not be limited to the following:
- a. Identification of Contractor's Site Safety Officer.
  - b. Identification of hazards and risks associated with the Project.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
4. The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.

D. Utilize the Shop Drawing Transmittal Forms supplied by the Engineer for all required submittals.

#### 1.05 PRODUCT HANDLING:

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage

and shall be covered to prevent exposure to adverse conditions prior to installation.

**1.06 DESIGN CRITERIA:**

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

**1.07 SPECIFICATIONS AND DRAWINGS:**

- A. All Work shall conform to these specifications and the accompanying drawings entitled:

**MCA MONGOLIA**

**DETAILED DESIGN FOR BULK WATER SYSTEM EXPANSION**

**WELL DRILLING AND CONSTRUCTION**

**CONTRACT NO. CP-1**

Dated ## consisting of 32 sheets, all made by the Engineer, on file with the Owner, and any changes, drawings, plans, and directions that may be furnished from time to time by the Engineer.

**1.08 COMMENCEMENT AND PROGRESS OF WORK:**

- A. Prior to the start of construction, the Owner and the Contractor shall obtain a permit for the commencement and execution of the work from the Urban Planning and Development Department.
- B. Promptly start and continue actual construction Work under this Contract with the necessary equipment to properly execute and complete the Work in the specified time. No cessation of construction activities will be allowed without the written approval of the Owner.
- C. Furnish to the Engineer a progress schedule for the Work prior to the start of construction.

**1.09 DETOURS AND ROAD ACCESSIBILITY:**

- A. Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.

**1.10 CHANGE IN AMOUNT OF WORK:**

- A. The Owner reserves the right to increase or decrease the amount of any item of the Work listed as may be found desirable or necessary during the carrying out of this Contract and the

unit prices included in PART I – BIDDING PROCEDURES shall apply without change to such variation in the quantity of each of the Bid items to the extent provided by law.

- B. Based on the actual work required, the increase or decrease in the quantity of any bid item of the Work included in PART I – BIDDING PROCEDURES shall apply without changes to the unit prices.

#### 1.11 SCOPE OF WORK AND SEQUENCE OF CONSTRUCTION:

- A. The Work to be done under this Contract consists of the construction of water-supply wells as specified and/or as shown on the Contract Drawings. Refer to SECTION 01010, SUMMARY OF WORK.
- B. For the protection of life and property, insure that no excavation is left open, unguarded, or water filled during any period of time when Work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other Work areas.
- C. The Owner reserves the right to schedule the Work at any location within the Project area. At the same time the Owner may schedule the suspension of Work at any location.
- D. The Work of this Contract may require existing utilities to be bypassed, removed and relaid. The Contractor shall pay for all costs associated with this Work at no additional cost to the Owner except as specified in SECTION 01025, MEASUREMENT AND PAYMENT.
- E. The Owner has obtained various permits for this Project, which are included as APPENDIX B. Meet all requirements/conditions of these permits during the construction of this Project. All costs associated with this Work shall be borne by the Contractor and included in the prices bid under the applicable items of PART I – BIDDING PROCEDURE.
- F. All damage to existing utilities, roadways, and the like shall be repaired and/or replaced by the Contractor as approved by the utility company and shall be borne by the Contractor.
- G. The control of dust shall be accomplished by the application of clean water. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. The use of calcium chloride to control dust is not allowed.
- H. No construction activity shall be allowed on the Project for two working days prior to the following dates:

- New Year's Day - January 1
  - Tsagan Sar – Defined day in February, usually the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> day of spring month under lunar calendar.
  - International Womans' Day – March 8
  - Buddha Day- Fifteenth Day of first summer month under lunar calendar
  - Childrens' Day – June 1
  - National Naadam Holiday – July 11 - 15
  - Great Chingis Khaan Birthday – First day of first winter month under Lunar calendar.
  - State Proclamation Day – November 26
  - Independence Day – November 29
- I. The Contractor shall secure use of space that they have legal access to for the temporary buildings specified under SECTION 01500, TEMPORARY FACILITIES. The temporary buildings shall not be placed along the edge of roadways. The Contractor shall be responsible for clearing, grubbing, grading, providing of grading materials, permits, and full restoration of the temporary building location(s).

#### 1.12 EXISTING UTILITIES: NOT USED

#### 1.13 VISITS TO THE SITE(S):

- A. Before submitting a Bid, visit the site(s) to examine existing conditions and become thoroughly acquainted with the effort required to perform the Work.
- B. Study the Contract Documents and compare the same with the information gathered during examination of the site(s), as no extra compensation will be authorized for extra Work caused by unfamiliarity with the site(s) and/or Contract Documents or the conditions peculiar to this Project.

#### 1.14 DISPOSAL OF EXCESS MATERIAL:

- A. All pavement road base, surplus suitable material removed from the excavations, loam not required for re-use in the Work shall be legally disposed of by the Contractor.
- B. Legally dispose of all unsuitable material removed as part of the Work.

#### 1.15 TECHNICAL SPECIFICATIONS:

- A. Where reference is made to MNS, ISO, MNS ASTM, MNS AASHTO, MNS EN, CCfFSU (SNIP), CCM (BNbD), CR BD, ASTM, AWWA and AASHTO specifications or other associations, it is understood that the latest revisions as of the date of the Contract Documents shall apply.

#### 1.16 PERMITS, FEES AND BONDS:

- A. Obtain and comply with all required permits, pay all fees and provide all bonds necessary to complete the Work as specified. Be solely responsible for performing any necessary acts and providing any materials required in order to comply with any and all terms and conditions set forth in any permits and licenses. Refer to APPENDIX B for all permits, which have been



obtained for the Project. The Owner has not obtained all permits and licenses required for this Project. The Contractor shall obtain and pay for any other permits required to complete the Project including but not limited to Road Opening Permit, Blasting, and Phase II General Stormwater Permit for small construction projects.

#### 1.17 NOTIFICATION OF CONSTRUCTION:

- A. At least 5 business days prior to initiating excavation Work, notify the following entities, whose facility is located in the excavation zone, in writing, of where and when excavation(s) are scheduled and request their engineer to be present at the site during excavation.
  - 1. Municipality Road Development Department
  - 2. USUG
  - 3. Communication Companies
  - 4. Power Companies

#### 1.18 BOUNDS AND PROPERTY MARKERS:

- A. Prior to initiating construction, engage an independent Registered Land Surveyor (in the State where the Project is located) to provide permanent reference points for all bounds and property markers along the line of the Work that may be disturbed during construction. Submit copies of all ties to the bounds and property markers to the Engineer prior to excavation at the site(s).
- B. Any bounds or markers disturbed shall be replaced utilizing the services of a Professional Land Surveyor in the State where the Project is located. The cost of replacing markers disturbed by the Contractor's operations shall be at the Contractor's expense.

#### 1.19 TWENTY-FOUR HOUR EMERGENCY SERVICE:

- A. Maintain a 24-hour, 7-day a week telephone service. The Contractor's emergency personnel and equipment shall be within 30 minutes travel time to the Project site(s) in order to handle emergency requirements relating to the Contractor's Work. A list of the personnel and their telephone numbers, pager numbers, and cell phone numbers, shall be submitted to the Engineer, the Owner and to the local Police and Fire Departments.
- B. This requirement shall apply for the duration of the Project and shall be updated as necessary. This list shall be submitted on the Contractor's letterhead and shall state that should an emergency arise during the implementation of the Project, these people are to be contacted. Submit this letter to the Engineer prior to initiating construction.

#### 1.20 HOURS OF OPERATION:

- A. The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - 1. Certain aspects of the Work will require round-the-clock work operations, i.e., 24-hours per day, seven-days per week.

2. Contractor shall arrange with the Owner and Engineer regarding normal work hours, i.e., for those aspects of the work that do not require round-the-clock operations.

#### 1.21 DISPOSAL OF DEBRIS:

- A. During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- B. Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- C. At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.

#### 1.22 RECORD DRAWINGS:

- A. Throughout the course of completing the Work, continually maintain a set of record drawings that incorporate all approved changes made by the Contractor and all subcontractors to the Drawings included in the executed Contract between the Owner and the Contractor. Clearly and concisely mark up the individual Drawings and/or incorporate sketches that show approved changes made during the execution of the Work. Following completion of the Work, incorporate all approved changes electronically into one (1) complete set of record drawings. Record drawings shall be complete in every way and shall show the full extent of the executed Work. Special attention shall be given to concealed Work.
- B. Change Orders, Addenda items and field changes shall be included where applicable. Additional specific requirements relative to record drawings may be called for in the individual sections of the Specifications. Submit a review copy to the Engineer for approval and make any revisions required by the Engineer in order to make the record drawings complete. After acceptance by the Engineer, deliver a full scale reproducible hard copy and a compact disk with Auto Cad files of the record drawings to the Engineer.
- C. An electronic copy of the Engineer's Auto Cad files shall be made available to the Contractor for the purpose of completing the required computer drafted record drawings.

#### 1.23 INITIAL OPERATION OF NEW FACILITIES: NOT USED

#### 1.24 CONTINUOUS OPERATING CRITERIA: NOT USED

#### 1.25 SCHEDULE OF VALUES:

- A. Submit a schedule of values for use in preparing the monthly progress payments described in the SECTION VI GENERAL CONDITIONS OF CONTRACT.

- B. The schedule of values shall be submitted to the Engineer for review and approval at least 30 calendar days prior to the first progress payment request. The acceptable schedule of values shall be used for the duration of the Project.

#### 1.26 OPERATION AND MAINTENANCE MANUALS: NOT USED

#### 1.27 MANUFACTURER'S SERVICES: NOT USED

- A. Provide as specified in 01730 and herein.

- B. Installation and Start-up

1. Make arrangements with each equipment supplier or manufacturer to furnish the services of a factory-trained service engineer who is specifically trained on the type of equipment being furnished for the sole purpose and use of the Owner and Engineer to assist during installation and start-up of all equipment and systems furnished by that supplier or manufacturer.
2. Minimum length of time specified for this service shall be exclusive of travel time and of correction of defects, testing, and training.
3. The manufacturer's engineer will verify, in writing, that the equipment has been installed and serviced so as to be acceptable to the equipment manufacturer in order that it will provide safe and efficient operation as intended by the Engineer and the manufacturer. The Engineer will provide a form entitled "Certification of Proper Equipment Installation" which is to be signed by the manufacturer's representative and the Contractor's representative for each piece of equipment.

- C. Correction of Defects

1. Nothing specified herein shall provide relief of the responsibility of providing sufficient service to place all equipment or systems into satisfactory operation.
2. All time and materials needed to correct defective equipment shall be provided at no cost to the Owner.

- D. Testing

1. Prior to testing, each equipment supplier or manufacturer shall furnish a written certification that the equipment is ready for operation. A copy of this certification shall be furnished to the Engineer.
2. Furnish the labor, tools, equipment, power, and clean water necessary to perform field-testing to determine that the supplied equipment including controls and alarms meets hydraulic, electric, mechanical and performance requirements. All tests shall be performed in the presence of the Engineer.

- E. Training

1. Wherever called for in the Specifications, have each equipment supplier or manufacturer furnish the services of a fully qualified field service engineer to provide operator training

in the complete operation and maintenance of all equipment furnished by that supplier or manufacturer.

2. The minimum length of time specified for this service shall be exclusive of travel time and shall follow and be exclusive of installation and start-up, correction of defects and testing.
3. Schedule training sessions in conjunction with and as approved by the Engineer. This training will be witnessed and verified by a representative appointed by the Engineer. The Engineer has the right to reject the training by the equipment supplier or manufacturer and to require additional training. The items addressed by the training session shall include, but not be limited to, system description, system operation, system disassembly and reassembly, lubrication, routine maintenance, corrective maintenance, use of operation and maintenance manual, system troubleshooting and ordering of spare parts.
4. The Engineer will provide a form entitled "Verification of Manufacturer's Equipment Training" which is to be signed by all parties at the completion of each training session.

1.28 SPARE PARTS: NOT USED

1.29 SPECIALTY TOOLS: NOT USED

1.30 STATUTORY REQUIREMENTS IN GENERAL:

- A. Owner and Contractor recognize that other rights, duties, and obligations with respect to public construction contracts are also provided by statute, notwithstanding the fact that they may not be specifically enumerated herein. Accordingly, any provisions required by statute to be included in this contract shall be deemed to be so included as though fully set forth herein. However, compliance with a statute does not diminish the Contractor's responsibilities hereunder.
- B. Contractor shall keep fully informed of all existing and future State and Federal Laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same and of all provisions required by law to be made a part of this Contract, all of which provisions are hereby incorporated by reference and made a part thereof.
- C. If any discrepancy or inconsistency is discovered in the Contract Documents for this Work in relation to any such law, ordinance, regulation, order or decree, report the same to the Engineer in writing. Contractor shall, at all times, observe and comply with, and cause all agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the Owner and Engineer and all of its and their officers, agents, and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by itself or its employees or subcontractors.
- D. All materials furnished and Work done shall comply with all State and Federal laws and regulations.

1.31 RELATION OF SEWER MAINS TO WATER LINES: NOT USED

1.32 UTILITY COORDINATION: NOT USED

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION – Not Used

END OF SECTION

SEE FOLLOWING FORMS

1. Verification of Manufacturer's Equipment Training
2. Operation and Maintenance Manual Review Checklist
3. Spare Parts Inventory
4. Certification of Proper Equipment Installation



## VERIFICATION OF MANUFACTURER'S EQUIPMENT TRAINING

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Training:	
Instructor(s):	
Title:	
Representing:	
Facility Staff in Attendance	
AECOM Representative(s):	
Contractor's Representative(s):	
___ System Description	___ Corrective Maintenance
___ System Operation	___ Use of Manufacturer's Manual
___ System Disassembly and Reassembly	___ Ordering Spare Parts
___ Lubrication	___ Other
___ Routine Maintenance	
I have performed the training described above and concur with this verification.	
Witnessed by:	Manufacturer's Instructor Signature

Title	Date	Title	Date

## OPERATION AND MAINTENANCE MANUAL REVIEW CHECKLIST

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Equipment Transmittal No.:	
O&M Manual Transmittal No.:	
1.	Correct number of copies of Operation and Maintenance Manual Supplied
2.	General
	a. Manual Customized
	b. Manual contains information on complete system (design, installation, operation and maintenance instructions)
	c. All material contained in manual is legible
	d. Permanent Binder and Labeled
	e. Index
3.	Contact Information
	a. Name, address, and telephone number of manufacturer
	b. Name, address, and telephone number of nearest source of replacement parts and service
4.	Equipment Information
	a. Equipment drawings, schematics, plates, and layouts
	b. Equipment Performance Curves
	c. Lubrication Schedule
	d. Maintenance Schedule
	e. Trouble Shooting Guide

		f. Parts List (part manufacturer, catalog number, etc.)
		g. Current Part Costs
		h. Recommended Spare Parts
		I. Special Tools Required
Remarks:		

**SPARE PARTS INVENTORY**

CLIENT:		ENGINEER:			
PROJECT:		CONTRACTOR:			
Equipment:					
Specification Section:					
AECOM Representative(s):					
Part Number	Part Description	Quantity	Owner	Initial Date	Initial Date




**CERTIFICATION OF PROPER  
EQUIPMENT INSTALLATION**

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Equipment Inspection:	
Manufacturer's Representative(s):	
Representing:	
Contractor's Representative(s)	
Equipment Installation	
____ Equipment Mounting / Supports	____ Lubrication
____ Safety (guards and/or signage)	____ Calibration
____ Electrical System	____ Spare Parts
____ Instrumentation and/or Control System	____ Other _____
Corrective Action Required:	
Corrective Action Completed:	

I hereby certify that the above noted equipment is ready for safe and efficient operation.	
Witnessed by:  _____  Contractor's Representative Signature  Date: _____	Certified by:  _____  Manufacturer's Representative Signature  Date: _____

## SECTION 01030 (CP-2)

## SPECIAL REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The Work of this section includes the furnishing of all labor, materials, tools and equipment required to perform Special Requirements as specified herein.
- B. Attention is directed to the SECTION VI – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.
- C. Environmental and Social Management Plans (ESMP) are included in Appendix C of the Specifications. The appended ESMPs have the full weight of the Technical Specifications and must be adhered to by the Contractor.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for Work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT and as follows:
  - 1. All costs associated with locating, maintaining location marks, excavation, refilling, compaction, repairing utilities broken due to the Contractor's operations, time delays relative to existing utilities and all other Work associated with utilities shall be included for payment under the applicable pipe laying item included in PART I – BIDDING PROCEDURES.
  - 2. All costs associated with the legal disposal of excess materials shall be borne by the Contractor.
  - 3. No additional payment will be made for corrective work associated with furnishing and installing bedding materials for refill of excavations carried to grades lower than specified. If inadequate dewatering methods cause softening of subgrade areas, then remove the unsuitable material and replace with common fill at the Contractors cost.
  - 4. No payment will be made for temporary shoring of trench walls utilizing trench boxes and/or steel plates. Where timber or steel sheeting is used and is not specified to be paid for separately and ordered left in place by the Engineer, the Contractor has the option of leaving it in or removing it after it has been cut off 300 mm (1 ft) above the top of the pipe.
  - 5. Pay all fees for permits associated with blasting operations. Unauthorized excavations in rock, or excavations made beyond or below the specified limits shall be refilled and compacted with common fill and shall be borne by the Contractor. Perform blasting operation(s) in such a manner that no existing utilities are disturbed. All damage to existing utilities or roadway surfaces outside the trench limits caused by the Work of the

Contractor or its Subcontractor(s) shall be repaired and/or replaced immediately and shall be borne by the Contractor.

6. No additional payment will be made for the relocation and/or support of any obstruction encountered along the line of Work.
7. Testing, and jetting of trenches utilizing the Owner's (USUG's) water system may be available, however the Owner (USUG) does not guarantee that its water supply will be available at any time during the duration of the Project. Contractor is responsible for making all arrangements and gathering necessary permissions from the Owner's (USUG's) water district for use of water. Use of water shall be at the Contractor's expense. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
8. Provide detailed plan(s) to the Owner and/or the Road Development Department of Municipality of Ulaanbaatar City for all proposed detours and/or partial roadway closings made necessary by the Work. Obtain written approval for all proposed detours and/or partial roadway closings prior to the start of Work. No payment will be made for Work performed in areas of the Project that require an approved traffic management plan until it has been secured.
9. All costs associated with repairing settlement of trenches shall be borne by the Contractor.
10. All costs associated with meeting the requirements of all permits shall be borne by the Contractor and shall be included for payment under the applicable items included in PART I – BIDDING PROCEDURES.

### 1.03 DEFINITIONS:

A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

B. As used in this section, the following terms are understood to have the following meanings:

1. "Furnish" shall mean purchase and deliver to the Project Site, complete with every necessary appurtenance and support.
2. "Install" shall mean unload at the delivery point at the Project Site and perform all Work necessary to establish proper location, secure mounting and operation in the Project.
3. "Provide" shall mean furnish and install.
4. "Work" shall mean all labor, materials, equipment, apparatus, controls, accessories, and all other items required for a proper and complete installation.
5. "Piping" shall mean, in addition to pipe or tubing all backfilling and bedding, fittings, flanges, unions, valves, strainers, specialties, drains, hangers and supports, and all other accessories relative to such pipe or tubing.
6. "Concealed" shall mean hidden from sight in chases, furred spaces, shafts, crawl spaces, embedded in construction, buried, and/or similar conditions.

7. "Exposed" shall mean not concealed as defined above.
8. "Furnished by others" shall mean materials or equipment purchased and set in place under other sections of the Contract and connected to the systems covered by this section of the Specifications by this trade Contractor.
9. "Coordinate" shall mean all Work provided under this section shall be correlated with the Work of other trades.

#### 1.04 SUBMITTALS:

A. Submit to the Engineer for approval, shop drawings, certificates of compliance and/or catalog cuts for all items to be furnished under this Contract. All submittals shall be provided in accordance with SECTION VI, GENERAL CONDITIONS OF CONTRACT and SECTION 01300, SUBMITTALS.

#### B. Digital Videodisc Recording

1. Prior to the start of construction, video record, in color, the entire Project site(s) in the presence of the Engineer. Video recordings shall be in digital videodisc (DVD) format. Particular attention shall be made to the existing condition of roadway surfaces, curbing, berms, sidewalks, driveways, property bounds, landscaped areas, and any other items that might be affected by the Work.
2. Video recordings shall be of excellent quality including clear and concise audio descriptions of the existing site(s) conditions. A copy of the first completed video recording shall be furnished to the Engineer, prior to the start of construction, in order to establish the requirement for visual and audio quality. Two (2) copies of all video recordings shall be provided to the Engineer. Any recordings furnished which, in the opinion of the Engineer, are of poor quality or incomplete, shall be redone at no additional cost to the Owner.
3. Video recordings shall be made by the Contractor in the presence of the Owner/Engineer.
4. No construction activities shall commence until the video recordings have been completed, submitted to the Engineer and approved by the Engineer.

#### C. Health and Safety Plan

1. Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site and the requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
2. Contractor shall be cognizant of the minimum standards norms set forth as follows:
  - a. MNS 4990:2015 Labour Safety. Labour Environment. Hygiene requirements.
  - b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.

- c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
  - d. MNS 4931:2000 Protective means. General requirement, classification.
  - e. MNS 4968:2000 Occupational Safety and Health. Production processing general requirements
  - f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
  - g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements
  - h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa
  - i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
  - j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
  - k. Labour code of Mongolia
  - l. Law of Mongolia on Toxic Hazardous Chemicals
3. The Health and Safety Plan shall include, but not be limited to the following:
- a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
  - b. Identification of hazards and risks associated with the Project.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.



4. The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
5. All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
6. The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss of property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

#### D. Emergency Action Plan

1. Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
2. The Emergency Action Plan shall include, but not be limited to the following:
  - a. Identification of hazards and risks associated with the Project.
  - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Levels of protection and selection of equipment procedures.
  - e. Field monitoring of petroleum products and potential pollutants.
  - f. Contingency and emergency procedures.
  - g. Listing of emergency contacts.

#### E. Hazardous Waste Management Plan

1. The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.

2. Certain chemical and physical agents (*i.e.*, asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulator agencies, the Contractor shall notify the Owner immediately of the nature of the incident.
3. The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
  - a. The location of potential hazards.
  - b. The potential adverse health effects posted by such hazards.
  - c. Proper safe work practices to prevent or reduce potential exposure.
  - d. Proper protective measures and equipment required.
  - e. Proper use of protective equipment.
  - f. Proper response to exposure incidents.
  - g. Proper disposal of hazardous materials.
4. The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:
  - a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
  - b. Hearing protection (plugs, muffs, etc.).
  - c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).

- F. Utilize the Shop Drawing Transmittal Forms supplied by the Engineer for all required submittals.

#### 1.05 PRODUCT HANDLING:

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage and shall be covered to prevent exposure to adverse conditions prior to installation.

#### 1.06 DESIGN CRITERIA:

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents.

The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.

- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

#### 1.07 SPECIFICATIONS AND DRAWINGS:

- A. All Work shall conform to these specifications and the accompanying drawings entitled:

### **MCA MONGOLIA**

### **BULK WATER SYSTEM EXPANSION**

Dated ## consisting of ## sheets, all made by the Engineer, on file with the Owner, and any changes, drawings, plans, and directions that may be furnished from time to time by the Engineer.

#### 1.08 COMMENCEMENT AND PROGRESS OF WORK:

- A. Prior to the start of construction, the Owner and the Contractor shall obtain a permit for the commencement and execution of the work from the Urban Planning and Development Department.
- B. Promptly start and continue actual construction Work under this Contract with the necessary equipment to properly execute and complete the Work in the specified time. No cessation of construction activities will be allowed without the written approval of the Owner.
- C. Furnish to the Engineer a progress schedule for the Work prior to the start of construction.

#### 1.09 DETOURS AND ROAD ACCESSIBILITY:

- A. Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
- B. There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
- C. Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.

#### 1.10 CHANGE IN AMOUNT OF WORK:

- A. The Owner reserves the right to increase or decrease the amount of any item of the Work listed as may be found desirable or necessary during the carrying out of this Contract and the

unit prices included in PART I – BIDDING PROCEDURES shall apply without change to such variation in the quantity of each of the Bid items to the extent provided by law.

- B. Based on the actual work required, the increase or decrease in the quantity of any bid item of the Work included in PART I – BIDDING PROCEDURES shall apply without changes to the unit prices.

#### 1.11 SCOPE OF WORK AND SEQUENCE OF CONSTRUCTION:

- A. The Work to be done under this Contract consists of the construction of the Advanced Water Purification Plant (AWPP) as specified and/or as shown on the Contract Drawings. Refer to SECTION 01010, SUMMARY OF WORK.
- B. For the protection of life and property all backfilling operations shall follow closely behind pipe laying. Insure that no excavation is left open, unguarded, or water filled during any period of time when Work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other Work areas.
- C. The Owner reserves the right to schedule the Work at any location within the Project area. At the same time the Owner may schedule the suspension of Work at any location.
- D. The Work of this Contract may require existing utilities to be bypassed, removed and relaid. If required, the Contractor shall obtain Owners prior approval of a not-to-exceed Time and Materials proposal including but not limited to Contractors cost, profit, insurance, overhead and other cost that are required to complete the works. Contractor shall include the complete cost back-up information to the Owner for the Owners review and approval prior to commencing the work
- E. The Owner has obtained various permits for this Project, which are included as APPENDIX B Meet all requirements/conditions of these permits during the construction of this Project. All costs associated with this Work shall be borne by the Contractor and included in the prices bid under the applicable items of PART I – BIDDING PROCEUDRES
- F. Pre-blasting of ledge is not allowed on this Project. No payment will be made for ledge removal on this Project in areas where pre-blasting has occurred.
- G. All damage to existing utilities, roadways, and the like shall be repaired and/or replaced by the Contractor as approved by the utility company and shall be borne by the Contractor.
- H. The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.

- I. The compaction of trenches shall be accomplished by mechanical compaction and/or jetting. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the jetting of trenches shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
- J. The testing of tanks and/or pipelines shall be accomplished by using clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the testing of tanks and/or pipelines shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
- K. Except for an emergency condition as approved by the Owner in writing, premium wages will not be paid for Work performed on Sunday, holiday or workdays longer than eight (8) hours. All costs incurred by the Owner caused by the Contractor's Work performed on Sunday, holiday or workdays longer than eight (8) hours shall be borne by the Contractor which will be deducted from monthly payment requests.
- L. No construction activity shall be allowed on the Project for two working days prior to the following dates:

- |   |  |
|---|--|
| • New Year's Day - January 1  | • National Naadam Holiday – July 11 - 15   |
| • Tsagan Sar – Defined day in February, usually the 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> day of spring month under lunar calendar. | • Great Chingis Khaan Birthday – First day of first winter month under Lunar calendar. |
| • International Womans' Day – March 8   | • State Proclamation Day – November 26   |
| • Buddha Day- Fifteenth Day of first summer month under lunar calendar  | • Independence Day – November 29   |
| • Childrens' Day – June 1   |  |

All construction equipment and materials not incorporated in the Work to date shall be removed from the Work areas where construction activity is ceased. All excavations shall be backfilled and paved as specified and/or directed by the Engineer. Incorporate this requirement into the Project Schedule. Failure to comply with this requirement will result in no payment for work performed.

- M. The Contractor shall secure use of space that they have legal access to for the temporary buildings specified under SECTION 01500, TEMPORARY FACILITIES. The temporary buildings shall not be placed along the edge of roadways. The Contractor shall be

responsible for clearing, grubbing, grading, providing of grading materials, permits, and full restoration of the temporary building location(s).

#### 1.12 EXISTING UTILITIES:

- A. The location and size of existing sewers, drains, culverts, water mains, gas mains, cables, service pipes, and other utilities shown on the Contract Drawings, were obtained from the results of surveys and existing records and are shown as approximate only, to guide the Bidders in the preparation of their Bid. The various utility companies will determine the location and depth of existing utilities by marking them out upon the ground and by experimental excavations by the Contractor prior to and as the Work progresses. The Contract Drawings do not show the exact location and depth of all utilities, nor do they show all utilities or the number of lines for each utility that may be encountered.
- B. Assume that there are existing utility connections to each and every building or structure along the line of Work, whether they appear on the Contract Drawings or not. Notify the proper utility companies and obtain and preserve the marked location(s) of all existing utilities that may be encountered along the line of Work, until such time as such markings are no longer required.
- C. Experimental trench excavations are to be made prior to commencing pipe laying operations. Excavate by hand as necessary in advance of the trenching equipment to determine the exact location and depth of each utility that may be encountered. Excavation equipment shall not be used within three (3) feet of the utility to be crossed. Continue to excavate by hand around these utilities after ascertaining their exact location and depth.
- D. All utilities interfered with or damaged shall be replaced and/or repaired immediately. Carefully bed, tamp and fully consolidate refill material around and under all existing utilities encountered or crossed unless otherwise specified as approved by the Engineer.
- E. Protection of all existing utilities in the vicinity of the Work and the assurance of uninterrupted service from existing utilities throughout construction is the responsibility of the Contractor.
- F. In the event that the Contractor's Work results in damages to existing utilities, provide all necessary materials, equipment and labor necessary to satisfactorily repair damaged utilities immediately at no cost to the Owner.
- G. Notify the Water Utility 24 hours prior to connecting to and/or bypassing any existing water main, or as required by the utility. Do not operate any existing water system valves. All such operations shall be coordinated with and performed by Water Utility personnel.

#### 1.13 VISITS TO THE SITE(S):

- A. Before submitting a Bid, visit the site(s) to examine existing conditions and become thoroughly acquainted with the effort required to perform the Work.
- B. Study the Contract Documents and compare the same with the information gathered during examination of the site(s), as no extra compensation will be authorized for extra Work caused by unfamiliarity with the site(s) and/or Contract Documents or the conditions peculiar to this Project.



**1.14 DISPOSAL OF EXCESS MATERIAL:**

- A. All pavement road base, surplus suitable material removed from the excavations, loam not required for re-use in the Work shall be legally disposed of by the Contractor.
- B. Legally dispose of all unsuitable material removed as part of the Work.

**1.15 TECHNICAL SPECIFICATIONS:**

- A. Where reference is made to MNS, ISO, MNS ASTM, MNS AASHTO, MNS EN, CCfFSU (SNIP), CCM (BNbD), CR BD, ASTM, AWWA and AASHTO specifications or other associations, it is understood that the latest revisions as of the date of the Contract Documents shall apply.

**1.16 PERMITS, FEES AND BONDS:**

- A. Obtain and comply with all required permits, pay all fees and provide all bonds necessary to complete the Work as specified. Be solely responsible for performing any necessary acts and providing any materials required in order to comply with any and all terms and conditions set forth in any permits and licenses. Refer to APPENDIX B for all permits, which have been obtained for the Project. The Owner has not obtained all permits and licenses required for this Project. The Contractor shall obtain and pay for any other permits required to complete the Project including but not limited to Road Opening Permit, Blasting, and Phase II General Stormwater Permit for small construction projects.

**1.17 NOTIFICATION OF CONSTRUCTION:**

- A. At least 5 business days prior to initiating excavation Work, notify the following entities, whose facility is located in the excavation zone, in writing, of where and when excavation(s) are scheduled and request their engineer to be present at the site during excavation.
  - 1. Municipality Road Development Department
  - 2. USUG
  - 3. Communication Companies
  - 4. Power Companies

**1.18 BOUNDS AND PROPERTY MARKERS:**

- A. Prior to initiating construction, engage an independent Registered Land Surveyor (in the State where the Project is located) to provide permanent reference points for all bounds and property markers along the line of the Work that may be disturbed during construction. Submit copies of all ties to the bounds and property markers to the Engineer prior to excavation at the site(s).
- B. Any bounds or markers disturbed shall be replaced utilizing the services of a Professional Land Surveyor in the State where the Project is located. The cost of replacing markers disturbed by the Contractor's operations shall be at the Contractor's expense.

**1.19 TWENTY-FOUR HOUR EMERGENCY SERVICE:**

- A. Maintain a 24-hour, 7-day a week telephone service. The Contractor's emergency personnel and equipment shall be within 30 minutes travel time to the Project site(s) in order to handle emergency requirements such as, but not limited to, settled trenches, clogged drains, and rain damage and/or any other emergency situation relating to the Contractor's Work. A list of the personnel and their telephone numbers, pager numbers, and cell phone numbers, shall be submitted to the Engineer, the Owner and to the local Police and Fire Departments.
- B. This requirement shall apply for the duration of the Project and shall be updated as necessary. This list shall be submitted on the Contractor's letterhead and shall state that should an emergency arise during the implementation of the Project, these people are to be contacted. Submit this letter to the Engineer prior to initiating construction.

**1.20 HOURS OF OPERATION:**

- A. The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - 1. No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - 2. No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.

**1.21 DISPOSAL OF DEBRIS:**

- A. During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- B. Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- C. At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.

**1.22 INITIAL OPERATION OF NEW FACILITIES:**

- A. Operation and maintenance manuals shall be submitted to the Engineer in accordance with SECTION VI GENERAL CONDITIONS OF CONTRACT at least one (1) month prior to the scheduling of any manufacturers training.

- B. Refer to Specification 01650 Testing and Start-up Requirements for operation of new facilities. Section 01650 shall supersede all other start-up, testing, and commissioning procedures that may be described elsewhere in the project documents including the General Conditions of the Contract.

#### 1.23 CONTINUOUS OPERATING CRITERIA:

- A. Conduct operations in such a manner and sequence that shall neither result in a disruption of the amenities, nor interfere with the functional organization and workings of existing facilities.
- B. Furnish, install and operate any piping, equipment and appurtenances necessary to provide the temporary services, facilities, and bypasses required during construction including, but not limited to, bypass pumping, flow barriers and diversions.
- C. The Owner will operate and maintain all existing systems and equipment. Notify and coordinate with the Owner all temporary modifications to existing facilities operations required for construction within, or interfacing with, the existing facilities. Operate and maintain all proposed facilities until such time as the Owner accepts them.
- D. A carefully planned and detailed construction schedule must be submitted to the Engineer for approval before any construction starts, showing the proposed sequences of operation and the methods to be used for maintaining continued operations of existing facilities.
- E. Refer to SECTION 01500, TEMPORARY FACILITIES for additional requirements.

#### 1.24 SCHEDULE OF VALUES

- A. Submit a schedule of values for use in preparing the monthly progress payments described in the SECTION VI GENERAL CONDITIONS OF CONTRACT.
- B. An unpriced summary of the Engineer's tabulation of quantities – organized by site, major structure, and specification Division – is included as Appendix D to the contract documents. This is provided as a general guidance document for purposes of facilitating the distribution of the Contractor's lump sum pricing as presented in section 01025 in the development of the Schedule of Values.
- C. The schedule of values shall be prepared in conformance with the following format:
  - 1. General Condition
    - a. Subheadings
  - 2. All Structures
    - a. Subheadings by specification division and section
  - 3. General Site Work
    - a. Subheadings by specification division and section
  - 4. Unit Prices by Individual Items

5. Change orders by individual items shall be added as an approved by the Employer.

D. In addition to the above, each equipment line item in the schedule of values shall include the following breakdown (please note where percentages are indicated in the following that such percentages are merely to facilitate processing of payments and are not reflective of the precise value of the item).

1. Shop Drawings (10 percent of equipment value)

2. Equipment

3. Installation

4. Manufacturers' Checkout and Startup Assistance (2 percent of equipment value)

5. Equipment testing (10 percent of equipment value)

6. Manufacturers' Training of Contract Operations and Owner Personnel – including training materials preparation and Mongolian Translation (1 percent of equipment value)

7. Spare Parts (1 percent of equipment value)

8. Operation and Maintenance Manuals (1 percent of equipment value)

E. The schedule of values shall be submitted to the Engineer for review and approval at least 30 calendar days prior to the first progress payment request. The acceptable schedule of values shall be used for the duration of the Project.

F. Refer to SECTION 01025, MEASUREMENT AND PAYMENT for related information.

#### 1.25 OPERATION AND MAINTENANCE MANUALS:

A. Provide as specified in Section 01730 and herein.

#### 1.26 MANUFACTURER'S SERVICES:

A. Provide as specified in 01730 and herein.

B. Installation and Start-up

1. Make arrangements with each equipment supplier or manufacturer to furnish the services of a factory-trained service engineer who is specifically trained on the type of equipment being furnished for the sole purpose and use of the Owner and Engineer to assist during installation and start-up of all equipment and systems furnished by that supplier or manufacturer.

2. Minimum length of time specified for this service shall be exclusive of travel time and of correction of defects, testing, and training.

3. The manufacturer's engineer will verify, in writing, that the equipment has been installed and serviced so as to be acceptable to the equipment manufacturer in order that it will provide safe and efficient operation as intended by the Engineer and the manufacturer. The Engineer will provide a form entitled "Certification of Proper Equipment Installation" which is to be signed by the manufacturer's representative and the Contractor's representative for each piece of equipment.

C. Correction of Defects

1. Nothing specified herein shall provide relief of the responsibility of providing sufficient service to place all equipment or systems into satisfactory operation.
2. All time and materials needed to correct defective equipment shall be provided at no cost to the Owner.

D. Testing

1. Prior to testing, each equipment supplier or manufacturer shall furnish a written certification that the equipment is ready for operation. A copy of this certification shall be furnished to the Engineer.
2. Furnish the labor, tools, equipment, power, and clean water necessary to perform field-testing to determine that the supplied equipment including controls and alarms meets hydraulic, electric, mechanical and performance requirements. All tests shall be performed in the presence of the Engineer.

E. Training

1. Wherever called for in the Specifications, have each equipment supplier or manufacturer furnish the services of a fully qualified field service engineer to provide operator training in the complete operation and maintenance of all equipment furnished by that supplier or manufacturer.
2. The minimum length of time specified for this service shall be exclusive of travel time and shall follow and be exclusive of installation and start-up, correction of defects and testing.
3. Schedule training sessions in conjunction with and as approved by the Engineer. This training will be witnessed and verified by a representative appointed by the Engineer. The Engineer has the right to reject the training by the equipment supplier or manufacturer and to require additional training. The items addressed by the training session shall include, but not be limited to, system description, system operation, system disassembly and reassembly, lubrication, routine maintenance, corrective maintenance, use of operation and maintenance manual, system troubleshooting and ordering of spare parts.
4. The Engineer will provide a form entitled "Verification of Manufacturer's Equipment Training" which is to be signed by all parties at the completion of each training session.

### 1.27 SPARE PARTS:

- A. Provide as specified in 01730 and herein.
- B. Spare parts for all equipment shall be supplied to the Owner as specified. Spare parts shall be individually protected and packaged in a suitable container for long-term storage with the contents therein properly identified on the outside of the container.
- C. The Engineer will provide a form entitled "Spare Parts Inventory" which is to be fully completed and submitted to the Engineer for each piece of equipment requiring spare parts.

### 1.28 SPECIALTY TOOLS:

- A. Provide as specified in 01730 and herein.
- B. Any specialty tools required for the adjustment, operation and/or maintenance of any equipment included in the Work shall be furnished with the respective equipment.

### 1.29 STATUTORY REQUIREMENTS IN GENERAL:

- A. Owner and Contractor recognize that other rights, duties, and obligations with respect to public construction contracts are also provided by statute, notwithstanding the fact that they may not be specifically enumerated herein. Accordingly, any provisions required by statute to be included in this contract shall be deemed to be so included as though fully set forth herein. However, compliance with a statute does not diminish the Contractor's responsibilities hereunder.
- B. Contractor shall keep fully informed of all existing and future State and Federal Laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same and of all provisions required by law to be made a part of this Contract, all of which provisions are hereby incorporated by reference and made a part thereof.
- C. If any discrepancy or inconsistency is discovered in the Contract Documents for this Work in relation to any such law, ordinance, regulation, order or decree, report the same to the Engineer in writing. Contractor shall, at all times, observe and comply with, and cause all agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the Owner and Engineer and all of its and their officers, agents, and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by itself or its employees or subcontractors.
- D. All materials furnished, and Work done shall comply with all State and Federal laws and regulations.

### 1.30 RELATION OF SEWER MAINS TO WATER LINES:

- A. Horizontal Separation



1. Whenever possible, sewers should be laid at least 300 cm (10 ft), horizontally, from any existing or proposed water mains.
2. Should local conditions prevent a lateral separation of 300 cm (10 ft), a sewer may be laid closer than (10 ft) to a water main if:
  - a) It is laid in a separate trench;
  - b) It is laid in the same trench with the water mains located at one side on a bench of undisturbed earth; and
  - c) In either case the elevation of the crown of the sewer is at least 18 inches below the invert of the water main.

#### B. Vertical Separation

1. Whenever sewers must cross under water mains, the sewer shall be laid at such elevation that the top of the sewer is at least 5.5m (18 in) below the bottom of the water main. When the elevation of the sewer cannot be buried to meet the above requirement, the water main shall be relocated to provide this separation or reconstruction with slip-on or mechanical-joint cast-iron pipe, or prestressed concrete cylinder pipe for a distance of 10 feet on each side of the sewer. One full length of water main shall be centered over the sewer so that both joints will be as far from the sewer as possible.
2. When a sewer crosses above a water main, the following measures will be taken:
  - a) Both pipes will be encased in concrete for a distance of 300 cm (10 ft) on either side of the crossing; or
  - b) The sewer will be encased in concrete and the water main will be constructed of mechanical joint ductile iron pipe for a distance of 300 cm (10 ft) on either side of the crossing.

#### C. Special Conditions

1. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the water main shall be constructed of slip-on or mechanical-joint cast-iron pipe or prestressed concrete cylinder pipe and the sewer constructed of mechanical-joint cast-iron pipe and both services shall be pressure tested to assure water tightness.

### 1.31 UTILITY COORDINATION:

- A. Contractor shall be responsible for contacting and coordinating with utility companies prior to commencing work in the area of utilities.
- B. Special requirements may be necessary for work in the vicinity of some utilities and easements. Requirements may include but are not limited to the following; surface marking of crossings and easements, temporary fencing, temporary pipe support, additional padding or steel plates for heavy equipment, and coordination with utility field personnel.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION – Not Used

END OF SECTION

SEE FOLLOWING FORMS

1. Verification of Manufacturer's Equipment Training
2. Operation and Maintenance Manual Review Checklist
3. Spare Parts Inventory
4. Certification of Proper Equipment Installation

## VERIFICATION OF MANUFACTURER'S EQUIPMENT TRAINING

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Training:	
Instructor(s):	
Title:	
Representing:	
Facility Staff in Attendance	
AECOM Representative(s):	
Contractor's Representative(s):	
___ System Description	___ Corrective Maintenance
___ System Operation	___ Use of Manufacturer's Manual
___ System Disassembly and Reassembly	___ Ordering Spare Parts
___ Lubrication	___ Other
___ Routine Maintenance	
I have performed the training described above and concur with this verification.	
Witnessed by:	Manufacturer's Instructor Signature

Title	Date	Title	Date

## OPERATION AND MAINTENANCE MANUAL REVIEW CHECKLIST

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Equipment Transmittal No.:	
O&M Manual Transmittal No.:	
1.	Correct number of copies of Operation and Maintenance Manual Supplied
2.	General
	a. Manual Customized
	b. Manual contains information on complete system (design, installation, operation and maintenance instructions)
	c. All material contained in manual is legible
	d. Permanent Binder and Labeled
	e. Index
3.	Contact Information
	a. Name, address, and telephone number of manufacturer
	b. Name, address, and telephone number of nearest source of replacement parts and service
4.	Equipment Information
	a. Equipment drawings, schematics, plates, and layouts
	b. Equipment Performance Curves
	c. Lubrication Schedule
	d. Maintenance Schedule
	e. Trouble Shooting Guide



		f. Parts List (part manufacturer, catalog number, etc.)
		g. Current Part Costs
		h. Recommended Spare Parts
		I. Special Tools Required
Remarks:		

**SPARE PARTS INVENTORY**

CLIENT:		ENGINEER:			
PROJECT:		CONTRACTOR:			
Equipment:					
Specification Section:					
AECOM Representative(s):					
Part Number	Part Description	Quantity	Owner	Initial Date	Initial Date


## CERTIFICATION OF PROPER EQUIPMENT INSTALLATION

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Equipment Inspection:	
Manufacturer's Representative(s):	
Representing:	
Contractor's Representative(s)	
Equipment Installation	
____ Equipment Mounting / Supports	____ Lubrication
____ Safety (guards and/or signage)	____ Calibration
____ Electrical System	____ Spare Parts
____ Instrumentation and/or Control System	____ Other _____
Corrective Action Required:	
Corrective Action Completed:	

I hereby certify that the above noted equipment is ready for safe and efficient operation.	
Witnessed by:  _____  Contractor's Representative Signature  Date: _____	Certified by:  _____  Manufacturer's Representative Signature  Date: _____

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## SECTION 01030 (CP-3)

## SPECIAL REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The Work of this section includes the furnishing of all labor, materials, tools and equipment required to perform Special Requirements as specified herein.
- B. Attention is directed to the SECTION VI – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for Work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT and as follows:
  - 1. All costs associated with locating, maintaining location marks, excavation, refilling, compaction, repairing utilities broken due to the Contractor's operations, time delays relative to existing utilities and all other Work associated with utilities shall be included for payment under the applicable pipe laying item included in PART I – BIDDING PROCEDURES.
  - 2. All costs associated with the legal disposal of excess materials shall be borne by the Contractor.
  - 3. No additional payment will be made for corrective work associated with furnishing and installing bedding materials for refill of excavations carried to grades lower than specified. If inadequate dewatering methods cause softening of subgrade areas, then remove the unsuitable material and replace with common fill at the Contractors cost.
  - 4. No payment will be made for temporary shoring of trench walls utilizing trench boxes and/or steel plates. Where timber or steel sheeting is used and is not specified to be paid for separately and ordered left in place by the Engineer, the Contractor has the option of leaving it in or removing it after it has been cut off 300 mm (1 ft) above the top of the pipe.
  - 5. Pay all fees for permits associated with blasting operations. Unauthorized excavations in rock, or excavations made beyond or below the specified limits shall be refilled and compacted with common fill and shall be borne by the Contractor. Perform blasting operation(s) in such a manner that no existing utilities are disturbed. All damage to existing utilities or roadway surfaces outside the trench limits caused by the Work of the Contractor or its Subcontractor(s) shall be repaired and/or replaced immediately and shall be borne by the Contractor.
  - 6. No additional payment will be made for the relocation and/or support of any obstruction encountered along the line of Work.

7. Testing, and jetting of trenches utilizing the Owner's (USUG's) water system may be available, however the Owner (USUG) does not guarantee that its water supply will be available at any time during the duration of the Project. Contractor is responsible for making all arrangements and gathering necessary permissions from the Owner's (USUG's) water district for use of water. Use of water shall be at the Contractor's expense. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
8. Provide detailed plan(s) to the Owner and/or the Road Development Department of Municipality of Ulaanbaatar City for all proposed detours and/or partial roadway closings made necessary by the Work. Obtain written approval for all proposed detours and/or partial roadway closings prior to the start of Work. No payment will be made for Work performed in areas of the Project that require an approved traffic management plan until it has been secured.
9. All costs associated with repairing settlement of trenches shall be borne by the Contractor.
10. All costs associated with meeting the requirements of all permits shall be borne by the Contractor and shall be included for payment under the applicable items included in PART I – BIDDING PROCEDURES.

#### 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

#### 1.04 SUBMITTALS:

- A. Submit to the Engineer for approval, shop drawings, certificates of compliance and/or catalog cuts for all items to be furnished under this Contract. All submittals shall be provided in accordance with SECTION VI, GENERAL CONDITIONS OF CONTRACT and SECTION 01300, SUBMITTALS.
- B. Digital Videodisc Recording
  1. Prior to the start of construction, video record, in color, the entire Project site(s) in the presence of the Engineer. Video recordings shall be in digital videodisc (DVD) format. Particular attention shall be made to the existing condition of roadway surfaces, curbing, berms, sidewalks, driveways, property bounds, landscaped areas, and any other items that might be affected by the Work.
  2. Video recordings shall be of excellent quality including clear and concise audio descriptions of the existing site(s) conditions. A copy of the first completed video recording shall be furnished to the Engineer, prior to the start of construction, in order to establish the requirement for visual and audio quality. Two (2) copies of all video recordings shall be provided to the Engineer. Any recordings furnished which, in the opinion of the Engineer, are of poor quality or incomplete, shall be redone at no additional cost to the Owner.

3. Video recordings shall be made by the Contractor in the presence of the Owner/Engineer.
4. No construction activities shall commence until the video recordings have been completed, submitted to the Engineer and approved by the Engineer.

C. Health and Safety Plan

1. Prior to the start of construction, prepare and submit a site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site and the requirements of Article 6.7 of the General Conditions. Work may not proceed at the project site until the Contractor's Health and Safety Plan has been received by the Engineer.
2. Contractor shall be cognizant of the minimum standards norms set forth as follows:
  - a. MNS 4990:2015 Labour Safety. Labour Environment. Hygiene requirements.
  - b. MNS 5002:2000 Labor Safety, General Requirements for noise normative and safety operation.
  - c. MNS 12.1.06:1988 Labor Safety Standard System. Extreme high noise. General Requirements for safety operation.
  - d. MNS 4931:2000 Protective means. General requirement, classification.
  - e. MNS 4968:2000 Occupational Safety and Health. Production processing general requirements.
  - f. MNS 4969:2000 Labor Safety and Sanitary. Training Organization, basic regulation.
  - g. BNbD 12-01-04 Regulation of Labor Safety for Construction Industry. Part I. General Requirements
  - h. BNbD 12-04-06 Regulation of Labor Safety for Construction Industry. Part I. Safety for Technical Sa
  - i. BD 12-10-05 Safety guidelines to be followed for construction and installation works.
  - j. MNS OSHAS 18001:2012 Occupational Health and Safety Management System.
  - k. Labour code of Mongolia
  - l. Law of Mongolia on Toxic Hazardous Chemicals
  - m. IFC Environmental, Health and Safety Guidelines
3. The Health and Safety Plan shall include, but not be limited to the following:

- a. Identification of Contractor's Site Safety Officer and Accident Prevention Officer.
  - b. Identification of hazards and risks associated with the Project.
  - c. Contractor's standard operating procedures, including personnel training and field orientation.
  - d. Respiratory protection training requirements.
  - e. Levels of protection and selection of equipment procedures.
  - f. Type of medical surveillance program.
  - g. Personal of hygiene requirements and guidelines.
  - h. Zone delineation of the Project site.
  - i. Site security and entry control procedures.
  - j. Field monitoring of site contaminants.
  - k. Contingency and emergency procedures.
  - l. Listing of emergency contacts.
4. The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's Health and Safety Plan.
  5. All Employees shall be provided with personal protective equipment (PPE) that meets the standards on accordance with the Mongolian safety and health law.
  6. The contractor shall notify the Owner, Engineer and MCC within 24 hours or as soon as reasonably possible after the occurrence of any accident which has resulted in damage or loss or property, disability or loss of human life, or which could be reasonably foreseen to have a material impact on the environment and shall submit a report to the Owner, Engineer, and MCC no later than 7 days after the occurrence of such an event.

#### D. Emergency Action Plan

1. Prior to the start of construction, prepare and submit a site-specific Emergency Action Plan which includes consideration of all known and potential accidents, spills and leaks of pollutants and hazards at the site. Work may not proceed at the project site until the Contractor's Emergency Action Plan has been received by the Engineer.
2. The Emergency Action Plan shall include, but not be limited to the following:
  - a. Identification of hazards and risks associated with the Project.
  - b. Identify preventative measures to be taken to avoid accidents and spillage of petroleum products and other pollutants. In the event of any spillage, identify

remedial action to be taken in accordance with a contingency action drawing or plan approved by the Engineer.

- c. Contractor's standard operating procedures, including personnel training and field orientation.
- d. Levels of protection and selection of equipment procedures.
- e. Field monitoring of petroleum products and potential pollutants.
- f. Contingency and emergency procedures.
- g. Listing of emergency contacts.

#### E. Hazardous Waste Management Plan

1. The Contractor shall obtain all information necessary to be fully aware of all potential exposures to hazardous waste materials and physical or biological agents in the performance of the Work. Prior to the start of construction, prepare and submit to the Engineer a site-specific Hazardous Waste Management Plan. The Contractor shall provide to its employees, Subcontractors and Third Parties, all information and training on the nature of these potential hazards as required by Local Laws or Regulations, regardless of the source of such hazards.
2. Certain chemical and physical agents (*i.e.*, asbestos, PCB's, radiation sources, etc.), are specifically regulated by Mongolian and/or Local agencies. When the Work involves a potential exposure to any such hazards, the Contractor shall assure compliance with all of those specific regulations. If spills, releases, disposal or exposure occur which may require reporting to regulator agencies, the Contractor shall notify the Owner immediately of the nature of the incident.
3. The Contractor's Hazardous Waste Management Plan must include as a minimum, specific provisions relative to:
  - a. The location of potential hazards.
  - b. The potential adverse health effects posted by such hazards.
  - c. Proper safe work practices to prevent or reduce potential exposure.
  - d. Proper protective measures and equipment required.
  - e. Proper use of protective equipment.
  - f. Proper response to exposure incidents.
  - g. Proper disposal of hazardous materials.
4. The Contractor shall provide all personal protective equipment to its employees required by the nature of the hazard. Such protective equipment must include at least the following items:

- a. NIOSH-approved respirator protection equipment (for dusts, mists, fumes, gasses, etc.).
- b. Hearing protection (plugs, muffs, etc.).
- c. Protective clothing (chemical goggles, gloves, resistant clothing, etc.).

F. Utilize the Shop Drawing Transmittal Forms supplied by the Engineer for all required submittals.

#### 1.05 PRODUCT HANDLING:

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage and shall be covered to prevent exposure to adverse conditions prior to installation.

#### 1.06 DESIGN CRITERIA:

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

#### 1.07 SPECIFICATIONS AND DRAWINGS:

- A. All Work shall conform to these specifications and the accompanying drawings entitled:

### **MCA MONGOLIA**

### **BULK WATER SYSTEM EXPANSION**

Dated ## consisting of ## sheets, all made by the Engineer, on file with the Owner, and any changes, drawings, plans, and directions that may be furnished from time to time by the Engineer.

#### 1.08 COMMENCEMENT AND PROGRESS OF WORK:

- A. Prior to the start of construction, the Owner and the Contractor shall obtain a permit for the commencement and execution of the work from the Urban Planning and Development Department.
- B. Promptly start and continue actual construction Work under this Contract with the necessary equipment to properly execute and complete the Work in the specified time. No cessation of construction activities will be allowed without the written approval of the Owner.



- C. Furnish to the Engineer a progress schedule for the Work prior to the start of construction.

#### 1.09 DETOURS AND ROAD ACCESSIBILITY:

- A. Contact the responsible heads of the Municipality Road Development Department of Municipality Ulaanbaatar City in order to obtain all necessary permits and determine the requirements with regards to traffic control.
- B. There are no guarantees that total roadway closures will be permitted. Incorporate into the construction schedule the ability to maintain one (1) lane of traffic at all times during the execution of the Work and complete the Work within the Completion date. Where the roadway under construction is the only means of vehicular access to a particular area provide continual access to the area for residents and emergency vehicles.
- C. Wherever detours are permitted, the size, construction and location of signs shall conform to local and state requirements and/or standards. Detour routes shall be adequately posted to assist the motorist to return to the normal route of travel for the duration of the Work and for a minimum of two (2) weeks prior to the start of construction in the areas of the Project affected by the Work.

#### 1.10 CHANGE IN AMOUNT OF WORK:

- A. The Owner reserves the right to increase or decrease the amount of any item of the Work listed as may be found desirable or necessary during the carrying out of this Contract and the unit prices included in PART I – BIDDING PROCEDURES shall apply without change to such variation in the quantity of each of the Bid items to the extent provided by law.
- B. Based on the actual work required, the increase or decrease in the quantity of any bid item of the Work included in PART I – BIDDING PROCEDURES shall apply without changes to the unit prices.

#### 1.11 SCOPE OF WORK AND SEQUENCE OF CONSTRUCTION:

- A. The Work to be done under this Contract consists of the construction of the Conveyance Facilities as specified and/or as shown on the Contract Drawings. Refer to SECTION 01010, SUMMARY OF WORK.
- B. For the protection of life and property all backfilling operations shall follow closely behind pipe laying. Insure that no excavation is left open, unguarded, or water filled during any period of time when Work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other Work areas.
- C. The Owner reserves the right to schedule the Work at any location within the Project area. At the same time the Owner may schedule the suspension of Work at any location.
- D. The Work of this Contract may require existing utilities to be bypassed, removed and relaid. The Contractor shall pay for all costs associated with this Work at no additional cost to the Owner except as specified in SECTION 01025, MEASUREMENT AND PAYMENT.

- E. The Owner has obtained various permits for this Project, which are included as APPENDIX C Meet all requirements/conditions of these permits during the construction of this Project. All costs associated with this Work shall be borne by the Contractor and included in the prices bid under the applicable items of PART I – BIDDING PROCEEDURES
- F. Pre-blasting of ledge is not allowed on this Project. No payment will be made for ledge removal on this Project in areas where pre-blasting has occurred.
- G. All damage to existing utilities, roadways, and the like shall be repaired and/or replaced by the Contractor as approved by the utility company and shall be borne by the Contractor.
- H. The control of dust shall be accomplished by the application of clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the control of dust shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner. The use of calcium chloride to control dust is not allowed.
- I. The compaction of trenches shall be accomplished by mechanical compaction and/or jetting. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for jetting of trenches shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
- J. The testing of tanks and/or pipelines shall be accomplished by using clean water. The Contractor is responsible for making all arrangements and gaining necessary permissions from the Owner to utilize the Owner's (USUG's) water system. However, the Owner does not guarantee that water will be available at any time during the duration of the Project. Water required for the testing of tanks and/or pipelines shall be provided by the Contractor at no additional cost to the Owner. All necessary piping, hoses, fittings, and the like shall be provided by the Contractor and the costs shall be borne by the Contractor. All water shall be metered, and the use of backflow prevention device(s) shall be required as approved by the Owner.
- K. Except for an emergency condition as approved by the Owner in writing, premium wages will not be paid for Work performed on Sunday, holiday or workdays longer than eight (8) hours. All costs incurred by the Owner caused by the Contractor's Work performed on Sunday, holiday or workdays longer than eight (8) hours shall be borne by the Contractor which will be deducted from monthly payment requests.
- L. No construction activity shall be allowed on the Project for two working days prior to the following dates:

- New Year's Day - January 1
- Tsagan Sar – Defined day in February, usually the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> day of spring month under lunar calendar.
- International Womans' Day – March 8
- Buddha Day- Fifteenth Day of first summer month under lunar calendar
- Childrens' Day – June 1
- National Naadam Holiday – July 11 - 15
- Great Chingis Khaan Birthday – First day of first winter month under Lunar calendar.
- State Proclamation Day – November 26
- Independence Day – November 29

All construction equipment and materials not incorporated in the Work to date shall be removed from the Work areas where construction activity is ceased. All excavations shall be backfilled and paved as specified and/or directed by the Engineer. Incorporate this requirement into the Project Schedule. Failure to comply with this requirement will result in no payment for work performed.

- M. The Contractor shall secure use of space that they have legal access to for the temporary buildings specified under SECTION 01500, TEMPORARY FACILITIES. The temporary buildings shall not be placed along the edge of roadways. The Contractor shall be responsible for clearing, grubbing, grading, providing of grading materials, permits, and full restoration of the temporary building location(s).

#### 1.12 EXISTING UTILITIES:

- A. The location and size of existing sewers, drains, culverts, water mains, gas mains, cables, service pipes, and other utilities shown on the Contract Drawings, were obtained from the results of surveys and existing records and are shown as approximate only, to guide the Bidders in the preparation of their Bid. The various utility companies will determine the location and depth of existing utilities by marking them out upon the ground and by experimental excavations by the Contractor prior to and as the Work progresses. The Contract Drawings do not show the exact location and depth of all utilities, nor do they show all utilities or the number of lines for each utility that may be encountered.
- B. Assume that there are existing utility connections to each and every building or structure along the line of Work, whether they appear on the Contract Drawings or not. Notify the proper utility companies and obtain and preserve the marked location(s) of all existing utilities that may be encountered along the line of Work, until such time as such markings are no longer required.
- C. Experimental trench excavations are to be made prior to commencing pipe laying operations. Excavate by hand as necessary in advance of the trenching equipment to determine the exact location and depth of each utility that may be encountered. Excavation equipment shall not be used within three (3) feet of the utility to be crossed. Continue to excavate by hand around these utilities after ascertaining their exact location and depth.

- D. All utilities interfered with or damaged shall be replaced and/or repaired immediately. Carefully bed, tamp and fully consolidate refill material around and under all existing utilities encountered or crossed unless otherwise specified as approved by the Engineer.
- E. Protection of all existing utilities in the vicinity of the Work and the assurance of uninterrupted service from existing utilities throughout construction is the responsibility of the Contractor.
- F. In the event that the Contractor's Work results in damages to existing utilities, provide all necessary materials, equipment and labor necessary to satisfactorily repair damaged utilities immediately at no cost to the Owner.
- G. Notify the Water Utility 24 hours prior to connecting to and/or bypassing any existing water main, or as required by the utility. Do not operate any existing water system valves. All such operations shall be coordinated with and performed by Water Utility personnel.

#### 1.13 VISITS TO THE SITE(S):

- A. Before submitting a Bid, visit the site(s) to examine existing conditions and become thoroughly acquainted with the effort required to perform the Work.
- B. Study the Contract Documents and compare the same with the information gathered during examination of the site(s), as no extra compensation will be authorized for extra Work caused by unfamiliarity with the site(s) and/or Contract Documents or the conditions peculiar to this Project.

#### 1.14 DISPOSAL OF EXCESS MATERIAL:

- A. All pavement road base, surplus suitable material removed from the excavations, loam not required for re-use in the Work shall be legally disposed of by the Contractor.
- B. Legally dispose of all unsuitable material removed as part of the Work.

#### 1.15 TECHNICAL SPECIFICATIONS:

- A. Where reference is made to MNS, ISO, MNS ASTM, MNS AASHTO, MNS EN, CCfFSU (SNIP), CCM (BNbD), CR BD, ASTM, AWWA and AASHTO specifications or other associations, it is understood that the latest revisions as of the date of the Contract Documents shall apply.

#### 1.16 PERMITS, FEES AND BONDS:

- A. Obtain and comply with all required permits, pay all fees and provide all bonds necessary to complete the Work as specified. Be solely responsible for performing any necessary acts and providing any materials required in order to comply with any and all terms and conditions set forth in any permits and licenses. Refer to APPENDIX C for all permits, which have been obtained for the Project. The Owner has not obtained all permits and licenses required for this Project. The Contractor shall obtain and pay for any other permits required to complete the Project including but not limited to Road Opening Permit, Blasting, and Phase II General Stormwater Permit for small construction projects.

#### 1.17 NOTIFICATION OF CONSTRUCTION:

- A. At least 5 business days prior to initiating excavation Work, notify the following entities, whose facility is located in the excavation zone, in writing, of where and when excavation(s) are scheduled and request their engineer to be present at the site during excavation.
  - 1. Municipality Road Development Department
  - 2. USUG
  - 3. Communication Companies
  - 4. Power Companies

#### 1.18 BOUNDS AND PROPERTY MARKERS:

- A. Prior to initiating construction, engage an independent Registered Land Surveyor (in the State where the Project is located) to provide permanent reference points for all bounds and property markers along the line of the Work that may be disturbed during construction. Submit copies of all ties to the bounds and property markers to the Engineer prior to excavation at the site(s).
- B. Any bounds or markers disturbed shall be replaced utilizing the services of a Professional Land Surveyor in the State where the Project is located. The cost of replacing markers disturbed by the Contractor's operations shall be at the Contractor's expense.

#### 1.19 TWENTY-FOUR HOUR EMERGENCY SERVICE:

- A. Maintain a 24-hour, 7-day a week telephone service. The Contractor's emergency personnel and equipment shall be within 30 minutes travel time to the Project site(s) in order to handle emergency requirements such as, but not limited to, settled trenches, clogged drains, and rain damage and/or any other emergency situation relating to the Contractor's Work. A list of the personnel and their telephone numbers, pager numbers, and cell phone numbers, shall be submitted to the Engineer, the Owner and to the local Police and Fire Departments.
- B. This requirement shall apply for the duration of the Project and shall be updated as necessary. This list shall be submitted on the Contractor's letterhead and shall state that should an emergency arise during the implementation of the Project, these people are to be contacted. Submit this letter to the Engineer prior to initiating construction.

#### 1.20 HOURS OF OPERATION:

- A. The Contractor, including all subcontractors, materialmen, and all other relating to this Project, shall conform to the following Work schedule.
  - 1. No outdoor activity on or adjacent to the site will be permitted before 7:00 a.m. or after 5:00 p.m., unless other arrangements are made with the Owner.
  - 2. No outdoor activity shall take place on Sundays, legal holidays recognized by the Owner, and the days preceding legal holidays as noted in herein, except for emergency conditions, which, if practical, shall be reviewed and approved by the Owner.

### 1.21 DISPOSAL OF DEBRIS:

- A. During the prosecution of the Work, maintain the Project site(s) and adjoining areas in a neat and orderly manner and eliminate the accumulation of construction debris. A rubbish container shall be kept at the Project site(s) at all times and be emptied as required to prevent odors and vermin.
- B. Store and remove all debris from the Project site(s) and legally dispose of the debris in accordance with federal/state/local regulations. Should the Contractor neglect or refuse to maintain the Project site(s) free of accumulated debris, the Owner reserves the right to have the service performed by others and cost thereof deducted from monthly progress payment requests.
- C. At the conclusion of the Work, remove and legally dispose of any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from construction operations, and leave the entire Project site(s) of the Work in a neat and orderly condition.

### 1.22 RECORD DRAWINGS:

- A. Throughout the course of completing the Work, continually maintain a set of record drawings that incorporate all approved changes made by the Contractor and all subcontractors to the Drawings included in the executed Contract between the Owner and the Contractor. Clearly and concisely mark up the individual Drawings and/or incorporate sketches that show approved changes made during the execution of the Work. Following completion of the Work, incorporate all approved changes electronically into one (1) complete set of record drawings. Record drawings shall be complete in every way and shall show the full extent of the executed Work. Special attention shall be given to concealed Work.
- B. Change Orders, Addenda items and field changes shall be included where applicable. Additional specific requirements relative to record drawings may be called for in the individual sections of the Specifications. Submit a review copy to the Engineer for approval and make any revisions required by the Engineer in order to make the record drawings complete. After acceptance by the Engineer, deliver a full scale reproducible hard copy and a compact disk with Auto Cad files of the record drawings to the Engineer.
- C. Tie cards 22 cm x 28 cm (8 ½ inches by 11 inches) of all exterior buried utilities such as but not limited to piping, tubing, conduits, wye/tee connections, fittings, cleanouts, and valves, shall be fully dimensioned both horizontally and vertically, so that the exterior buried utilities can be located in the field. A minimum of three (3) ties shall be provided for each item requiring a tie. Submit the tie cards on a weekly basis or as directed by the Engineer. If, in the opinion of the Owner and/or Engineer, insufficient data is provided to properly locate the exterior buried utilities, uncover the buried utilities and perform the necessary measurements and provide updated tie cards at no additional cost to the Owner.
- D. An electronic copy of the Engineer's Auto Cad files shall be made available to the Contractor for the purpose of completing the required computer drafted record drawings.



### 1.23 INITIAL OPERATION OF NEW FACILITIES:

- A. Operation and maintenance manuals shall be submitted to the Engineer in accordance with SECTION VI GENERAL CONDITIONS OF CONTRACT at least one (1) month prior to the scheduling of any manufacturers training.
- B. Perform pressure and/or leakage testing of all pipelines, storage tanks and basins prior to prestart-up testing of all equipment and/or systems. Provide the initial filling of all pipelines, storage tanks and basins with potable water as necessary for start-up of individual systems throughout the facility.
- C. Initial start-up of new equipment and/or systems shall not commence until all of the manufacturers services, checkout, and training have been completed as approved by the Engineer.
- D. Perform an 8 hour or less, if approved by the Engineer, prestart-up test of all individual equipment prior to incorporating equipment into their appropriate systems.
- E. Perform an 8 hour or less, if approved by the Engineer, prestart-up test of all systems prior to conducting the performance test of the facility.
- F. Provide all labor, power, chemicals, operations and maintenance from the initial start-up of the individual equipment and systems until the final performance test of the facility is accepted by the Owner as substantially complete at no additional cost to the Owner.

### 1.25 CONTINUOUS OPERATING CRITERIA:

- A. Conduct operations in such a manner and sequence that shall neither result in a disruption of the amenities, nor interfere with the functional organization and workings of existing facilities.
- B. Furnish, install and operate any piping, equipment and appurtenances necessary to provide the temporary services, facilities, and bypasses required during construction including, but not limited to, bypass pumping, flow barriers and diversions.
- C. The Owner will operate and maintain all existing systems and equipment. Notify and coordinate with the Owner all temporary modifications to existing facilities operations required for construction within, or interfacing with, the existing facilities. Operate and maintain all proposed facilities until such time as the Owner accepts them.
- D. A carefully planned and detailed construction schedule must be submitted to the Engineer for approval before any construction starts, showing the proposed sequences of operation and the methods to be used for maintaining continued operations of existing facilities.
- E. Refer to SECTION 01500, TEMPORARY FACILITIES for additional requirements.

### 1.26 OPERATION AND MAINTENANCE MANUALS:

- A. Provide as specified in Section 01730 and herein.
- B. All elements and components of the equipment or system shall be included in the Manuals.

1. Any malfunction of, or damage to the equipment or system resulting from incomplete or incorrect instructions in the Manuals for the guarantee period specified elsewhere in this specification shall be repaired and/or replaced at no additional cost to the Owner.
  2. Any and all capabilities for specified future modification; alteration or reconfiguration shall be completely indicated and described within the Manual.
  3. The manuals shall contain the name, address, business telephone numbers and service telephone numbers for the manufacturer and its local distributor/representative.
  4. Each Manual for each item of equipment or system shall be bound separately in a permanent binder.
- C. The form entitled "Operation and Maintenance Manual Review checklist" shall be utilized and submitted for each specification section to insure completeness of the manual. The form is attached to the end of this section.
- D. The Engineer has the right to reject the Manuals submitted as being unsatisfactory or to require the submittal of additional information. The new Manuals or additional information shall be submitted no later than 30 days following notification by the Engineer.

#### 1.27 MANUFACTURER'S SERVICES:

A. Provide as specified in 01730 and herein.

##### B. Installation and Start-up

1. Make arrangements with each equipment supplier or manufacturer to furnish the services of a factory-trained service engineer who is specifically trained on the type of equipment being furnished for the sole purpose and use of the Owner and Engineer to assist during installation and start-up of all equipment and systems furnished by that supplier or manufacturer.
2. Minimum length of time specified for this service shall be exclusive of travel time and of correction of defects, testing, and training.
3. The manufacturer's engineer will verify, in writing, that the equipment has been installed and serviced so as to be acceptable to the equipment manufacturer in order that it will provide safe and efficient operation as intended by the Engineer and the manufacturer. The Engineer will provide a form entitled "Certification of Proper Equipment Installation" which is to be signed by the manufacturer's representative and the Contractor's representative for each piece of equipment.

##### C. Correction of Defects

1. Nothing specified herein shall provide relief of the responsibility of providing sufficient service to place all equipment or systems into satisfactory operation.
2. All time and materials needed to correct defective equipment shall be provided at no cost to the Owner.

##### D. Testing

1. Prior to testing, each equipment supplier or manufacturer shall furnish a written certification that the equipment is ready for operation. A copy of this certification shall be furnished to the Engineer.
2. Furnish the labor, tools, equipment, power, and clean water necessary to perform field-testing to determine that the supplied equipment including controls and alarms meets hydraulic, electric, mechanical and performance requirements. All tests shall be performed in the presence of the Engineer.

E. Training

1. Wherever called for in the Specifications, have each equipment supplier or manufacturer furnish the services of a fully qualified field service engineer to provide operator training in the complete operation and maintenance of all equipment furnished by that supplier or manufacturer.
2. The minimum length of time specified for this service shall be exclusive of travel time and shall follow and be exclusive of installation and start-up, correction of defects and testing.
3. Schedule training sessions in conjunction with and as approved by the Engineer. This training will be witnessed and verified by a representative appointed by the Engineer. The Engineer has the right to reject the training by the equipment supplier or manufacturer and to require additional training. The items addressed by the training session shall include, but not be limited to, system description, system operation, system disassembly and reassembly, lubrication, routine maintenance, corrective maintenance, use of operation and maintenance manual, system troubleshooting and ordering of spare parts.
4. The Engineer will provide a form entitled "Verification of Manufacturer's Equipment Training" which is to be signed by all parties at the completion of each training session.

1.28 SPARE PARTS:

- A. Provide as specified in 01730 and herein.
- B. Spare parts for all equipment shall be supplied to the Owner as specified. Spare parts shall be individually protected and packaged in a suitable container for long-term storage with the contents therein properly identified on the outside of the container.
- C. The Engineer will provide a form entitled "Spare Parts Inventory" which is to be fully completed and submitted to the Engineer for each piece of equipment requiring spare parts.

1.29 SPECIALTY TOOLS:

- A. Provide as specified in 01730 and herein.
- B. Any specialty tools required for the adjustment, operation and/or maintenance of any equipment included in the Work shall be furnished with the respective equipment.

### 1.30 STATUTORY REQUIREMENTS IN GENERAL:

- A. Owner and Contractor recognize that other rights, duties, and obligations with respect to public construction contracts are also provided by statute, notwithstanding the fact that they may not be specifically enumerated herein. Accordingly, any provisions required by statute to be included in this contract shall be deemed to be so included as though fully set forth herein. However, compliance with a statute does not diminish the Contractor's responsibilities hereunder.
- B. Contractor shall keep fully informed of all existing and future State and Federal Laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same and of all provisions required by law to be made a part of this Contract, all of which provisions are hereby incorporated by reference and made a part thereof.
- C. If any discrepancy or inconsistency is discovered in the Contract Documents for this Work in relation to any such law, ordinance, regulation, order or decree, report the same to the Engineer in writing. Contractor shall, at all times, observe and comply with, and cause all agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the Owner and Engineer and all of its and their officers, agents, and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by itself or its employees or subcontractors.
- D. All materials furnished, and Work done shall comply with all State and Federal laws and regulations.

### 1.31 RELATION OF SEWER MAINS TO WATER LINES:

#### A. Horizontal Separation

- 1. Whenever possible, sewers should be laid at least 300 cm (10 ft), horizontally, from any existing or proposed water mains.
- 2. Should local conditions prevent a lateral separation of 300 cm (10 ft), a sewer may be laid closer than (10 ft) to a water main if:
  - a) It is laid in a separate trench;
  - b) It is laid in the same trench with the water mains located at one side on a bench of undisturbed earth; and
  - c) In either case the elevation of the crown of the sewer is at least 18 inches below the invert of the water main.

#### B. Vertical Separation

- 1. Whenever sewers must cross under water mains, the sewer shall be laid at such elevation that the top of the sewer is at least 5.5m (18 in) below the bottom of the water main.

When the elevation of the sewer cannot be buried to meet the above requirement, the water main shall be relocated to provide this separation or reconstruction with slip-on or mechanical-joint cast-iron pipe, or prestressed concrete cylinder pipe for a distance of 10 feet on each side of the sewer. One full length of water main shall be centered over the sewer so that both joints will be as far from the sewer as possible.

2. When a sewer crosses above a water main, the following measures will be taken:
  - a) Both pipes will be encased in concrete for a distance of 300 cm (10 ft) on either side of the crossing; or
  - b) The sewer will be encased in concrete and the water main will be constructed of mechanical joint ductile iron pipe for a distance of 300 cm (10 ft) on either side of the crossing.

C. Special Conditions

1. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the water main shall be constructed of slip-on or mechanical-joint cast-iron pipe or prestressed concrete cylinder pipe and the sewer constructed of mechanical-joint cast-iron pipe and both services shall be pressure tested to assure water tightness.

1.32 UTILITY COORDINATION:

- A. Contractor shall be responsible for contacting and coordinating with utility companies prior to commencing work in the area of utilities.
- B. Special requirements may be necessary for work in the vicinity of some utilities and easements. Requirements may include but are not limited to the following; surface marking of crossings and easements, temporary fencing, temporary pipe support, additional padding or steel plates for heavy equipment, and coordination with utility field personnel.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION – Not Used

END OF SECTION

SEE FOLLOWING FORMS

1. Verification of Manufacturer's Equipment Training
2. Operation and Maintenance Manual Review Checklist
3. Spare Parts Inventory
4. Certification of Proper Equipment Installation



## VERIFICATION OF MANUFACTURER'S EQUIPMENT TRAINING

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Training:	
Instructor(s):	
Title:	
Representing:	
Facility Staff in Attendance	
AECOM Representative(s):	
Contractor's Representative(s):	
___ System Description	___ Corrective Maintenance
___ System Operation	___ Use of Manufacturer's Manual
___ System Disassembly and Reassembly	___ Ordering Spare Parts
___ Lubrication	___ Other
___ Routine Maintenance	
I have performed the training described above and concur with this verification.	
Witnessed by:	Manufacturer's Instructor Signature

Title	Date	Title	Date

## OPERATION AND MAINTENANCE MANUAL REVIEW CHECKLIST

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Equipment Transmittal No.:	
O&M Manual Transmittal No.:	
1.	Correct number of copies of Operation and Maintenance Manual Supplied
2.	General
	a. Manual Customized
	b. Manual contains information on complete system (design, installation, operation and maintenance instructions)
	c. All material contained in manual is legible
	d. Permanent Binder and Labeled
	e. Index
3.	Contact Information
	a. Name, address, and telephone number of manufacturer
	b. Name, address, and telephone number of nearest source of replacement parts and service
4.	Equipment Information
	a. Equipment drawings, schematics, plates, and layouts
	b. Equipment Performance Curves
	c. Lubrication Schedule
	d. Maintenance Schedule
	e. Trouble Shooting Guide

		f. Parts List (part manufacturer, catalog number, etc.)
		g. Current Part Costs
		h. Recommended Spare Parts
		I. Special Tools Required
Remarks:		

**SPARE PARTS INVENTORY**

CLIENT:		ENGINEER:			
PROJECT:		CONTRACTOR:			
Equipment:					
Specification Section:					
AECOM Representative(s):					
Part Number	Part Description	Quantity	Owner	Initial Date	Initial Date




## CERTIFICATION OF PROPER EQUIPMENT INSTALLATION

CLIENT:	ENGINEER:
PROJECT:	CONTRACTOR:
Equipment:	
Specification Section:	
Date of Equipment Inspection:	
Manufacturer's Representative(s):	
Representing:	
Contractor's Representative(s)	
Equipment Installation	
___ Equipment Mounting / Supports	___ Lubrication
___ Safety (guards and/or signage)	___ Calibration
___ Electrical System	___ Spare Parts
___ Instrumentation and/or Control System	___ Other _____
Corrective Action Required:	
Corrective Action Completed:	

I hereby certify that the above noted equipment is ready for safe and efficient operation.	
Witnessed by:  _____  Contractor's Representative Signature  Date: _____	Certified by:  _____  Manufacturer's Representative Signature  Date: _____

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## SECTION 01046 (ALL CPs)

## CONTROL OF WORK

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The Work of this section includes all labor, equipment, tools, and materials necessary for the implementation of the Control of Work during the construction of the facilities.
- B. Attention is directed to the SECTION VII – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

## 1.04 SUBMITTALS – Not Used

## 1.05 DESIGN CRITERIA – Not Used

## 1.06 REFERENCED STANDARDS – Not Used

## PART 2 - PRODUCTS AND SERVICES – Not Used

## PART 3 - EXECUTION

## 3.01 FACILITY AND HOURS OF CONSTRUCTION:

- A. Furnish facility and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such facility appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the facility equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
- B. Normal construction activity shall take place only between the hours of 7:00 a.m. to 6:00 p.m., excluding Saturdays, Sundays, and legal holidays. Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner.

### 3.02 OCCUPYING PRIVATE LAND:

- A. The Contractor shall not (except after written consent from the proper parties) enter or occupy with workers, tools, materials, or equipment any land outside the rights of way or property of the Owner. A copy of the written consent shall be given to the Engineer.

### 3.03 PIPE LOCATIONS:

- A. Exterior pipelines will be located substantially as indicated on the Drawings, but the right is reserved to the Owner, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.
- B. Small interior piping is indicated diagrammatically on the Drawings, and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, so as not to interfere with equipment or access ways, and, in general, without diagonal runs.

### 3.04 DIMENSION OF EXISTING STRUCTURES:

- A. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

### 3.05 OPEN EXCAVATIONS:

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- C. The Contractor shall take precautions and provide barricades and fences to prevent animals from falling into open excavations. Monitor open excavations regularly and remove animals that may enter excavation daily.

### 3.06 TEST PITS:

- A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor at the direction of the Engineer. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineer.

### 3.07 INTERFERENCE WITH AND PROTECTION OF STREETS:

- A. The Contractor shall not close or obstruct any portion of a street, road, or private way including unimproved access ways without obtaining permits therefor from the proper authorities. If any street, road or private way including unimproved access ways shall be rendered unsafe by the Contractor's operations, it shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.
- B. Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefor.
- C. The Contractor shall, at least 24 hours in advance, notify the Traffic Police, Fire Department and City Road Department in writing, with a copy to the Engineer, if the closure of a street or road is necessary. Contractor shall cooperate with the Traffic Police Department in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

### 3.08 CARE AND PROTECTION OF PROPERTY:

- A. The Contractor shall be responsible for the preservation of all public and private property, religious hillock, and monuments and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Engineer.

### 3.09 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired using its forces and at its expense.
- B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.



- C. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the Total Price Bid in the Letter of Bid.
- D. If, in the opinion of the Engineer, permanent relocation of a Owner's utility is required, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid at the Contract unit prices, if applicable, or as extra work. If relocation of a privately owned utility is required, the Owner will notify the Utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and Utility, and shall have no claim for delay due to such relocation. The Contractor shall notify all utility companies in writing at least 72 hours (excluding Saturdays, Sundays, and Legal holidays) before excavating in any public way. The Contractor shall coordinate the removal and replacement of traffic loops and signals, if required for the performance of the work, at no additional cost to the Owner.

### 3.10 INSPECTION OF WORK AWAY FROM THE SITE:

- A. If work to be done away from the construction site is to be inspected on behalf of the Owner during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time so that the necessary arrangements for the inspection can be made.

### 3.11 COOPERATION WITHIN THIS CONTRACT:

- A. All firms or persons authorized to perform any work under this Contract shall cooperate with General Contractor and its Subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.
- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

### 3.12 CLEANUP AND DISPOSAL OF EXCESS MATERIAL:

- A. During the course of the work, the Contractor shall keep the site of its operations in as clean and as neat a condition as is possible. The Contractor shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.
- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor and its subcontractors shall comply with all applicable national and local laws, and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.
- C. The Contractor is advised that the disposal of excess excavated material in wetlands, stream corridors, and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by the Contractor, will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the Contractor will be required to remove the fill at its own expense and restore the area impacted.

3.13 CONTRACT CLOSEOUT:

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT and GENERAL CONDITIONS ARTICLE 10, EMPLOYERS TAKING OVER.

END OF SECTION

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## SECTION 01063 (CP-1)

## MISCELLANEOUS REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK:

- A. The Contractor shall conform to all miscellaneous requirements as herein specified.
- B. Attention is directed to the SECTION VI – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 TRAFFIC CONTROL:

- A. For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
- B. Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
- C. The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.

## 1.04 INTERFERENCE WITH EXISTING WORKS:

- A. The Contractor shall at all times conduct its operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work, which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

- B. The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.
- C. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting its operations to meet the above requirements.

#### 1.05 MAINTAINING FLOWS:

- A. It is essential to the operation of all existing utilities that there be no interruption in the service. To this end, the Contractor shall at his own expense, provide, maintain, and operate all temporary facilities such as necessary to maintain such services.
- B. The Contractor shall at his own cost, provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and shall immediately cart away and removal all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.

#### 1.06 PRELOADING AND LEAKAGE TESTING OF TANKS – Not Used

#### 1.07 BACKFILLING AGAINST STRUCTURES:

- A. Backfill shall not be placed against foundation walls until all interior floors have been placed and the concrete has attained design strength. This includes the floor level at grade or the next level above grade if no floor is within 610 mm (2 feet) of finished grade.
- B. Backfill shall not be placed against cantilever walls until the concrete has attained design strength.

#### 1.08 HYDRAULIC UPLIFT OF STRUCTURES:

- A. The Contractor shall be responsible for the protection of all structures against hydraulic uplift until such structures have been accepted finally by the Owner.
- B. In this regard, the Contractor is advised that all tanks when completed are designed to resist hydraulic uplift from groundwater up to the elevation indicated on the structural drawings when the structure is completed. The concrete slab bottoms shall be placed in the dry, with the use of wellpoints or other dewatering means to keep the water elevation sufficiently low to carry on the work.
- C. Buildings with basements are designed to resist hydraulic uplift from groundwater up to the elevation indicated on the structural drawings against the weight of the completed structure, including all masonry, structural steel frames and cladding.

#### 1.09 PRECAUTIONS AGAINST HYDROSTATIC UPLIFT DURING CONSTRUCTION:

- A. The Contractor shall maintain a low groundwater elevation in the vicinity of the structures until they are complete. In case of extremely high water during

construction of the structures, it may be necessary to flood the structures to maintain stable conditions.

#### 1.10 BURIED UTILITY WARNING AND IDENTIFICATION TAPE:

- A. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 75 mm (3 inches) minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED WATER PIPING BELOW (in both English and Mongolian) or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 300 mm (12 inches) below the top surface of earth or the top surface of the subgrade under pavements.

#### 1.11 PROTECTION AGAINST ELECTROLYSIS:

- A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. In areas not in contact with raw or potable water the insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

END OF SECTION



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## SECTION 01063 (CP-2, CP-3)

## MISCELLANEOUS REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK:

- A. The Contractor shall conform to all miscellaneous requirements as herein specified.
- B. Attention is directed to the SECTION VI – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 TRAFFIC CONTROL:

- A. For control of moderate traffic, the Contractor shall provide an adequate number of flagpersons employed at its own expense.
- B. Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor shall inform the Road Development Department of Municipality of Ulaanbaatar City, to direct traffic and to keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the contract.
- C. The employment or presence of traffic flagpersons, special officers, or police shall in no way relieve the Contractor of its responsibility or liability under the contract.

## 1.04 INTERFERENCE WITH EXISTING WORKS:

- A. The Contractor shall at all times conduct its operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work, which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

- B. The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.
- C. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting its operations to meet the above requirements.

#### 1.05 MAINTAINING FLOWS:

- A. It is essential to the operation of all existing utilities that there be no interruption in the service. To this end, the Contractor shall at his own expense, provide, maintain, and operate all temporary facilities such as necessary to maintain such services.
- B. The Contractor shall at his own cost, provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and shall immediately cart away and removal all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.

#### 1.06 PRELOADING AND LEAKAGE TESTING OF TANKS:

- A. Conduct preloading and leakage testing in accordance with section 03800.

#### 1.07 BACKFILLING AGAINST STRUCTURES:

- A. Backfill shall not be placed against foundation walls until all interior floors have been placed and the concrete has attained design strength. This includes the floor level at grade or the next level above grade if no floor is within 610 mm (2 feet) of finished grade.
- B. Backfill shall not be placed against cantilever walls until the concrete has attained design strength.

#### 1.08 HYDRAULIC UPLIFT OF STRUCTURES:

- A. The Contractor shall be responsible for the protection of all structures against hydraulic uplift until such structures have been accepted finally by the Owner.
- B. In this regard, the Contractor is advised that all tanks when completed are designed to resist hydraulic uplift from groundwater up to the elevation indicated on the structural drawings when the structure is completed. The concrete slab bottoms shall be placed in the dry, with the use of wellpoints or other dewatering means to keep the water elevation sufficiently low to carry on the work.
- C. Buildings with basements are designed to resist hydraulic uplift from groundwater up to the elevation indicated on the structural drawings against the weight of the completed structure, including all masonry, structural steel frames and cladding.

#### 1.09 PRECAUTIONS AGAINST HYDROSTATIC UPLIFT DURING CONSTRUCTION:

- A. The Contractor shall maintain a low groundwater elevation in the vicinity of the structures until they are complete. In case of extremely high water during construction of the structures, it may be necessary to flood the structures to maintain stable conditions.

#### 1.10 BURIED UTILITY WARNING AND IDENTIFICATION TAPE:

- A. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 75 mm (3 inches) minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED WATER PIPING BELOW (in both English and Mongolian) or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 300 mm (12 inches) below the top surface of earth or the top surface of the subgrade under pavements.

#### 1.11 PROTECTION AGAINST ELECTROLYSIS:

- A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. In areas not in contact with raw or potable water the insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

END OF SECTION

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## SECTION 01110 (ALL CPs)

## ENVIRONMENTAL PROTECTION PROCEDURES

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. Provide and compact bank-run gravel as indicated and specified.
- B. The work covered by this Section consists of furnishing all labor materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- C. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.
- D. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching, or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area. Specific requirements for erosion and sedimentation controls are specified in SECTION 01568, EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS.
- E. These Specifications are intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.
- F. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.
- G. Attention is directed to the SECTION VII – GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.



#### 1.04 SUBMITTALS – Not Used

#### 1.05 PRODUCT HANDLING – Not Used

#### 1.06 DESIGN CRITERIA:

- A. Comply with all applicable Government of Mongolia (GoM) laws and regulations concerning environmental pollution control and abatement.
- B. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectional acts and corrective action to be taken. Government of Mongolia (GoM) agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with Government of Mongolia (GoM) requirements. The Contractor shall, after receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

#### PART 2 - PRODUCTS – Not Used

#### PART 3 - EXECUTION

##### 3.01 IMPLEMENTATION:

- A. Prior to commencement of the work, meet with the Engineer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. Remove temporary environmental control features, when approved by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

##### 3.02 EROSION CONTROL:

- A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

##### 3.03 PROTECTION OF STREAMS, WETLANDS, AND SURFACE WATER:

- A. Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the

manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.

- B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan previously approved by the Metropolitan Professional Inspection Department. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer.
- D. Water being flushed from structures or pipelines after disinfection, with a Cl<sub>2</sub> residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.

#### 3.04 PROTECTION OF LAND RESOURCES:

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas approved in the Construction Permit.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. Removed trees shall be replaced as directed by the Engineer.
- E. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 25mm (1-in) in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

- F. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- G. The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands. Where the Works will be in floodplains, the Contractor shall take into consideration the rainy season period and take such measures as necessary to provide safe access to storage and temporary facilities. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- H. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in SECTION 01568 EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS or as approved by the Engineer.
- I. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

### 3.05 PROTECTION OF AIR QUALITY:

- A. Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the parameters for air pollution to exceed MNS 4585-2016 and other relevant standards, and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.
- E. All construction vehicles used for the completion of the work shall meet Government of Mongolia air quality emissions standards.

3.06 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION:

- A. During the life of this Contract, maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

3.07 NOISE CONTROL:

- A. The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with MNS 4585-2016 and other GoM regulations and US OSHA regulations.

3.08 CONTRACT CLOSEOUT:

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT.

END OF SECTION

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## SECTION 01500 (CP-1)

## TEMPORARY FACILITIES

## PART 1 - GENERAL

## 1.01 SCOPE

- A. The Work of this section includes the furnishing of all labor, tools, equipment and materials, performing all operations necessary to provide temporary facilities as specified herein and as directed by the Engineer.
- B. Specification Section 01500 covers the Field Office, equipment, and services provided by the Contractor for Engineer and Owner's use during the implementation of Work. Engineer and Owner shall return the Field Office, equipment, and supplies to Contractor at the completion of Contract, in used condition, wear and tear included. The Field Office shall be designed and constructed in accordance with the best practice of the industry and shall be installed in accordance with the manufacturer's recommendations.
- C. The Contractor shall pay for all costs of the Field Office, equipment, and services supplied under this Section.
- D. Contractor shall take full possession and control of the Field Office, equipment, and supplies after completion of this Contract.
- E. Temporary roadways and drilling platforms are covered in SECTION 02672, WATER-SUPPLY WELL CONSTRUCTION, Paragraph 3.04 D. See also SECTIONs 02224 and 02225 regarding materials of construction. The materials shall be standard materials of proven quality as manufactured by reputable concerns. Temporary roadways and drilling platforms shall be designed and constructed in accordance with the best practice of the industry and shall be installed and maintained for durability
- F. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS

- A. Definitions shall be as specified in PART I BIDDING PROCEDURES.



#### 1.04 SUBMITTALS

- A. The Contractor shall submit in the Well Installation Plan (see Specification SECTION 026729) a detailed layout of the Field Office including the proposed location for the office. Final proposed locations shall be subject to the Engineer's approval.
- B. For manufactured mobile trailers, prior to beginning of manufacture, the Contractor shall submit complete floor plans, assembly, flooring, and electrical drawings, together with detailed specifications and data covering materials used and all accessories and related equipment, in accordance with Section 01300.

#### 1.05 PRODUCT HANDLING

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage and shall be covered to prevent exposure to adverse conditions prior to installation.

#### 1.06 DESIGN CRITERIA

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with industry standards and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.

### PART 2 - PRODUCTS

#### 2.01 TEMPORARY FIELD OFFICE

- A. Furnish a temporary Field Office as required and obtain all necessary applicable permits and/or approvals required for their use. Such facilities shall be located as required and as to not interfere with the Work of the project and shall be completely removed at the completion of the Work.
- B. The Field Office, equipped as indicated herein, shall be provided and ready for use within 30 days after the NTP and shall be maintained in full operation until completion of the Work.
- C. Furnish the Field Office with heating, air conditioning, light, sanitary facilities, water for drinking, windows for natural lighting. The Field Office shall be well ventilated, and locks with keys turned over to Engineer.
- D. The Field Office shall be provided with parking spaces reserved exclusively for Engineer and Owner vehicles.
- E. Provide weather-surfaced road, at least 3 meters wide, to the Field Office.
- F. The Field Office

1. Provide a Field Office for the use of the Engineer. The office shall be of approximately 19 m<sup>2</sup> (200 ft<sup>2</sup>). Legally dispose of sanitary wastes. The office and rooms shall be constructed in a manner, and of materials, satisfactory to the Engineer. Office shall be weathertight with a minimum of six windows and two exterior doors. The office shall be adequately lighted for detailed working conditions, heated and air conditioned during the appropriate seasons. Thoroughly clean and mop the trailer on a weekly basis and restock all paper products such as but not limited to cups, towels, toilet paper, office copy paper, printer paper and plastic liners for waste baskets.
  - a. Furniture, furnishings and equipment subject to approval of the Engineer, shall be provided as follows:
    - 1 - Executive desk
    - 2 - Executive chairs
    - 1 - Bookcase 180 cm high x 92 cm wide (6' high x 3' wide)
    - 2 - 4 drawer steel files (locking, legal size)
    - 1 - Waste basket
    - 1 - Table 76cm x 180 cm (2'-6 x 6'-0)
    - 1 - Plan table 91 cm x 122cm (3'-0" x 4'-0")
    - 3 - Folding metal chairs
    - 1 - Water Cooler/Heater with 20L (5-gal) supply containers
    - 1 - 0.07 cubic meter (2.5 cubic foot) refrigerator
    - 1 - Small microwave oven
    - 1 - Black and White and Color copy machine, self-feeding, with 26cm x 28cm (8-1/2" x 11") and 28cm x 43 cm (11" x 17") printing capability, enlargement/reduction capability and scanning capability; provide cartridges, toner, paper, etc., for the project duration
    - 1 - Wi-Fi service
    - 1 - Push broom and dustpan
    - 1 - First aid kit
    - 1 - Fire extinguisher
2. Space shall be provided with crushed stone base for vehicles adjacent to the office for the exclusive use of the Engineer and visitors. Remove snow, mud, and control dust in the parking area adjacent to the office.

- G. Provide labor and material to locate and level the Field Office with access stairs, ramps and platforms as necessary to facilitate access.
- H. Operate and maintain facilities and associated equipment at own expense.
- I. Furnish janitorial services for the field office at least once a week. Service to include replenishing paper cups, paper towels, liquid soap, and toilet paper.
- J. Provide required utilities to facilities.
  - 1. Metered electric service.
  - 2. Thermostatically controlled heating unit or system of adequate capacity to maintain a minimum temperature of not less than 20 degrees C under all cold weather conditions. The Contractor shall provide all fuel used and service necessary.
  - 3. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 4. Thermostatically controlled, refrigerant type, air conditioner of adequate capacity to maintain a maximum temperature of not more than 22 degrees C. under all hot weather conditions. Contractor shall provide all service necessary and provide all power used.
  - 5. Adequate lighting and at least ten (10) duplex electrical receptacles.
  - 6. High speed internet service with wireless access. The Contractor shall be responsible for connection and paying all fees associated with providing this service for the duration of the Contract.
- K. Upon completion of the Work and written approval of Engineer, disconnect utilities from facilities, remove off-site, and restore area.
- L. Carry insurance coverage to protect losses of Contractor, Engineer's and the Owner's property on and in the trailers.

## 2.02 INTERNET SERVICE

- A. The Contractor shall provide separate internet lines for access from the Engineer's Field Office, based on the following:
  - 1. A connection of 8Mbps,
  - 2. A dedicated Microwave internet connection equivalent to a fiber connection of 8 Mbps.
  - 3. A 30 Mbps ADSL connection or a 16 Mbps dedicated corporate.

The Internet Service Provider (ISP) service shall be for the exclusive use of the Engineer and Owner's personnel and shall be separate and in addition to internet service used by the Contractor. In such cases where there is no required cable internet service available, the Contractor shall provide an equivalent. Contractor will be responsible for renewal costs and all associated fees until the Engineer deems the Work complete. Contractor shall obtain and

pay for a service and repair contract with a local representative of the internet services dealer or manufacturer for weekly on-site visit.

## 2.03 TEMPORARY FENCE

### A. Temporary Perimeter Fencing

1. Temporary perimeter fencing is to be supplied and installed by the General Contractor, to enclose and secure the Field Office, while providing screening of construction activities.
2. Temporary fence shall be 2.4 meters (8 feet) above grade. All fence panels shall align with adjacent panels along top.
3. Fencing metals to be low sheen black finish, 60 mm (2 3/8") galvanized posts with 11 gauge chain link fencing, 41 mm (1 5/8") top and bottom rail. All fencing is to have screening fabric, attached with galvanized metal heavy gauge wire clips, black color.
4. Screening fabric shall be knitted polyethylene cloth, with reinforced band and grommets along top and sides for secure anchoring to chain link panels.
5. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.

## PART 3 - EXECUTION

### 3.01 POTABLE WATER

- A. A new freestanding self-contained bottled water cooler shall be provided in the Field Office. The unit shall accept a 20 liter or equivalent "bottled water" bottle or equivalent to be furnished and serviced by the Contractor.
- B. Two additional 20-liter bottles of water shall be stockpiled on site, and additional bottles of water shall be provided so that the supply is uninterrupted throughout the Work.

### 3.02 ELECTRICITY

- A. Arrange for, furnish and maintain all expenses for all electricity required for proper lighting, heating, cooling and powering of the Field Office to the time of final acceptance of the Work. Contractor shall be responsible for payment of electric power utility use charges over the period between startup of utility service and final acceptance of the Work.
- B. Power shall be obtained directly from power company lines.
- C. Temporary connections for electricity shall be subject to approval of the power company representative and shall be removed in like manner at the Contractor's expense prior to final acceptance of the Work.

- D. Wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. Electrical facilities shall conform to the requirements of local electric utility providers.

### 3.03 SANITARY CONVENIENCES

- A. Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors.
- B. Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.

### 3.04 PROJECT SIGNS

- A. Contractor shall provide Project Sign(s) in accordance with MCA Requirements.

### 3.05 BARRICADES AND GUARD LIGHTS

- A. Barricades, signs, fences and similar safety and warning devices shall be provided as required, in order to ensure the protection of employees and others concerned with their duties and presence on the premises at the project site.
- B. Provide and maintain guard lights at all barricades, obstructions in plant ways, and at all trenches and pits adjacent to traveled ways.

### 3.06 TEMPORARY HEAT

- A. During the months of October through April, provide heat, fuel and services necessary to protect the Field Office against injury from dampness and cold and to maintain temperature above 13 °C (55 °F).

### 3.07 SHELTER AND PROTECTION OF MATERIALS

- A. Provide adequate storage facilities for all materials required for the Work. The facilities shall be enclosed, heated and provided with moisture control, as required to provide adequate protection and shall be satisfactory to the Engineer.

### 3.08 SECURITY

- A. Contractor shall be responsible for protection of the Site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons.
- B. No Claim shall be made against Owner by reason of any act of an employee or trespasser, and Contractor shall make good all damage to Owner's property resulting from Contractor's failure to provide security measures as specified.
- C. Security measures shall include security fencing, barricades, lighting, and other measures as required to protect the Site. Additionally, the Contractor shall engage a guard service to furnish uniformed watchmen at the Site during all non-working hours twenty-four hours a day, seven days a week.

- D. The Contractor shall do the following for Site entry control: restrict entry of unauthorized persons and vehicles into Site and existing facilities; allow entry only to authorized persons with proper identification; maintain log of workmen and visitors and make log available to Owner on request; coordinate access of Owner's personnel to Site.

END OF SECTION



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## SECTION 01500 (CP-2)

## TEMPORARY FACILITIES

## PART 1 - GENERAL

## 1.01 SCOPE

- A. The work of this section includes the furnishing of all labor, tools, equipment and materials, performing all operations necessary to provide temporary facilities as specified herein and as directed by the Engineer.
- B. This Section covers the Field Offices, Construction Visitor Center, equipment, and services provided by the Contractor for Engineer and Owner's use during the implementation of Work. Engineer and Owner shall return Field Offices, Construction Visitor Center, equipment, and supplies to Contractor at the completion of Contract, in used condition, wear and tear included.
- C. The Contractor shall pay for all costs of offices, visitor center, equipment, and services supplied under this Section.
- D. The Contractor shall pay for all operation and maintenance costs, to include materials, wages, utility fees and all other costs needed for the full operation of all temporary facilities specified under this section during the whole contract period and as directed by the Engineer.
- E. Contractor shall take full possession and control of the facilities, equipment, and supplies after completion of this Contract.
- F. The materials covered by this specification are intended to be standard materials of proven ability as manufactured by reputable concerns. Materials shall be designed and constructed in accordance with the best practice of the industry and shall be installed in accordance with the manufacturer's recommendations. The specifications call attention to certain features but do not purport to cover all details entering into the construction.
- G. Attention is directed to SECTION VII GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS

- A. Definitions shall be as specified in PART I BIDDING PROCEDURES.

## 1.04 SUBMITTALS

- A. Within 14 days after the Commencement of the Works, the Contractor shall submit a detailed layout of the field offices and construction visitor center including proposed locations for the

offices.

- B. For manufactured mobile trailers, prior to beginning of manufacture, the Contractor shall submit complete floor plans, assembly, flooring, and electrical drawings, together with detailed specifications and data covering materials used and all accessories and related equipment, in accordance with Section 01300.

#### 1.05 PRODUCT HANDLING

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage and shall be covered to prevent exposure to adverse conditions prior to installation.

#### 1.06 DESIGN CRITERIA

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with industry standards and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

### PART 2 - PRODUCTS

#### 2.01 TEMPORARY FIELD OFFICES

- A. Furnish temporary offices, storage and fabrication facilities as required and obtain all necessary applicable permits and/or approvals required for their use. Such facilities shall be located as required and as to not interfere with the work of the project and shall be completely removed at the completion of the work.
- B. Field Offices and Construction Visitor Center, equipped as indicated herein, shall be provided and ready for use within 30 days after the Commencement of the Works and shall be maintained in full operation for a period of 14 days after the Defect Notification Period commences in a reduced number of facilities agreed by the Engineer.
- C. Field offices and visitor center shall be located at the construction site as noted on the Construction Drawings. Final proposed locations shall be submitted to the Engineer for approval.
- D. Furnish field offices and construction visitor center with heating, air conditioning, light, toilet facilities including lavatory, water for drinking, windows for natural lighting, be well ventilated, and locks with keys turned over to Engineer.
- E. Field offices and visitor center shall be provided with a minimum of 20 parking spaces reserved exclusively for Engineer, Owner and Visitor vehicles.

F. Provide weather-surfaced road, at least 3 meters wide, to the Field Office and Visitor Center.

G. FIELD OFFICE

1. Provide at the start of the work and for the duration of the project, unless otherwise directed, a field office for the use of the Engineer. The office and rooms shall be constructed in a manner, and of materials, satisfactory to the Engineer, and shall include unencumbered emergency egress. Office shall be weathertight with sufficient windows and exterior doors. The office shall be adequately lighted for detailed working conditions, heated and air conditioned during the appropriate seasons (each room to be individually controlled).
2. Thoroughly clean and mop the trailer on a daily basis and restock all paper products such as but not limited to cups, towels, toilet paper, office copy paper, printer paper and plastic liners for waste baskets.
3. The following table provides an overview of the office, including size and equipment. The Contractor shall submit to the Engineer for approval, no later than 14 days after commencement date, layout drawings with the corresponding entries and designations.

Room	Size	Furniture
Meeting Room 1 No	$\geq 30 \text{ m}^2$	10 conference tables each 1,20 m x 0,80m 20 armchairs 10 chairs 1 white board, 1,50 m x 1,00 m 4 bookshelves, 1 m x 2 m, 30 cm deep 2 coat racks 2 waste baskets
Office 1 3 No	$\geq 12 \text{ m}^2$	Each: 1 desk $\geq 4 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 1 chair with rolling casters 2 swivel chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 1 waste basket
Office 2 4 No	$\geq 16 \text{ m}^2$	Each: 2 desks $\geq 3 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 2 desk chairs 2 office chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 2 waste baskets
Office 3 AutoCAD and Video Control 1 No 1	$\geq 12 \text{ m}^2$	2 Desk $\geq 3 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 2 desk chairs 2 office chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 2 waste baskets
Kitchen	$\geq 6 \text{ m}^2$	1 sideboard

Room	Size	Furniture
1 No		2 cupboards 0.8x0.6x0.3 m 2 boilerplates 1 electrical water boiler 1 refrigerator/freezer combination volume min. 270 l. 1 waste bucket 1 coffee machine, Espresso 2 Hot/cold water dispenser cups, saucers, plates, knives, forks and spoons, teapot all to serve 12 persons
Toilet 2 No	3 m <sup>2</sup>	Each: western W.C suite toilet roll holder wash hand basin mirror towel rail soap dispenser
Shower room 1No	3m <sup>2</sup>	standard shower towel rail soap dispenser mirror
Hall 1 No		2 fire extinguishers, wall mounted 4 first aid kits

#### 4. Office Equipment Specification

Desk	Desk board 25 mm thick covered with MDF Table depth: throughout 1000 mm Work height: 750 mm Units locked shelf covered by natural MDF with 2 drawers could be placed under the table The feet shall be chromium coating
Desk Chair	Min 6 pieces swivel chairs Pneumatic Seat Height Adjustment 360° Swivel Tilt Tension Adjustment Tilt Lock Mechanism Seat board shall have minimum 10 cm thickness Backboard shall be concave polypropylene to meet body ergonomic
Office Chair	Min. 4 pieces swivel chairs Pneumatic Seat Height Adjustment 360° Swivel Tilt Tension Adjustment Backboard shall be meet body ergonomic
Bookshelf	Bookshelf min. 25 mm thick covered with MDF Dimensions 1 m x 2 m, 30 cm deep Min 3 open and 3 lockable shelves
Sideboard	Min. 25 mm thick covered with MDF Dimensions 2.0x0.8x0.6 m with tap + sink upper side of kitchen working

## 5. Fire Extinguisher

- i. Wall mounted hand operated fire extinguishers shall be of the all-purpose, nitrogen pressured, dry chemical type. Fire extinguishers shall be provided at each site during construction. The fire extinguishers shall meet international industrial standards and shall be 10 kg and the color of the shell shall be red. Wall mounting brackets shall be furnished. Two fire extinguishers shall be installed in the Engineer's field offices to be used for this Contract.

## 6. First Aid

- a. The Contractor shall provide and maintain at own expense on the Site, adequate and easily accessible first-aid kits and facilities for treatment of accidents during the execution of the Works under the Contract and such outfits as may be required under any relevant laws, bylaws, ordinances and regulations in force. The places where these items are kept shall be prominently marked.
- b. Contractor staff shall include employees trained and fully qualified in the use of first aid, duly identified and designated and made known to all employees by posting their names and first aid qualifications in a prominent location at the Site. The Contractor shall ensure that a person trained in first aid is available at the Works sites, at Temporary Facilities, and at the Engineer's office.
- c. Any order from the Engineer to renew first aid materials, extend the supply of first aid materials and kits, or increase the number of first aid trained staff, shall be promptly carried out.
- d. First aid kits shall be required at Temporary Facilities, Field offices and in each vehicle.

## 7. Heating and Cooling

- a. The Contractor shall provide electrical heating and cooling system for all rooms and halls. The system must be capable of maintaining reasonable office temperature during the coldest winter months.

## 8. Office and Field Equipment

- a. The Contractor shall provide, equip, and maintain on site the following for the sole use of the Engineer and the Employer until the end of the contract:



Notebook, 15,6" FHD IPS, Intel i7-8565U latest generation, 32GB RAM, 1000 GB SSD + 1TB HDD, MX250, Win10 latest version, MS 365	6 No
External Solid-State Drive, 1 TB, USB 3.1	4 No
Multifunction Color Laser Printers (Printer, Fax, Photocopy, Scanner)	2 No
Projector - Full HD, 4000 ANSI Lumen, 10.000:1 Contrast, WLAN, HDMI	1 No
Digital Camera, not less than 20 MP	2 No
Tablet, Weatherproof, anti-shock, 10-inch, 64 GB, Cellular + WIFI	6 No
Video Camera for surveillance, higher than 4MP, night vision, weatherproof, movable, zooming function, to be installed in the locations approved by the Engineer to provide an overview of the complete construction site and temporary facilities with internet connection, fully controlled remotely by the Engineer, local storage capacity for recording of all cameras for 24hours/day for at least 30 days. Emergency power supply (UPS) suitable for supplying the surveillance system for at least 12 hours in case of power loss.	10 No

- b. Latest versions of MS Office, Anti-Virus Software with automatic update subscription software package will be provided for each computer.
- c. All above equipment shall be provided in the still sealed manufacturer's packaging and the Engineer shall retain exclusive admin rights for the duration of the project.
- d. The Contractor shall provide and maintain the following for the exclusive use of the Employer and Engineer's Representative and his staff for checking the setting-out and levels of the work:

Survey Instrument set (Electronic distance meter) and accessories	1 No
Theodolite	1 No
Total Station	1 No
30 m steel measuring tapes graduated in millimeters and centimeters	3 No
5 m steel measuring tapes	3 No
Surveying supplies as needed including pegs, steel rods and angles, ranging rods, concrete, paint etc.	As needed

## 9. Personal Protection Equipment

- a. The Contractor shall provide the following clothing for the exclusive use of the Employer and Engineer and his staff:

Safety helmets	15 No
High Visibility Vests	15 No
Waterproof coats color yellow in assorted sizes (to be specified) complete with belt, over trousers and hat, separate winter warm liners,	15 No

obtained from an approved supplier.	
Pairs of rubber safety wellingtons in assorted sizes (to be specified)	15 No
Pairs of safety boots in assorted sizes (to be specified)	15 No

## 10. Miscellaneous Requirements

### a. Consumables

The Contractor shall supply fax/photocopy paper (A4 and A3 sizes), ink and toner replacements, DVD's and CD's, towels, soap, toilet paper, disinfectant, cleaning materials and required maintenance consumables.

### b. Ownership

The Employer and Engineer's field office shall be new and shall remain the permanent property of the Contractor. The contents of the Field Office including all specified furniture, service fittings and equipment shall be new and shall be returned to the Contractor on termination or completion of the Contract.

### c. Governing Standards

The field office shall be designed, built, and installed in compliance with all applicable plumbing, electrical, structural, etc., codes in effect for Mongolia.

### d. Handling

All electronic equipment and office furnishings shall be handled in a manner that will prevent damage. Any damaged item found after receipt and prior to the Employer and Engineer's acceptance of the item will be replaced or repaired by the Contractor as recommended by the Engineer.

### e. Equipment Warranty

All equipment shall be provided with the manufacturer's standard warranty.

### f. Maintenance

The Contractor shall make any required and scheduled (as recommended by the manufacturer) maintenance and repairs to the field office and its contents during the period of this Contract.

The Contractor shall clean the field office at least daily, unless directed by the Engineer that cleaning is required more frequently, and all trash shall be collected and removed daily to a proper disposal point.

### g. Acceptable Manufacture

The Contractor shall provide a detailed layout of the field office to be approved by the Engineer prior to fabrication.

#### h. Installation

The field office and all equipment shall be set up at a location indicated by the Employer and the Engineer and in accordance with the manufacturers' recommendations and local codes. The Employer and Engineer's field office shall be at a location adjacent to the site of the Contractor's office, nominated by the Contractor and approved by the Employer and Engineer. If not already existing, all-weather roads to the field office shall be provided by the Contractor. Adjacent to the field office, a graveled parking area with car parking suitable for at least 20 vehicles in all-weather shall be provided and maintained by the Contractor

#### i. Communications Systems

The Contractor shall make all necessary arrangements and pay all installation charges for telephone lines in offices at the Site and 2 separate telephone lines in the office of the Employer and Engineer and shall provide a self-answering fax and a switchboard suitable for 5 separate extensions together with an extension and telephone instrument for each room as registered consumer. The telephone service and instruments in the Employer and Engineer's office shall be a touch tone system if locally available. In addition to the office telephone system the Contractor shall provide 5 no. mobile telephones for the Employer and Engineer including line and machine. The telephone and fax services shall be in the name of Contractor, and all charges, including calls and maintenance after installation shall be billed to and paid by the Contractor. Also, wireless connection will be available for Employer, Engineer, and other personnel in temporary facilities

#### j. Temporary Sanitary Facilities

The Contractor shall provide, furnish, and maintain temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work on site.

### H. CONSTRUCTION VISITOR CENTER

1. Furnish field office facilities for use as a visitor's center during the construction period within 30 days after having cleared the selected trailer site, and a maximum 60 days after Notice to Proceed. The location of the visitor center shall be adjacent to the Engineer's site offices and shall be approved by Engineer.
2. Construction visitor center: New or like new trailer containing not less than 55 m<sup>2</sup>.
3. Office layout: Approved by Engineer and the facility shall be partitioned so as to provide a reception/administration area, audio visual storage closet, Personal Protective Equipment (PPE) storage closet, large conference room/briefing room, and bathroom facilities.
4. Lease, with maintenance agreement for the term of construction contract and install new furniture and equipment for the exclusive use of the Visitors Center.

1 - Folding Conference Table, 3.65 m by 1.2 m (12 feet by 4 feet) with 24 padded folding chairs.

- 1 - Desk, 1524 mm by 762 mm (60 inches by 30 inches) with lock.
- 1 - Chair, Rotary with arms, upholstered.
- 1 - Bookcase, 2133 mm by 762 mm wide (84 inches high by 30 inches).
- 1 - Four-drawer Filing Cabinet, fireproof, legal size locks.
- 1 - Storage Cabinet with lock.
- 1 - Fluorescent Lamps, Desk.
- 1 - Water Cooler, Electric – refrigerated.
- 1 - Fire Extinguisher.
- Portable or pull-down projection screen.
- LCD Projector.
- 1 - Coat Rack or closet.
- 2 - Tack boards, 610 mm by 965 mm (24 inches by 38 inches).
- 3 - Wastebaskets.
- 1 - Venetian Blind at each window.
- 1 - Electric coffee maker.
- 1 – 0.03 cubic meter (1CF) Microwave Oven.
- 1 – 0.17 cubic meter (6CF) Refrigerator.
- 1 - Fax machine.
- Telephones for each desk, with speaker option.
- Telephone answering machine or private voicemail service.
- Broom and dustpan.
- 40 hard hats and 40 pair of safety glasses.

5. Provide one copying machine with supplies and service. Machine shall be capable of copying A3 and A4 paper sizes. Copy rate shall be at least 20 copies per minute for A4 paper size.
6. Provide two laptop computers with the following specification: Notebook, 15.6” FJD IPS, Intel i7-856U latest generation, 32GB RAM, 1000GB SSD + 1TB HDD, MX250, Win10 latest version, MS 365.

7. Printer, HP Laser Jet series 3600N or equal; and peripherals necessary to make a complete and operable system. Provide an uninterruptible power supply system consisting of APC model 200 or equal.
- I. Provide labor and material to locate and level Field Office and Visitors Center with access stairs, ramps and platforms as necessary to facilitate access.
- J. Operate and maintain facilities and associated equipment at own expense.
- K. Furnish janitorial services at least once a week. Service to include replenishing paper cups, paper towels, liquid soap, and toilet paper.
- L. Provide required utilities to facilities.
  1. Metered electric service.
  2. Thermostatically controlled heating unit or system of adequate capacity to maintain a minimum temperature of not less than 20 degrees C under all cold weather conditions. The Contractor shall provide all fuel used and service necessary.
  3. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  4. Thermostatically controlled, refrigerant type, air conditioner of adequate capacity to maintain a maximum temperature of not more than 22 degrees C. under all hot weather conditions. Contractor shall provide all service necessary and provide all power used.
  5. Adequate lighting and duplex receptacles.
  6. Telephone service of 8 twisted pair cable to the office.
  7. High speed internet service with wireless access. The Contractor shall be responsible for connection and paying all fees associated with providing this service for the duration of the Contract.
- M. Upon completion of the Work and written approval of Engineer, disconnect utilities from facilities, remove off-site, and restore area.
- N. Carry insurance coverage to protect losses of Contractor, Engineer's and the Owner's property on and in the trailers.

## 2.02. VEHICLES FOR EMPLOYER AND ENGINEER

### A. General

1. Within 30 days after Effective Date, the Contractor shall provide two vehicles and the Employer will allocate them for the exclusive use of this work for the duration of the Contract. All costs incurred for supply and maintenance of these vehicles will be reimbursed under the Contract.

2. In the event of failure to supply vehicles within the time specified, the Employer reserves the right to provide such vehicles as are necessary until such time as the specified vehicles are made available. Cost incurred for provision and maintenance of these vehicles will be deducted from monies due or to become due to the Contractor.
3. The vehicles will be subjected to severe operating conditions in climate ranging from hot to extreme cold environment.
4. The Contractor shall submit for review, technical literature, and specifications in sufficient detail to identify and describe the vehicles and all options proposed.
5. The vehicles shall be new and shall be either leased or purchased. Upon completion or termination of the Contract, the vehicles shall be returned to the Contractor. The vehicles shall be suitable for the Mongolian climate and use locally available fuel.
6. The Contractor shall provide for all operating and maintenance costs required to ensure that all vehicles are in good, safe and legal operating condition including taxes, comprehensive insurances to cover use at all times, and driving by drivers provided by the Contractor, and the Employer, the Engineer, other Employer's Representatives and staff and any other drivers designated, licenses, fuel, spare parts, lubricants, preventative maintenance, and repairs. In the event of a breakdown or accident, the Contractor shall furnish a replacement vehicle within 24 hours.
7. The Contractor shall provide approved competent, licensed drivers for those vehicles designated by the Employer for his use during working hours, for any duration, and including any overtime or weekend work when required by the Employer, to all places related to the Work as directed by the Employer. The drivers will generally be required to work site hours, or other times when work is being carried out on site.

#### B. Vehicle Types

- 1 The vehicles to be provided for the Engineer shall be: 2 No, 4WD vehicles.

#### C. Vehicles General Description

- 1 The vehicles (SUV type) and accessory equipment installed or furnished shall be the latest locally available improved models in current production at time of delivery. They shall be the standard production models offered to commercial firms and shall be of new manufacture, including all parts, components, and accessory items.
2. Parts and components not specifically mentioned in this specification, but which are required to provide a complete vehicle or to comply with any Mongolian Law, shall be included as a part of the equipment to be furnished.
3. Vehicles shall include project-specific signage as well as safety flags, to readily identify these as vehicles authorized on the site of Works, and for operators of heavy equipment to readily identify the presence of a passenger vehicle.
4. Vehicles Additional Requirements
  - a. The vehicles shall have differential, brakes, suspension, wheels, tires, and other component parts necessary to give maximum performance, service, life, and



safety, and not merely meet minimum requirements of the Specification. The engine capacity shall be minimum 2500 cc.

- b. The vehicles shall have ABS Brakes Air Conditioning, Central Locking, Electric Windows, Inertia reel seatbelts, airbags.
- c. Vehicles shall be equipped with spare tire with wheel, snow chains, jack, jack handle, lug wrench and other tools required for emergency maintenance, and operations manual.

## 2.03 INTERNET SERVICE

- A. The Contractor shall provide separate internet lines for access from the Engineer's Field Office and Construction Visitor Center, based on the following:

- 1. A fiber connection of 8Mbps,
- 2. A dedicated Microwave internet connection equivalent to a fiber connection of 8 Mbps.
- 3. A 30 Mbps ADSL connection or a 16 Mbps dedicated corporate.

The Internet Service Provider (ISP) service shall be for the exclusive use of the Engineer and Owner's personnel and shall be separate and in addition to internet service used by the Contractor. The line shall also be separate and in addition to the telephone service line specified herein. In such cases where there is no required cable internet service available, the Contractor shall provide an equivalent. Contractor will be responsible for renewal costs and all associated fees until issuance of Taking-Over Certificate Final Acceptance Certificate. Contractor shall obtain and pay for a service and repair contract with a local representative of the internet services dealer or manufacturer for weekly on-site visit.

## 2.04 TELEPHONE SERVICE

- A. Within 30 days after the date of the Notice to Proceed, the Contractor shall provide in the Field Offices and Construction Visitor Center a telephone system, in good working order, at the conference desk for the use of the Engineer's and Owner's employees in connection with the Works. The telephone system shall have wide band HD voice quality speaker sound output, and one wireless handset shall be kept at the Construction Visitor Center for business communication. The line shall be separate and in addition to the telephone service used by the Contractor. Contractor will be responsible for renewal.
- B. All telephone service charges shall be paid by the Contractor for the duration of the Contract.
- C. Service Contract: The Contractor shall obtain and pay for a service and repair contract with a local representative of the telephone services dealer or manufacturer for weekly on-site visit.

## 2.05 OTHER

- A. Attendance Upon the Employer and Engineer

1. The Contractor shall provide qualified personnel to assist the Employer and Engineer in conducting all field tests. The Contractor shall provide for such labor as is reasonably necessary to attend to the office requirements, clean the instruments and assist the Employer and Engineer in measuring, supervising, checking, testing, examining or setting out the Contractor's Work in any way whatsoever at any time of day and night. All assistance shall be provided under the direct supervision of the Engineer.

#### B. Nameboards

1. The Contractor shall provide, erect and maintain until completion of the Contract nameboards at the entrance to each Site bearing the Employer's and Engineer's names, the name of the project, the Contractor's name and such other names and information as the Employer and the Engineer may direct. The Contractor shall submit the design of the nameboards for the Employer and Engineer's approval prior to fabrication and erection. The nameboards are to be not less than 3m x 2m and written in the English and Mongolian languages.

#### C. Bilingual Secretary and Supporting Staff

1. The Contractor shall employ for the exclusive use of the Employer and Engineer an approved bilingual (English-Mongolian) typist/secretary to work in the Engineer's field office on a full-time basis. The primary role of the secretary will be to coordinate and facilitate the work between Employer/Engineer and the Contractor, including organizing inspection dates for the Contractor and coordinate with Contractor during inspections by the Engineer.
2. The Contractor shall provide qualified personnel to assist the Employer and the Engineer in conducting all field tests. The Contractor shall provide for such labor as is reasonably necessary to attend to the office requirements, clean the instruments and assist the Employer and Engineer in measuring, supervising, checking, testing, examining or setting out the Contractor's Work in any way whatsoever at any time of day and night. All assistance shall be provided under the direct supervision of the Engineer.

#### 2.06 TEMPORARY FENCE

- A. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.

### PART 3 - EXECUTION

#### 3.01 TELEPHONE SERVICES

- A. Not applicable

#### 3.02 WATER

- A. All water required for and in connection with the Work to be performed and for any specified

tests of piping, equipment or tanks, thru the milestone date for CP-3 shall be provided by and at the expense of Contractor. No separate payment for water used or required will be made and all costs in connection therewith shall be included in the Bid. The Contractor shall provide facilities necessary to convey water from the source to the points of use in accordance with the requirements of the Contract Documents.

Water service to the Engineer's Field Office and Construction Visitor Center shall be supplied by the Contractor. The Contractor shall provide sufficient potable drinking water from an acceptable source to all of the Contractor's employees and Engineer's staff.

- B. Water used for domestic purposes shall be free of contamination and shall conform to the requirements of the local authorities for potable water. The Contractor shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water there from.
- C. Contractor shall provide adequately against waste and needless use of water.
- D. A new freestanding self-contained bottled water cooler shall be provided in the field offices and construction visitor center. The unit shall accept a 20 liter or equivalent "bottled water" bottle or equivalent to be furnished and serviced by the Contractor.
- E. The Contractor shall not make connection to or draw water from any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the said authority, of a size and type acceptable to said authority and agency. The Contractor shall pay permit and water charges.

### 3.03 ELECTRICITY

- A. Arrange for, furnish and maintain all expenses for all electricity required for proper lighting, the use of power tools, for temporary heat for construction operations and for the field offices and construction visitor center up to the time of final acceptance of the project. Contractor shall be responsible for payment of electric power utility use charges over the period between startup of utility service and final acceptance of the project.
- B. Furnish all wiring, fixtures, lamps and other accessories required for his or his subcontractors' work, and for proper lighting, the use of power tools and for temporary heat for construction operations up to the time of final acceptance. Power shall be obtained directly from power company lines or from portable, gasoline or diesel driven generator sets.
- C. Temporary connections for electricity shall be subject to approval of the power company representative and shall be removed in like manner at the Contractor's expense prior to final acceptance of the Work.
- D. Wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. Electrical facilities shall conform to the requirements of local electric utility providers

### 3.04 SANITARY CONVENIENCES

- A. Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors. Separate facilities shall be provided for male and female employees.
- B. Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.

### 3.05 PROJECT SIGNS

- A. Contractor shall provide Project Sign(s) in accordance with MCA Requirements.

### 3.06 BARRICADES AND GUARD LIGHTS

- A. Barricades, signs, fences and similar safety and warning devices shall be provided as required, in order to ensure the protection of employees and others concerned with their duties and presence on the premises at the project site.
- B. Provide and maintain guard lights at all barricades, obstructions in plant ways, and at all trenches and pits adjacent to traveled ways.

### 3.07 TEMPORARY HEAT

- A. During the months of October through April, provide heat, fuel and services necessary to protect all of the work and materials against injury from dampness and cold and to maintain temperature above 13 °C (55 °F) in all enclosed portions of the project. Provide temporary heating devices, electrical power, adequate and proper fuel, fire enclosures, and the like, as required for the work of all trades, and shall have watchmen constantly in attendance when fires are burning. Only approved equipment specifically designed for the purpose shall be used. Open salamanders will not be allowed.
- B. The permanent heating system may be used for temporary heat prior to the occupancy of the buildings by the Owner, or as otherwise approved by the Engineer, however, the use of permanent equipment for temporary heat purposes shall not affect the guarantee period stated elsewhere in these specifications. Operate and maintain the temporary heating system (including fuel) and the equipment used for temporary heat until final completion of the project, and repair and replace all items damaged during temporary use. Clean all of the permanent heating equipment if it is used for temporary heat before turning the system over to the Owner. Contractor shall be responsible for payment of the district hot water utility use charges over the period between startup of utility service and final acceptance of the project.

### 3.08 TEMPORARY CLOSURES

- A. Temporary doors and closures for all openings shall be furnished and installed to keep out inclement weather and intruders until the permanent units are installed. Any loss or damage caused by failure to comply with the above provisions shall be replaced and/or repaired at no additional cost to the Owner.

### 3.09 SCAFFOLDING

- A. Furnish, erect, maintain in a safe condition and remove all scaffolding required for the execution of the work not specified as being furnished under other sections herein.
- B. Neither the Engineer nor the Owner will act as an arbitrator on questions of whether the Contractor or any of his subcontractors shall furnish or remove scaffolding required for any portion of the work.

### 3.10 SHELTER AND PROTECTION OF MATERIALS

- A. Provide adequate storage facilities for all materials required for the work. The facilities shall be enclosed, heated and provided with moisture control, as required to provide adequate protection and shall be satisfactory to the Engineer.

### 3.11 BRACING, SHORING AND SHEETING

- A. Provide all bracing, shoring and sheeting as required for safety and for the proper execution of work. Unless otherwise ordered by the Engineer, all bracing, shoring, and sheeting shall be removed when work is completed.

### 3.12 SECURITY

- A. Contractor shall be responsible for protection of the Site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons. Contractor's effort shall include provision of staff and dedicated temporary facilities (office, guardhouse, bathroom/lavatory facilities etc.) The Contractor shall initiate program in coordination with Owner's existing security system at mobilization and maintain program throughout construction period until Owner's occupancy.
- B. No Claim shall be made against Owner by reason of any act of an employee or trespasser, and Contractor shall make good all damage to Owner's property resulting from Contractor's failure to provide security measures as specified.
- C. Security measures shall include security fencing, barricades, lighting, and other measures as required to protect the Site. Additionally, the Contractor shall engage a guard service to furnish uniformed watchmen at each Site during all non-working hours twenty-four hours a day, seven days a week until Owner's guard is permanently assigned to the site.
- D. The Contractor shall do the following for Site entry control: restrict entry of unauthorized persons and vehicles into Site and existing facilities; allow entry only to authorized persons with proper identification; maintain log of workmen and visitors and make log available to Owner on request; coordinate access of Owner's personnel to Site.

### 3.13 CLEANING AND JANITORIAL SERVICES

- A. Provide janitorial services to include thorough cleaning of all interior floors and furniture, including kitchen, bathrooms, and entrance areas, through the regular working hours.

- B. Empty and clean all trash and garbage containers, dispose of all waste at a designated and approved disposal site.
- C. Maintain all equipment and systems as required.

END OF SECTION



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## SECTION 01500 (CP-3) – Working Draft

## TEMPORARY FACILITIES

## PART 1 - GENERAL

## 1.01 SCOPE

- A. The Work of this section includes the furnishing of all labor, tools, equipment and materials, performing all operations necessary to provide temporary facilities as specified herein and as directed by the Engineer.
- B. This Section covers the Field Offices, equipment, structures, facilities, and services provided by the Contractor for Engineer and Owner's use during the implementation of Work. Engineer and Owner shall return Field Offices, equipment, and supplies to Contractor at the completion of Contract, in used condition, wear and tear included. Field Offices shall be designed and constructed in accordance with the best practice of the industry and shall be installed in accordance with the manufacturer's recommendations.
- C. The Contractor shall pay for all costs of Field Offices, equipment, and services supplied under this Section.
- D. The Contractor shall pay for all operation and maintenance costs, to include materials, wages, utility fees and all other costs needed for the full operation of all temporary facilities specified under this Section during the whole contract period and as directed by the Engineer.
- E. Contractor shall take full possession and control of the Field Offices, equipment, and supplies after completion of this Contract.
- E. The materials covered by this specification shall be standard materials of proven quality as furnished by reputable companies. Materials and facilities shall be designed and constructed in accordance with the best practice of the industry and shall be installed and maintained for durability. Temporary roadways are covered in SECTIONs 02224 and 02225 regarding materials of construction. The specifications call attention to certain features but do not purport to cover all details entering into the construction.
- F. Attention is directed to SECTION VII GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS

- A. Definitions shall be as specified in PART I BIDDING PROCEDURES.

#### 1.04 SUBMITTALS

- A. Within 14 days after the Commencement of the Works, the Contractor shall submit a detailed layout of the field offices including proposed locations for the offices. One field office shall be located at the Shuvuun Well Field, a separate office located at the Biokombinat Well Field, and a third office at a central location along the Finished Water Transmission Pipeline. Final proposed locations shall be subject to the Engineer's approval.
- B. For manufactured mobile trailers, prior to beginning of manufacture, the Contractor shall submit complete floor plans, assembly, insulation, wall and roof sections, flooring, and electrical drawings, together with detailed specifications and data covering materials used and all accessories and related equipment, in accordance with Section 01300.

#### 1.05 PRODUCT HANDLING

- A. All materials and equipment shall be shipped, stored, handled and installed according to the manufacturer's written recommendations.
- B. The materials and equipment shall be stored on a flat, clean, dry surface to prevent damage and shall be covered to prevent exposure to adverse conditions prior to installation.

#### 1.06 DESIGN CRITERIA

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with industry standards and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

### PART 2 - PRODUCTS

#### 2.01 TEMPORARY FIELD OFFICES

- A. Furnish temporary offices, storage and fabrication facilities as required and obtain all necessary applicable permits and/or approvals required for their use. Such facilities shall be located as required and as to not interfere with the Work of the project and shall be completely removed at the completion of the Work.
- B. Field Offices, equipped as indicated herein, shall be provided and ready for use within 30 days after the Commencement of Works and shall be maintained in full operation for a period of 30 days after commissioning, startup and acceptance of the CP-3 Conveyance facilities in a reduced number of facilities agreed by the Engineer.
- C. Furnish field offices with heating, air conditioning, lighting, sanitary facilities, water for drinking, windows for natural lighting. Offices shall be well ventilated, and locks with keys turned over to Engineer.

- D. Field offices shall be provided with parking spaces reserved exclusively for Engineer and Owner vehicles.
- E. Provide weather-surfaced road, at least 3 meters wide, to each Field Office.
- F. Field Offices
1. Provide three Field Offices for the use of the Engineer. Legally dispose of sanitary wastes. The office and rooms shall be constructed in a manner, and of materials, satisfactory to the Engineer and shall include unencumbered emergency egress. Office shall be weathertight with sufficient windows and exterior doors. The office shall be adequately lighted for detailed working conditions, heated and air conditioned during the appropriate seasons.
  2. Thoroughly clean and mop the trailer on a daily basis and restock all paper products such as but not limited to cups, towels, toilet paper, office copy paper, printer paper and plastic liners for waste baskets.
  3. The following table provides an overview of office facilities, including size and equipment, that will together comprise the three separate field offices. The Contractor shall submit to the Engineer for approval, no later than 14 days after commencement date, layout drawings with the corresponding entries and designations.

Room	Size	Furniture
Meeting Room 1 No.	$\geq 30 \text{ m}^2$	10 conference tables each 1,20 m x 0,80m 20 armchairs 10 chairs 1 white board, 1,50 m x 1,00 m 4 bookshelves, 1 m x 2 m, 30 cm deep 2 coat racks 2 waste baskets
Office Type 1 3 No.	$\geq 12 \text{ m}^2$	Each: 1 desk $\geq 4 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 1 chair with rolling casters 2 swivel chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 1 waste basket
Office Type 2 3 No.	$\geq 16 \text{ m}^2$	Each: 2 desks $\geq 3 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 2 desk chairs 2 office chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 2 waste baskets
Office Type 3 AutoCAD	$\geq 12 \text{ m}^2$	2 Desk $\geq 3 \text{ m}^2$ , with file drawer and drawers, all lockable incl. keys 1 low table $\approx 1 \text{ m}^2$ 2 desk chairs

Room	Size	Furniture
and Video Control 1 No.		2 office chairs 2 bookshelves, 1 m x 2 m, 30 cm deep 1 coat rack 2 waste baskets
Kitchen 3 No.	$\geq 6 \text{ m}^2$	1 sideboard 2 cupboards 0.8x0.6x0.3 m 2 boilerplates 1 electrical water boiler 1 refrigerator/freezer combination volume min. 270 l. 1 waste bucket 1 coffee machine, Espresso 2 Hot/cold water dispenser cups, saucers, plates, knives, forks and spoons, teapot all to serve 12 persons
Toilet 6 No.	$3 \text{ m}^2$	Each: western W.C suite toilet roll holder wash hand basin mirror towel rail soap dispenser
Shower room 3 No.	$3 \text{ m}^2$	standard shower towel rail soap dispenser mirror
Hall 3 No.		2 fire extinguishers, wall mounted 4 first aid kits

#### 4. Office Equipment Specifications

Desk	Desk board 25 mm thick covered with MDF Table depth: throughout 1000 mm Work height: 750 mm Units locked shelf covered by natural MDF with 2 drawers could be placed under the table The feet shall be chromium coating
Desk Chair	Pneumatic Seat Height Adjustment 360° Swivel Tilt Tension Adjustment Tilt Lock Mechanism Seat board shall have minimum 10 cm thickness Backboard shall be concave polypropylene to meet body ergonomic
Office Chair	Pneumatic Seat Height Adjustment 360° Swivel Tilt Tension Adjustment Backboard shall meet body ergonomic
Bookshelf	Bookshelf min. 25 mm thick covered with MDF Dimensions 1 m x 2 m, 30 cm deep Min 3 open and 3 lockable shelves
Sideboard	Min. 25 mm thick covered with MDF Dimensions 2.0x0.8x0.6 m with tap + sink upper side of kitchen working

#### 5. Fire Extinguishers

- a. Wall mounted hand operated fire extinguishers shall be of the all-purpose, nitrogen pressured, dry chemical type. Fire extinguishers shall be provided at each site during construction. The fire extinguishers shall meet international industrial standards and shall be 10 kg and the color of the shell shall be red. Wall mounting brackets shall be furnished. Two fire extinguishers shall be installed in the Engineer's field offices to be used for this Contract.

## 6. First Aid

- a. The Contractor shall provide and maintain at own expense at the Sites, adequate and easily accessible first-aid kits and facilities for treatment of accidents during the execution of the Works under the Contract and such outfits as may be required under any relevant laws, bylaws, ordinances and regulations in force. The places where these items are kept shall be prominently marked.
- b. Contractor staff shall include employees trained and fully qualified in the use of first aid, duly identified and designated and made known to all employees by posting their names and first aid qualifications in a prominent location at the Sites. The Contractor shall ensure that a person trained in first aid is available at the Works sites, at Temporary Facilities, and at the Engineer's offices.
- c. Any order from the Engineer to renew first aid materials, extend the supply of first aid materials and kits, or increase the number of first aid trained staff, shall be promptly carried out.
- d. First aid kits shall be required at Temporary Facilities, Field offices and in each vehicle.

## 7. Heating and Cooling

- a. The Contractor shall provide electrical heating and cooling system for all rooms and halls. The system must be capable of maintaining reasonable office temperature during the coldest winter months.

## 8. Office and Field Equipment

- a. The Contractor shall provide, equip, and maintain on site the following for the sole use of the Engineer and the Employer until the end of the contract:

Notebook, 15,6" FHD IPS, Intel i7-8565U latest generation, 32GB RAM, 1000 GB SSD + 1TB HDD, MX250, Win10 latest version, MS 365	6 No
External Solid-State Drive, 1 TB, USB 3.1	4 No
Multifunction Color Laser Printers (Printer, Fax, Photocopy, Scanner)	2 No
Projector - Full HD, 4000 ANSI Lumen, 10.000:1 Contrast, WLAN, HDMI	1 No
Digital Camera, not less than 20 MP	2 No
Tablet, Weatherproof, anti-shock, 10-inch, 64 GB, Cellular + WIFI	6 No
Video Camera for surveillance, higher than 4MP, night vision, weatherproof, movable, zooming function, to be installed in the locations approved by the Engineer to provide an overview of the complete construction site and temporary facilities with internet connection, fully	10 No



controlled remotely by the Engineer, local storage capacity for recording of all cameras for 24 hours/day for at least 30 days. Emergency power supply (UPS) suitable for supplying the surveillance system for at least 12 hours in case of power loss.	
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- b. Latest versions of MS Office, Anti-Virus Software with automatic update subscription software package will be provided for each computer.
- c. All above equipment shall be provided in the still sealed manufacturer's packaging and the Engineer shall retain exclusive admin rights for the duration of the project.
- d. The Contractor shall provide and maintain the following for the exclusive use of the Employer and Engineer's Representative and his staff for checking the setting-out and levels of the work:

Survey Instrument set (Electronic distance meter) and accessories	3 No
Theodolite	3 No
Total Station	3 No
30 m steel measuring tapes graduated in millimeters and centimeters	9 No
5 m steel measuring tapes	9 No
Surveying supplies as needed including pegs, steel rods and angles, ranging rods, concrete, paint etc.	As needed

#### 9. Personal Protection Equipment

- a. The Contractor shall provide the following clothing for the exclusive use of the Employer and Engineer and his staff:

Safety helmets	15 No
High Visibility Vests	15 No
Waterproof coats color yellow in assorted sizes (to be specified) complete with belt, over trousers and hat, separate winter warm liners, obtained from an approved supplier.	15 No
Pairs of rubber safety wellingtons in assorted sizes (to be specified)	15 No
Pairs of safety boots in assorted sizes (to be specified)	15 No

#### 10. Miscellaneous Requirements

- a. Consumables – the Contractor shall supply fax/photocopy paper (A4 and A3 sizes), ink and toner replacements, DVD's and CD's, towels, soap, toilet paper, disinfectant, cleaning materials and required maintenance consumables.
- b. Ownership – the Employer and Engineer's field offices shall be new and shall remain the permanent property of the Contractor. The contents of the Field Offices including all specified furniture, service fittings and equipment shall be new and shall be returned to the Contractor on termination or completion of the Contract.

- c. Governing Standards – the field offices shall be designed, built, and installed in compliance with all applicable plumbing, electrical, structural, etc., codes in effect for Mongolia.
  - d. Handling – all electronic equipment and office furnishings shall be handled in a manner that will prevent damage. Any damaged item found after receipt and prior to the Employer and Engineer's acceptance of the item will be replaced or repaired by the Contractor as recommended by the Engineer.
  - e. Equipment Warranty – all equipment shall be provided with the manufacturer's standard warranty.
  - f. Maintenance – the Contractor shall make any required and scheduled (as recommended by the manufacturer) maintenance and repairs to the field offices and their contents during the period of this Contract. The Contractor shall clean the field offices at least daily, unless directed by the Engineer that cleaning is required more frequently, and all trash shall be collected and removed daily to a proper disposal point.
  - g. Acceptable Manufacture – the Contractor shall provide a detailed layout of the field offices to be approved by the Engineer prior to fabrication.
  - h. Installation – the field offices and all equipment shall be set up at locations indicated by the Employer and the Engineer and in accordance with the manufacturers' recommendations and local codes. The Employer and Engineer's field offices shall be at locations adjacent to the site of the Contractor's offices, nominated by the Contractor and approved by the Employer and Engineer. If not already existing, all-weather roads to the field offices shall be provided by the Contractor. Adjacent to the field offices, a graveled parking area with car parking suitable for at least 8 vehicles in all-weather shall be provided and maintained by the Contractor
  - i. Communications Systems - the Contractor shall make all necessary arrangements and pay all installation charges for telephone lines in offices at the Sites and 2 separate telephone lines in the offices of the Employer and Engineer and shall provide a self-answering fax and a switchboard suitable for 5 separate extensions together with an extension and telephone instrument for each room as registered consumer. The telephone service and instruments in the Employer and Engineer's office shall be a touch tone system if locally available. In addition to the office telephone system the Contractor shall provide 5 no. mobile telephones for the Employer and Engineer including line and machine. The telephone and fax services shall be in the name of Contractor, and all charges, including calls and maintenance after installation shall be billed to and paid by the Contractor. Also, wireless connection will be available for Employer, Engineer, and other personnel in temporary facilities
  - j. Temporary Sanitary Facilities – the Contractor shall provide, furnish, and maintain temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work on site.
5. Vehicles for the Employer and Engineer
- a. General

- i. Within 30 days after Effective Date, the Contractor shall provide two vehicles and the Employer will allocate them for the exclusive use of this work for the duration of the Contract. All costs incurred for supply and maintenance of these vehicles will be reimbursed under the Contract.
  - ii. In the event of failure to supply vehicles within the time specified, the Employer reserves the right to provide such vehicles as are necessary until such time as the specified vehicles are made available. Cost incurred for provision and maintenance of these vehicles will be deducted from monies due or to become due to the Contractor.
  - iii. The vehicles will be subjected to severe operating conditions in climate ranging from hot to extreme cold environment.
  - iv. The Contractor shall submit for review, technical literature, and specifications in sufficient detail to identify and describe the vehicles and all options proposed.
  - v. The vehicles shall be new and shall be either leased or purchased. Upon completion or termination of the Contract, the vehicles shall be returned to the Contractor. The vehicles shall be suitable for the Mongolian climate and use locally available fuel.
  - vi. The Contractor shall provide for all operating and maintenance costs required to ensure that all vehicles are in good, safe and legal operating condition including taxes, comprehensive insurances to cover use at all times, and driving by drivers provided by the Contractor, and the Employer, the Engineer, other Employer's Representatives and staff and any other drivers designated, licenses, fuel, spare parts, lubricants, preventative maintenance, and repairs. In the event of a breakdown or accident, the Contractor shall furnish a replacement vehicle within 24 hours.
  - vii. The Contractor shall provide approved competent, licensed drivers for those vehicles designated by the Employer for his use during working hours, for any duration, and including any overtime or weekend work when required by the Employer, to all places related to the Work as directed by the Employer. The drivers will generally be required to work site hours, or other times when work is being carried out on site.
- b. Vehicle Types
- i. The vehicles to be provided for the Engineer shall be: 2 No, 4WD vehicles.
- c. Vehicles General Description
- i. The vehicles (SUV type) and accessory equipment installed or furnished shall be the latest locally available improved models in current production at time of delivery. They shall be the standard production models offered to commercial firms and shall be of new manufacture, including all parts, components, and accessory items.

- ii. Parts and components not specifically mentioned in this specification, but which are required to provide a complete vehicle or to comply with any Mongolian Law, shall be included as a part of the equipment to be furnished.
  - iii. Vehicles shall include project-specific signage as well as safety flags, to readily identify these as vehicles authorized on the site of Works, and for operators of heavy equipment to readily identify the presence of a passenger vehicle.
- d. Vehicles Additional Requirements
- i. The vehicles shall have differential, brakes, suspension, wheels, tires, and other component parts necessary to give maximum performance, service, life, and safety, and not merely meet minimum requirements of the Specification. The engine capacity shall be minimum 2500 cc.
  - ii. The vehicles shall have ABS Brakes Air Conditioning, Central Locking, Electric Windows, Inertia reel seatbelts, airbags.
  - iii. Vehicles shall be equipped with spare tire with wheel, snow chains, jack, jack handle, lug wrench and other tools required for emergency maintenance, and operations manual.
- a.

## 2.02 INTERNET SERVICE

- A. The Contractor shall provide separate internet lines for access from the Engineer's Field Offices, based on the following:
- 1. A connection of 8Mbps,
  - 2. A dedicated Microwave internet connection equivalent to a fiber connection of 8 Mbps.
  - 3. A 30 Mbps ADSL connection or a 16 Mbps dedicated corporate.

The Internet Service Provider (ISP) service shall be for the exclusive use of the Engineer and Owner's personnel and shall be separate and in addition to internet service used by the Contractor. The line shall also be separate and in addition to the telephone service line specified herein. In such cases where there is no required cable internet service available, the Contractor shall provide an equivalent. Contractor will be responsible for renewal costs and all associated fees until issuance of Taking-Over Certificate Final Acceptance Certificate. Contractor shall obtain and pay for a service and repair contract with a local representative of the internet services dealer or manufacturer for weekly on-site visit.

## 2.03 TELEPHONE SERVICE

- A. Within 30 days after the date of the Notice to Proceed, the Contractor shall provide in all Field Offices a telephone system, in good working order, at the conference desk for the use of the Engineer's and Owner's employees in connection with the Works. The line shall be separate and in addition to the telephone service used by the Contractor. Contractor will be responsible for renewal.
- B. All telephone service charges shall be paid by the Contractor for the duration of the Contract.

- C. Service Contract: The Contractor shall obtain and pay for a service and repair contract with a local representative of the telephone services dealer or manufacturer for weekly on-site visit.

## 2.04 OTHER

### A. Attendance Upon the Employer and Engineer's Representative:

- 1. The Contractor shall provide qualified personnel to assist the Employer and Engineer in conducting all field tests. The Contractor shall provide for such labor as is reasonably necessary to attend to the office requirements, clean the instruments and assist the Employer and Engineer in measuring, supervising, checking, testing, examining or setting out the Contractor's Work in any way whatsoever at any time of day and night. All assistance shall be provided under the direct supervision of the Engineer.

### B. Nameboards

- 1. The Contractor shall provide, erect and maintain until completion of the Contract nameboards at the entrance to each Site bearing the Employer's and Engineer's names, the name of the project, the Contractor's name and such other names and information as the Employer and the Engineer may direct. The Contractor shall submit the design of the nameboards for the Employer and Engineer's approval prior to fabrication and erection. The nameboards are to be not less than 3m x 2m and written in the English and Mongolian languages.

### C. Bilingual Secretary and Supporting Staff

- 1. The Contractor shall employ for the exclusive use of the Employer and Engineer an approved bilingual (English-Mongolian) typist/secretary to work in the Engineer's field office on a full-time basis. The primary role of the secretary will be to coordinate and facilitate the work between Employer/Engineer and the Contractor, including organizing inspection dates for the Contractor and coordinate with Contractor during inspections by the Engineer.
- 2. The Contractor shall provide qualified personnel to assist the Employer and the Engineer in conducting all field tests. The Contractor shall provide for such labor as is reasonably necessary to attend to the office requirements, clean the instruments and assist the Employer and Engineer in measuring, supervising, checking, testing, examining or setting out the Contractor's Work in any way whatsoever at any time of day and night. All assistance shall be provided under the direct supervision of the Engineer.

## 2.05 TEMPORARY FENCE

### A. Temporary Perimeter Fencing

- 1. Temporary perimeter fencing is to be supplied and installed by the General Contractor, to enclose and secure the field offices, while providing screening of construction activities.
- 2. Temporary fence shall be 2.4 meters (8 feet) above grade. All fence panels shall align with adjacent panels along top.

3. Fencing metals to be low sheen black finish, 60 mm (2 3/8") galvanized posts with 11 gauge chain link fencing, 41 mm (1 5/8") top and bottom rail. All fencing is to have screening fabric, attached with galvanized metal heavy gauge wire clips, black color.
4. Screening fabric shall be knitted polyethylene cloth, with reinforced band and grommets along top and sides for secure anchoring to chain link panels.
5. Embed fence posts securely a minimum of 0.6 meter (2 feet) into ground whenever possible to avoid tipping from wind load. Posts to be installed at 2.4 meters (8 feet) on center. Fence posts may be installed on concrete blocks if frequent relocation is anticipated, and if approved by the Engineer. Pull fabric tight and smooth, overlap grommets and clip together if fence fabric ends between posts. Metal wire clips to be used in all grommets, crimped tight.

## PART 3 - EXECUTION

### 3.01 POTABLE WATER

- A. A new freestanding self-contained bottled water cooler shall be provided in the field offices. The unit shall accept a 20 liter or equivalent "bottled water" bottle or equivalent to be furnished and serviced by the Contractor.
- B. Two additional 20-liter bottles of water shall be stockpiled on site, and additional bottles of water shall be provided so that the supply is uninterrupted throughout the Work.

### 3.02 ELECTRICITY

- A. Arrange for, furnish and maintain all expenses for all electricity required for proper lighting, heating, cooling and powering of the field offices to the time of final acceptance of the Work. Contractor shall be responsible for payment of electric power utility use charges over the period between start-up of utility service and final acceptance of the Work.
- B. Furnish all wiring, fixtures, lamps and other accessories required for his or his subcontractors' work, and for proper lighting, the use of power tools and for temporary heat for construction operations up to the time of final acceptance. Power shall be obtained directly from power company lines or from portable, gasoline or diesel driven generator sets.
- C. Temporary connections for electricity shall be subject to approval of the power company representative and shall be removed in like manner at the Contractor's expense prior to final acceptance of the Work.
- D. Wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. Electrical facilities shall conform to the requirements of local electric utility providers.

### 3.03 SANITARY CONVENIENCES

- A. Provide sanitary conveniences for the duration of the project for the use of all persons employed on the project, including all other contractors and subcontractors. Separate facilities shall be provided for male and female employees.



- B. Sanitary conveniences shall be properly screened from public observation, provided in sufficient numbers, and in such manner and at such points as shall be approved by the Engineer and/or Owner. The contents shall be removed and legally disposed of at a frequency acceptable to the public health agency having jurisdiction or as required.

#### 3.04 PROJECT SIGNS

- A. Contractor shall provide Project Sign(s) in accordance with MCA Requirements.

#### 3.05 BARRICADES AND GUARD LIGHTS

- A. Barricades, signs, fences and similar safety and warning devices shall be provided as required, in order to ensure the protection of employees and others concerned with their duties and presence on the premises at the project site.
- B. Provide and maintain guard lights at all barricades, obstructions in plant ways, and at all trenches and pits adjacent to traveled ways.

#### 3.06 TEMPORARY HEAT

- A. During the months of October through April, provide heat, fuel and services necessary to protect the field offices against damaged from dampness and cold and to maintain temperature above 13 °C (55 °F). Only approved equipment specifically designed for the purpose shall be used. Open salamanders will not be allowed.
- B. The permanent heating system may be used for temporary heat prior to the occupancy of the Well Pump Houses by the Owner, or as otherwise approved by the Engineer, however, the use of permanent equipment for temporary heat purposes shall not affect the guarantee period stated elsewhere in these specifications. Operate and maintain the temporary heating system (including fuel) and the equipment used for temporary heat until final completion of the project, and repair and replace all items damaged during temporary use. Clean all of the permanent heating equipment if it is used for temporary heat before turning the system over to the Owner. Contractor shall be responsible for payment of the district hot water utility use charges over the period between start up of utility service and final acceptance of the project.

#### 3.07 TEMPORARY CLOSURES

- A. Temporary doors and closures for all openings shall be furnished and installed to keep out inclement weather and intruders until the permanent units are installed. Any loss or damage caused by failure to comply with the above provisions shall be replaced and/or repaired at no additional cost to the Owner.

#### 3.08 SHELTER AND PROTECTION OF MATERIALS

- A. Provide adequate storage facilities for all materials required for the Work. The facilities shall be enclosed, heated and provided with moisture control, as required to provide adequate protection and shall be satisfactory to the Engineer.

#### 3.09 SECURITY

- A. Contractor shall be responsible for protection of the Site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons.

- B. No Claim shall be made against Owner by reason of any act of an employee or trespasser, and Contractor shall make good all damage to Owner's property resulting from Contractor's failure to provide security measures as specified.
- C. Security measures shall include security fencing, barricades, lighting, and other measures as required to protect the Site. Additionally, the Contractor shall engage a guard service to furnish uniformed watchmen at each Site during all non-working hours twenty-four hours a day, seven days a week.
- D. The Contractor shall do the following for Site entry control: restrict entry of unauthorized persons and vehicles into Site and existing facilities; allow entry only to authorized persons with proper identification; maintain log of workmen and visitors and make log available to Owner on request; coordinate access of Owner's personnel to Site.

END OF SECTION

## SECTION 01568 (CP-1)

EROSION CONTROL, SEDIMENTATION AND  
CONTAINMENT OF CONSTRUCTION MATERIALS

## PART 1 – GENERAL

## 1.01 DESCRIPTION:

- A. Provide all work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any stream or wetlands.
- B. Attention is directed to the SECTION VII GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 REFERENCE:

- A. "Guide-lines for Erosion and Sediment Control, Planning and Implementation" and "Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity", published by the United States Environmental Protection Agency.

## 1.04 SUBMITTALS:

- A. Two weeks prior to the start of the work, submit to Engineer, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

## 1.05 QUALITY ASSURANCE:

- A. All work shall be performed in accordance with all applicable Government and Local regulations and permits associated with the project.
- B. Sedimentation and erosion control best management practices shall be installed, at a minimum, as approved by Engineer, and prior to the start of any clearing of vegetation or excavation of materials, to protect waterbodies or wetlands in the vicinity of the project.
- C. Additional erosion control shall be implemented as necessary in the event that the erosion and sedimentation control system as shown on the plans is not sufficient

enough to protect erosion or sedimentation to nearby wetlands as a result of contractors means and methods for restoration activities.

- D. The sedimentation and erosion control system shall be maintained fully functional and shall not be removed until disturbed areas are stabilized by seeding, natural establishment or other means necessary as directed by the Engineer.
- E. All stockpiled materials shall be located in designated upland portions of the site and shall not impact waterbodies and wetlands in the vicinity of the project.
- F. Use acceptable procedures, including use of water diversion structures, diversion ditches, settling basins, and sediment traps.
- G. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- H. If construction materials are washed away during construction, remove materials from fouled areas.
- I. Stabilize diversion outlets by means acceptable to Engineer.
- J. Engineer has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment basins, sediment traps, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

## PART 2 – PRODUCTS

### 2.01 BALES:

- A. Straw or other suitable material acceptable to Engineer.

### 2.02 WOOD STAKES:

- A. 50 mm x 50 mm x 0.9 m (2 in. by 2 in. by 3 ft).

### 2.03 SYNTHETIC FILTER FABRIC:

- A. Synthetic filter fabric to be a pervious sheet of propylene, nylon, polyester or ethylene filaments and shall be certified by the manufacturer or supplier as conforming to the following requirements:

<u>Physical Property</u>	<u>Requirements</u>
Filtering Efficiency	75% (min.)
Tensile Strength at 20% (max.) Elongation	Extra Strength – 900 kg/m minimum (50 lbs./lin. In).

Standard Strength –  
540 kg/m minimum (30 lbs./lin. in.)

Flow Rate 12 L/m<sup>2</sup>/min minimum (0.3 gal./sq. ft./min)

- B. Burlap to be 340 gram/m<sup>2</sup> fabric (10 ounce per square yard).
- C. Posts or stakes for filter fences either 50mm x 50mm or 50mm x 76mm or 50mm x 102mm (2 x 2 or 2 x 3 or 2 x 4 inch) studs or 0.74 kg (minimum) per linear meter (0.5 pounds (minimum) per linear foot).

#### 2.04 FILTERING DEVICE:

- A. Filtering device as approved by the Engineer, shall meet the following minimum specifications:

<u>Physical Property</u>	<u>Requirements</u>
Total Suspended Solids Removal	78%
Tensile Strength	180 kPa (26 psi)
Flow Rate	140 l/min/m (11.3 gal/min/ft)
Density	48 kg/m (32 lbs/ft)

Compost media shall not contain noxious non-native weed seeds or other invasive plant parts (roots, rhizomes, etc.). For areas where filtering device is proposed to remain permanently, device may be seeded at the time of installation with a seed mix approved by the Engineer.

#### 2.05 CATCH BASIN SEDIMENTATION CONTROL:

- A. Provide and maintain filtering device, or equivalent product as approved by the Engineer, at each existing and newly installed catch basin throughout duration of construction.

#### 2.06 FENCING

- A. Woven wire fabric fencing shall be galvanized, mesh spacing of 150 millimeters, maximum 1.62-millimeter diameter wire, at least 800 millimeters tall.

#### 2.07 FASTNERS

- A. Fasteners to wood posts shall be steel, at least 40 mm long.

### PART 3 – EXECUTION

### 3.01 GENERAL:

- A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water or into natural or man-made channels.
- B. Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as directed by Engineer. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.

Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.

### 3.02 INSTALLATION:

- A. Install sediment and erosion controls in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.
- B. Install checks immediately before site is cleared and before trench excavation. Locate checks, surrounding stored material, approximately 2m (6 ft.) from material.
- C. Hold silt socks in place with two 50 mm by 50 mm by 1 m (2 in. by 2 in. by 3 ft.) stakes so that each bale is butted tightly against adjoining bale thereby precluding shortcircuiting of erosion check.
- D. Construct earth berms or diversions to intercept and divert runoff water from critical areas.
- E. Discharge silt-laden water from excavations onto filter fabric mat and/or baled hay or straw sediment traps to ensure that only filtered water is returned to watercourses.
- F. Do not place excavated soil material adjacent to water-course in manner that will cause it to wash away by high water or runoff.
- G. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge area.
- H. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.
- I. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.
- J. Do not pump silt-laden water into surface waters, streams, wetlands, or natural or man-made channels leading thereto.



- K. Prevent damage to vegetation adjacent to or outside of construction area limits.
- L. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wetlands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.
- M. Do not alter flow line of any stream unless indicated or specified.

END OF SECTION

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## SECTION 01568 (CP-2, CP-3)

EROSION CONTROL, SEDIMENTATION AND  
CONTAINMENT OF CONSTRUCTION MATERIALS

## PART 1 – GENERAL

## 1.01 DESCRIPTION:

- A. Provide all work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any stream or wetlands.
- B. Attention is directed to the SECTION VII GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 REFERENCE:

- A. "Guide-lines for Erosion and Sediment Control, Planning and Implementation" and "Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity", published by the United States Environmental Protection Agency.

## 1.04 SUBMITTALS:

- A. Two weeks prior to the start of the work, submit to Engineer, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

## 1.05 QUALITY ASSURANCE:

- A. All work shall be performed in accordance with all applicable Government and Local regulations and permits associated with the project.
- B. Sedimentation and erosion control best management practices shall be installed, at a minimum, as approved by the Engineer and as shown on the Drawings, and prior to the start of any clearing of vegetation or excavation of materials, to protect waterbodies or wetlands in the vicinity of the project.
- C. Additional erosion control shall be implemented as necessary in the event that the erosion and sedimentation control system as shown on the plans is not sufficient

enough to protect erosion or sedimentation to nearby wetlands as a result of contractors means and methods for restoration activities.

- D. The sedimentation and erosion control system shall be maintained fully functional and shall not be removed until disturbed areas are stabilized by seeding, natural establishment or other means necessary as directed by the Engineer.
- E. All stockpiled materials shall be located in portions of the site approved by the Engineer and shall not impact waterbodies and wetlands in the vicinity of the project.
- F. Use acceptable procedures, including use of water diversion structures, diversion ditches, settling basins, and sediment traps.
- G. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- H. If construction materials are washed away during construction, remove materials from fouled areas.
- I. Stabilize diversion outlets by means acceptable to Engineer.
- J. Engineer has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment basins, sediment traps, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

## PART 2 – PRODUCTS

### 2.01 BALES:

- A. Straw or other suitable material acceptable to Engineer.

### 2.02 WOOD STAKES:

- A. 50 mm x 50 mm x 0.9 m (2 in. by 2 in. by 3 ft).

### 2.03 SYNTHETIC FILTER FABRIC:

- A. Synthetic filter fabric to be a pervious sheet of propylene, nylon, polyester or ethylene filaments and shall be certified by the manufacturer or supplier as conforming to the following requirements:

<u>Physical Property</u>	<u>Requirements</u>
Filtering Efficiency	75% (min.)
Tensile Strength at 20% (max.) Elongation	Extra Strength – 900 kg/m minimum (50 lbs./lin. In).

Standard Strength –  
540 kg/m minimum (30 lbs./lin. in.)

Flow Rate 12 L/m<sup>2</sup>/min minimum (0.3 gal./sq. ft./min)

- B. Burlap to be 340 gram/m<sup>2</sup> fabric (10 ounce per square yard).
- C. Posts or stakes for filter fences either 50mm x 50mm or 50mm x 76mm or 50mm x 102mm (2 x 2 or 2 x 3 or 2 x 4 inch) studs or 0.74 kg (minimum) per linear meter (0.5 pounds (minimum) per linear foot).

#### 2.04 FILTERING DEVICE:

- A. Filtering device as approved by the Engineer, shall meet the following minimum specifications:

<u>Physical Property</u>	<u>Requirements</u>
Total Suspended Solids Removal	78%
Tensile Strength	180 kPa (26 psi)
Flow Rate	140 l/min/m (11.3 gal/min/ft)
Density	48 kg/m (32 lbs/ft)

Compost media shall not contain noxious non-native weed seeds or other invasive plant parts (roots, rhizomes, etc.). For areas where filtering device is proposed to remain permanently, device may be seeded at the time of installation with a seed mix approved by the Engineer.

#### 2.05 CATCH BASIN SEDIMENTATION CONTROL:

- A. Provide and maintain filtering device, or equivalent product as approved by the Engineer, at each existing and newly installed catch basin throughout duration of construction.

#### 2.06 FENCING

- A. Woven wire fabric fencing shall be galvanized, mesh spacing of 150 millimeters, maximum 1.62-millimeter diameter wire, at least 800 millimeters tall.

#### 2.07 FASTNERS

- A. Fasteners to wood posts shall be steel, at least 40 mm long.

### PART 3 – EXECUTION

### 3.01 GENERAL:

- A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water or into natural or man-made channels.
- B. Soil and sedimentation control measures consisting of silt fence and filtering device or equivalent approved by the Engineer shall be placed in areas as depicted on Drawings. Modifications to the location of perimeter filtering devices shall be approved by the Engineer. Filtering devices shall be installed prior to ground disturbance. Erosion and sediment controls to be placed surrounding the base of all deposits of stored and/or excavated materials and topsoil.

Following work in an area, disturbed ground shall be stabilized as soon as practicable. In areas of the site where construction activities have temporarily or permanently ceased, stabilization measures shall be initiated within 7 days.

### 3.02 INSTALLATION:

- A. Install sediment and erosion controls in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.
- B. Install checks immediately before site is cleared and before trench excavation. Locate checks, surrounding stored material, approximately 2m (6 ft.) from material.
- C. Hold silt socks in place with two 50 mm by 50 mm by 1 m (2 in. by 2 in. by 3 ft.) stakes so that each bale is butted tightly against adjoining bale thereby precluding shortcircuiting of erosion check.
- D. Construct earth berms or diversions to intercept and divert runoff water from critical areas.
- E. Discharge silt-laden water from excavations onto filter fabric mat and/or baled hay or straw sediment traps to ensure that only filtered water is returned to watercourses.
- F. Do not place excavated soil material adjacent to water-course in manner that will cause it to wash away by high water or runoff.
- G. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge area.
- H. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.
- I. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.
- J. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, or natural or man-made channels leading thereto.



- K. Prevent damage to vegetation adjacent to or outside of construction area limits.
- L. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wetlands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.
- M. Do not alter flow line of any stream unless indicated or specified.

END OF SECTION

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## SECTION 01610 (CP-1)

## DELIVERY, STORAGE AND HANDLING

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the Work. Additional specific requirements, if any, are specified with the related item.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

## 1.04 SUBMITTALS – Not Used

## 1.05 PRODUCT HANDLING:

## A. Transportation and Delivery

1. Transport, handle and store (prior to incorporation into the Work) items in accordance with manufacturer's printed instructions.
2. Schedule delivery to reduce long term on-site storage prior to installation and/or operation.
3. Coordinate delivery with installation to ensure minimum holding time for items that are easily damaged or sensitive to deterioration.
4. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
5. All items delivered to the site shall be unloaded by the Contractor and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic. The Owner shall not offload any materials or equipment at the site.
6. Provide equipment and personnel to unload all items delivered to the site.

## B. Engineer's Inspection

1. Contractor shall promptly inspect shipments to assure that products comply with requirements, quantities are correct, and items are undamaged.

2. Contractor shall notify Engineer verbally, and in writing, immediately upon arrival of all products.
3. Engineer, with assistance of Contractor, shall inspect all well materials (well screen, well casing, pipe connections, centralizers, manufactured glass beads, processed sand for transition pack, and cement-grout well seal).
4. At a minimum, Engineer will inspect the following: condition and size (diameter) of glass beads; condition, roundness, straightness and wall thickness of well casing and well screen; condition, roundness and diameter of pipe connections; condition and size of centralizers; uniformity and size of transition pack; and weight of cement-grout.
5. Well materials that are damaged, or do not meet the specifications for size, diameter, thickness, weight, roundness, straightness, length, etc. shall not be approved by Engineer and shall not be used in well construction. Unapproved materials shall be replaced with materials that do meet Engineer's approval.

#### C. Storage and Protection

1. Store and protect products and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer. Instructions shall be carefully followed and a written record of this kept by the Contractor for each product and pieces of equipment.
2. Arrange storage of products and equipment to permit access for periodic inspection. Periodically inspect to make sure products and equipment are undamaged and are maintained under specified conditions.
3. Provide protective maintenance during storage consisting of inspecting surfaces for signs or corrosion or other damage, applying any coatings as recommended by the manufacturer and all other precautions to assure proper protection of all products stored and for compliance with manufacturers' requirements related to warranties.
4. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.
5. Comply with the requirements of SECTION 02672, Paragraph 1.10, DELIVERY, STORAGE AND HANDLING.

#### 1.06 DESIGN CRITERIA – Not Used

#### PART 2 – PRODUCTS – Not Used

#### PART 3 – EXECUTION – Not Used

END OF SECTION

## SECTION 01610 (CP-2, CP-3)

## DELIVERY, STORAGE AND HANDLING

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the work. Additional specific requirements, if any, are specified with the related item.
- B. Attention is directed to the SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

## 1.04 SUBMITTALS – Not Used

## 1.05 PRODUCT HANDLING:

- A. Transportation and Delivery
  - 1. Transport, handle and store (prior to incorporation into the work) items in accordance with manufacturer's printed instructions.
  - 2. Schedule delivery to reduce long term on-site storage prior to installation and/or operation.
  - 3. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
  - 4. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
  - 5. All items delivered to the site shall be unloaded by the Contractor and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic. The Owner shall not offload any materials or equipment at the site.
  - 6. Provide equipment and personnel to unload all items delivered to the site.

7. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

B. Storage and Protection

1. Store and protect products and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer. Instructions shall be carefully followed and a written record of this kept by the Contractor for each product and pieces of equipment.
2. Arrange storage of products and equipment to permit access for inspection. Periodically inspect to make sure products and equipment are undamaged and are maintained under specified conditions.
3. Provide protective maintenance during storage consisting of manually exercising equipment, inspecting mechanical surfaces for signs or corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer necessary for its protection and all other precautions to assure proper protection of all equipment stored and for compliance with manufacturers' requirements related to warranties.
4. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.
5. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in manner to reduce breakage, cracking and spalling to a minimum.
6. All mechanical and electrical equipment and instruments shall be covered with canvas and stored in a weathertight building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it shall be satisfactory to the Engineer. Building shall be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer and to prevent condensation on the equipment being stored.
  - a. All equipment shall be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer.
  - b. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding".



- c. Upon installation of the equipment, the Contractor shall start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
- d. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
- e. For electrical equipment (including switchgear, switchboards, motor control centers, and variable frequency drives) installed in areas where temperature and humidity are not controlled for, provide temporary heaters in accordance with manufacturer's recommendations to prevent condensation prior to energization of equipment.
- f. Prior to acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

#### C. Storage and Handling of Hazardous Materials

- 1. The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the Work.
  - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms:

Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: Diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
  - b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
  - c. The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.
  - d. The separate storage area shall be inspected by the Engineer and the local authority prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.

2. Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

1.06 DESIGN CRITERIA – Not Used

PART 2 – PRODUCTS – Not Used

PART 3 – EXECUTION – Not Used

END OF SECTION

## SECTION 01700 (CP-1)

## CONTRACT CLOSEOUT

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK:

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Closeout procedures.
  - 2. Final cleaning.
  - 3. Adjusting.
- B. Attention is directed to the SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 RELATED WORK:

- A. Warranties and Bonds are included in Section 01740.

## 1.04 CLOSEOUT PROCEDURES:

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payment, and sum remaining due.
- D. Apply for Taking-Over Certificate after Final Acceptance of Commissioning in accordance with the contract

## 1.05 FINAL CLEANING:

- A. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

1. Remove labels that are not permanent labels.
2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

1.06 ADJUSTING:

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION

## SECTION 01700 (CP-2, CP-3)

## CONTRACT CLOSEOUT

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK:

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Closeout procedures.
  - 2. Final cleaning.
  - 3. Adjusting.
- B. Attention is directed to the SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 RELATED WORK:

- A. Operation and Maintenance Data are included in Section 01730.
- B. Warranties and Bonds are included in Section 01740.

## 1.04 CLOSEOUT PROCEDURES:

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payment, and sum remaining due.
- D. Apply for Taking-Over Certificate after Final Acceptance of Commissioning in accordance with the FIDIC contract, clause 10.1 and 10.2.

**1.05 FINAL CLEANING:**

- A. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
  - 1. Remove labels that are not permanent labels.
  - 2. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
  - 3. The installing Subcontractor shall wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
  - 4. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface. Ensure that no hazardous material or waste remain on the site.

**1.06 ADJUSTING:**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION



## SECTION 01710 (CP-2, CP-3)

## CLEANING

## UP

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all cleaning up the project sites, as specified herein, and as shown on the drawings.
1. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
  2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
  3. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which it has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by its operations in a neat and satisfactory condition.
  4. The Contractor shall thoroughly clean all materials and equipment installed by the Contractor and its sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
  5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.
  6. Ensure that all hazardous material and waste has been removed from the project site.

- B. Attention is directed to the SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

#### 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

#### 1.03 DEFINITIONS:

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

#### 1.04 DESIGN CRITERIA:

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

### PART 2 - PRODUCTS – Not Used

### PART 3 - EXECUTION

#### 3.01 CONTRACT CLOSEOUT:

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT.

END OF SECTION

## SECTION 02100 (CP-2, CP-3)

## SITE PREPARATION

## PART 1 - GENERAL

## 1.01 SCOPE:

- A. The work of this section includes all labor, equipment, tools, and materials necessary for the performance of all operations in connection with clearing and grubbing, and the removal of pavement, curbing and all incidental and appurtenant work pertaining thereto, as specified herein, and as shown on the drawings.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 DESIGN CRITERIA:

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

## 1.04 SPECIAL REQUIREMENTS:

- A. Prior to the performance of any work of this section or any related work required by other sections of the specifications, the Limit of Work Line shall be laid out and staked in the field by the Contractor, according to the drawings. The Contractor shall be responsible for maintaining the Limit of Work Line during the construction operation.
- B. At all times throughout the duration of this contract, the Contractor shall be responsible for the appearance and condition of the area within and surrounding the project site. The Contractor shall repair or replace, at no additional expense to the Owner, any structures, either natural or man-made such, as but not limited to, utilities, trees, plants, water bodies, and pavements that are damaged or destroyed by any actions or sequences of events related to the Contractor's operations.
- C. Any existing plant materials designated to be saved, protected and/or undisturbed, that are cut or damaged without prior approval of the Engineer, shall be replaced in kind and size

by the Contractor, at no expense to the Owner. If the Engineer agrees that tree replacement is impossible or impractical, the Contractor shall pay the Owner damages of equivalent amount in MNT established by District Landscaping Service Department for such cases.

- D. Disposal of waste/surplus materials may involve securing permits, licenses, or approvals, which may vary according to the type of material to be disposed of prior to the start of construction. The Contractor shall apply for these, as they may be required by the various governing agencies and pay all required fees. The Contractor shall have sole responsibility for the legal disposal of all waste surplus material of this project. The Contractor shall be responsible for any and all fines due to any illegal activity with regards to the disposal of waste/surplus materials.
- E. Contractor must inform the Owner if there were any archeological findings found during site preparation and stop the work immediately.

## PART 2 - PRODUCTS – Not Used

## PART 3 - EXECUTION

### 3.01 GENERAL REQUIREMENTS:

- A. All graded areas, and all areas within the Limit of Work Line on which proposed work is to be installed, shall be cleared and grubbed as indicated on the drawings.
- B. The Contractor shall be careful to note any areas that may be designated on the drawings to receive only selective clearing and thinning.

### 3.02 CLEARING, GRUBBING, TREE AND STUMP REMOVAL:

#### A. Trees

1. Preparation of the site shall include the complete removal of all trees within the Limit of Work Line, except in those areas where selective clearing and thinning is required. Any trees within the Limit of Work Line not to be removed shall be protected from damage during clearing and construction operations by barriers or by such other methods as conditions may require. No construction materials or debris shall be stored or stockpiled, or vehicles parked or operated within the limits of the branch spread of the trees to be saved.
2. Clearing operations shall be performed in a manner which will prevent damage by falling trees to trees left standing or to structures under construction, and by methods which will provide for the safety of employees and other persons.
3. Limited clearing and thinning shall be performed in areas identified on the drawings, as required or as directed by the Engineer. This work will involve the removal of brush, small trees, dead, damaged and/or diseased trees. The Engineer will tag or otherwise mark and designate trees and brush to be saved. Where branches of trees which are to be saved interfere with the work, limbs and branches shall be trimmed off neatly and cleanly close to the bole of the tree or to main branches. Cut surfaces shall be painted with a tree wound paint. Pruning shall be done in accordance with

the District Landscaping and Servicing Department liason and only by persons experienced with this work. The Contractor shall legally dispose of all branches and limbs off site.

4. All trees, above a four-inch caliper, which are designated to be removed shall become the property of the Contractor to be disposed of by sale or otherwise, provided that such material shall be removed from the property of the Owner before the completion of the site clearance work. The Owner assumes no responsibility for the protection and safekeeping of such materials. The Contractor shall be responsible for all taxes, if any, incurred in the sale of materials.
- B. Grubbing shall consist of the grubbing up, removal and disposal of all stumps, roots larger than 36 mm (1-1/2 inches) in diameter, and matted root formations from the designated areas. All rocks or boulders near the existing surface grade, which may interfere with planned construction operations, shall be removed and disposed of as surplus/waste material, or used as fill, where specifically permitted by the Engineer.
  - C. All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it.

### 3.03 DISPOSAL OF WASTE MATERIALS:

- A. All cleared and grubbed materials shall be legally disposed of off-site by the Contractor. Burning of cleared and grubbed materials is not permitted.
- B. All waste materials shall be legally disposed of off-site by the Contractor.

### 3.04 SEDIMENT AND EROSION CONTROL:

- A. The Contractor shall take such actions as may be required to ensure that his construction activities do not interfere with or adversely impact the hydraulic characteristics or aesthetic qualities of any natural or manmade watercourse or drain.
- B. The Contractor shall provide acceptable siltation control devices such as straw bales and/or straw wattles sediment control devices; control basins for the settling and filtering of fine sands, silts and clay resulting from rainfall runoff or dewatering operations. Any natural areas or manmade structures which have been affected by siltation or erosion due to construction activities shall be restored to their pre-construction condition by the Contractor at no additional cost to the Owner.
- C. For more specific requirements for control of erosion and siltation, refer to SECTION 01110, ENVIRONMENTAL PROTECTION PROCEDURES.

3.05 CONTRACT CLOSEOUT:

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT.

END OF SECTION



## SECTION 02140 (CP-2, CP-3)

## DEWATERING

## PART 1 - GENERAL

## 1.01 DESCRIPTION:

- A. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:
  - 1. Lower the groundwater level.
  - 2. Lower hydrostatic pressure.
  - 3. Prevent surface water from entering the excavation during construction.
  - 4. Implement erosion control measures for disposing of discharge water.
  - 5. Provide and monitor observation wells and geotechnical instrumentation as specified.
- B. Groundwater within the excavation area shall be lowered to at least 60 cm below the lowest excavation levels as specified and as indicated.
- C. Common dewatering methods include, but are not limited to, sump pumping, deep wells, well points, vacuum well points or any combinations thereof.
- D. The discharge shall be released in accordance with all applicable regional, municipal, and local regulations. The Contractor shall be solely responsible for any claims arising from the discharge.

## 1.02 RELATED WORK:

- A. Section 01568: Erosion Control, Sedimentation and Containment of Construction Materials.
- B. Section 02160: Excavation Support Systems
- C. Section 02210: Earth Excavation, Backfill, Fill, and Grading
- D. Section 02223: Screened Gravel
- E. Section 02435: Crushed Stone
- F. Section 02273: Geotextile Fabric

### 1.03 SUBMITTALS:

#### A. Submit the following in accordance with Section 01300:

1. Qualification of the Contractor's dewatering specialist's or firm's qualifications a minimum of four (4) weeks prior to execution of any dewatering. The submittal shall include, but not be limited to:
  - a. Qualifications of specialist's or firm's Dewatering Design Engineer as specified in Paragraph 1.04.B.
  - b. Qualifications of specialist's or firm's field representative, as specified in Paragraph 1.04.B, who shall oversee the installation, operation and maintenance of the dewatering system.
2. Submit a dewatering plan at least two weeks prior to start of any dewatering operation. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
  - a. Dewatering and surface water control plan and details stamped and signed by a qualified Engineer.
  - b. Certificate of Delegated Design Services: Refer to Section 01300.
  - c. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.
  - d. Detailed description of dewatering, maintenance, and system removal procedures.
  - e. Monitoring plan and details, including, but not limited to, number and locations of observation wells, and geotechnical instruments such as settlement markers and piezometers, and frequency of reading the monitoring devices.
  - f. Erosion/sedimentation control measures, and methods of disposal of pumped water.
  - g. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.

- h. List of assumptions made for design of dewatering, including but not limited to groundwater levels, soil profile, permeabilities, and duration of pumping.
- 3. Measurement records consisting of observation well groundwater records and the geotechnical instrumentation readings within one day of monitoring.
- 4. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines or softening of the ground.

#### 1.04 QUALITY ASSURANCE:

- A. Comply with the requirements specified in Section 01400.
- B. Employ the services of a dewatering specialist or firm having the following qualifications:
  - 1. Have completed at least three (3) successful dewatering projects of equal size and complexity and with equal systems.
  - 2. Retain the services of a qualified Dewatering Design Engineer having a minimum of five (5) years' experience in the design of well points, deep wells, recharge systems, or equal systems.
  - 3. Retain the services of a field representative having a minimum of five (5) years' experience in installation of well points, deep wells, recharge systems, or equal systems.
- C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.
- D. Notify the Engineer immediately if any settlement or movement is detected on structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within 24 hours. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- E. If oil and/or other hazardous materials are encountered after dewatering begins, immediately notify the Engineer.

#### 1.05 DELIVERY, STORAGE AND HANDLING:

- A. Comply with the requirements specified in Section 01610.

#### 1.06 PROJECT/SITE CONDITIONS:

- A. Subsurface Conditions: Refer to Appendix A – Geotechnical Investigation Report.

## PART 2 - PRODUCTS

### 2.01 MATERIALS:

- A. Provide settlement markers, observation wells, piezometers and/or any other geotechnical instruments in accordance with the submitted dewatering plan or as specified.
- B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.
- C. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
- D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.
- F. Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
- G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- H. Provide cement grout having a water cement ratio of 1 to 1 by volume.

## PART 3 - EXECUTION

### 3.01 EXECUTION:

- A. Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.
- B. The Contractor is responsible for investigating and becoming familiar with all site conditions that may affect the Work including surface water, potential flooding conditions, level of groundwater and the time of year the work is to be done.

- C. Furnish, install and maintain dewatering system in accordance with the dewatering plan.
- D. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.
- E. At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.
- F. Do not excavate until the dewatering system is operational.
- G. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- H. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan by the Contractor's Dewatering Design Engineer and submit to the Engineer at no additional cost to the Owner.
- I. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02210 at no additional cost to the Owner.
- J. Dewatering Discharge:
  - 1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
  - 2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
  - 3. Provide separately controllable pumping lines.
  - 4. The Engineer reserves the right to sample discharge water at any time.
  - 5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- K. Monitoring Devices and Records:

1. Install, maintain, monitor and take readings from the observation wells and geotechnical instruments in accordance with the dewatering plan.
  2. Install settlement markers on structures within the zone of influence for dewatering a distance equal to twice the depth of the excavation, from the closest edge of the excavation. Conduct and report settlement surveys to 0.1 cm.
  3. For large rectangular, square or circular mass excavations the zone of influence shall be defined by the actual cone of watering influence corresponding to a 10% increase in effective vertical stress.
- L. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.
- M. Removal:
1. Do not remove dewatering system without written approval from the Engineer.
  2. Backfill and compact sumps or ditches with screened gravel or crushed stone wrapped with geotextile fabric in accordance with Section 02210.
  3. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.
- 3.02 CONTRACT CLOSEOUT:
- A. Provide in accordance with Section 01700.

END OF SECTION



Note that the primary standards referenced herein are ASTM. Subject to acceptance by the Engineer, alternative standards may be used in lieu of ASTM provided the proposed alternative is an internationally recognized standard (e.g., British Standard (BS) or local MNS Standard) that are considered similarly effective in terms of material quality and performance of the constructed product.

## SECTION 02210 (CP-1)

### EARTH EXCAVATION, BACKFILL, FILL AND GRADING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. Perform the following earth excavation, backfill, fill and grading as indicated or specified:
  - 1. Make excavations to accommodate piping, conduits, foundations and other structures.
  - 2. Provide materials for backfilling excavations and constructing embankments and fills as indicated and specified.
  - 3. Construct embankments of compacted materials.
  - 4. Grade surfaces to meet finished grades indicated.
  - 5. Immediately notify the Engineer if suspected hazardous materials are encountered and cease operations in that part of work.
  - 6. Remove boulders within the excavation limits.

##### 1.02 RELATED WORK:

- A. Section 01568: Erosion Control, Sedimentation and Containment of Construction Materials
- B. Section 02224: Bank-run Gravel
- C. Section 02225: Select Borrow

##### 1.03 REFERENCES:

- A. American Society for Testing and Materials (ASTM) Publications:
  - 1. C33: Specification for Concrete Aggregates.
  - 2. C136: Sieve Analysis of Fine and Coarse Aggregates.

3. D421: Practice for Dry Preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants.
4. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75  $\mu\text{m}$ ) Sieve.
5. D1556: Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
6. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (600  $\text{kN}\cdot\text{m}/\text{m}^3$ ).
7. D2167: Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
8. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
9. D4718: Practice for Correction of Unit Weight and Water Content for Soils Containing Oversized Particles.
10. D4944: Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Pressure Tester Method.
11. D4959: Test Method for Field Determination of Water (Moisture) Content of Soil by Direct Heating Method.
12. D5080: Test Method for Rapid Determination of Percent Compaction.
13. D6913: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
14. D6938: Standard Test method for In-Place Density and Water Content of Soil and Soil-Aggregate by nuclear Methods (Shallow Depth)
15. D7928: Standard Test Methods for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis
16. CCM 3.02.01-90: Earthwork, Footing and Foundation Work for Construction.

#### 1.04 DEFINITIONS:

- A. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- B. Proof Roll: Compaction with a minimum of 4 passes of a vibratory steel drum or rubber tire roller. Vibratory plate compactors shall be used in small areas where vibratory steel drum or rubber tire roller cannot be used. Should comply with the trial test requirement per Annex 4 of CCM 3.02.01-90.

- C. **Acceptable Material:** Material which does not contain organic silt or organic clay, peat, vegetation, wood or roots, stones or rock fragments over 15 cm in diameter, porous biodegradable matter, loose or soft fill, excavated pavement, construction debris, or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material.
- D. **Unacceptable Materials:** Materials that do not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.

#### 1.05 SUBMITTALS:

- A. Submit the following in accordance with Section 01300:
  - 1. Qualifications of the Contractor's Independent Testing Laboratory as specified in Paragraph 1.06.H, four (4) weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.
  - 2. Submit an excavation, backfilling, and filling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
    - a. Detailed sequence of work.
    - b. General description of construction methods.
    - c. Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
    - d. Details of dust control measures.
    - e. Proposed locations of stockpiled excavation and/or backfill materials.
    - f. Proposed surplus excavated material off-site disposal areas and required permits.
    - g. Details of erosion and sedimentation control measures which will prevent erosion and sedimentation during the earth moving activities.
  - 3. The following material submittals shall be submitted to the Engineer prior to backfilling and filling:
    - a. Bank-run Gravel: As specified in Section 02224.
    - b. Select Borrow: As specified in Section 02225.

- c. Other Acceptable Materials: Laboratory testing results of gradation and moisture-density relationship. Submittal shall include specific location of the source and the date when sample was taken.
- 4. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations.

#### 1.06 QUALITY ASSURANCE AND CONTROL:

- A. Comply with the requirements specified in Section 01400 and annexes 1,2 and 3 of CCM 3.02.01-90.
- B. Excavations shall be performed in the dry, and kept free from water, snow and ice during construction. Bedding and backfill material shall not be placed in water. Water shall not be allowed to rise upon or flow over the bedding and backfill material.
- C. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the local regulation requirements.
- D. Do not excavate, construct embankments, or fill until all the required submittals have been reviewed by the Engineer.
- E. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.
- F. Employ an independent testing laboratory to perform particle size and gradation analyses in accordance with ASTM D6913 and D7928, and to determine compactibility in accordance with ASTM D1557 for all the proposed backfill and fill materials, and monitoring field compaction operations. The Contractor's independent testing laboratory shall have the following qualifications:
  - 1. Have three (3) years of experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations.
  - 2. Able to provide three (3) references from previous work.
- G. Field Testing and Inspections:
  - 1. By Contractor's independent testing laboratory, acceptable to the Engineer, at Contractor's expense as specified in Paragraph 1.06.K.
  - 2. Location of tests mutually acceptable to testing laboratory and the Engineer or as directed by the Engineer.
  - 3. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional to the Owner.

4. Contractor's testing laboratory to perform inspection at least once daily to confirm lift thickness and compaction effort for entire fill area.

H. Methods of Field Testing:

1. In-Place Density: ASTM D1556, ASTM D2167, or ASTM D6938.
2. In-Place Moisture Content: ASTM D6938, ASTM D4944, or ASTM D4959.

I. Material Testing Frequency: The following testing frequencies are minimum required for all structural and non-structural fill, grading and embankment.

1. Field In-Place Density and Moisture Content - Screened gravel and crushed stone shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than one test per:
  - a. Trenches under structures foundation preparation or roadways subbase: Every 300 m per lift.
  - b. Trenches in areas without structures or roadways: Every 300 m per alternate lift.
  - c. Paved Roadways: Every 60 m per lift.
  - d. Paved Areas: 350 sq. m. per lift.
  - e. Under Structure: 100 sq. m. per lift.
  - f. Around Structures: 150 sq. m. per lift.
  - g. Embankment Fills: 1,000 sq. m. per lift.
  - h. Frequency of testing is to comply with the requirements given in Table 17 of CCM 3.02.01-90.
2. Moisture Density - One per source, except for screened gravel and crushed stone. Repeat the moisture density test for every 3,825 cubic meters of material use, and whenever visual inspection indicates a change in material gradation as determined by the Engineer.
3. Gradation Analysis - A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.
4. Liquid Limit, Plastic Limit and Plasticity Index - Minimum of one test per 3,825 cubic meters of soil for use as fill material and whenever classification of material is in doubt as determined by the Engineer.

J. Construction Tolerances:

1. Construct finished surfaces to plus or minus 2.5 cm of the elevations indicated.
  2. Grade cut and fill areas to plus or minus 6 cm of the grades indicated.
  3. Complete embankment edges to plus or minus 15 cm of the slope lines indicated.
  4. Provide the Engineer with adequate survey information to verify compliance with above tolerances.
- K. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
- L. Pipes, drains, and other utilities may exist in certain locations not indicated on the Drawings. No attempt has been made to show all services. Completeness or accuracy of information given is not guaranteed.
- M. Dig test pits considered as incidental to the normal excavation as indicated and specified in this Section, at no additional compensation.
- N. Carefully support and protect from damage, existing pipes, poles, wires, fences, curbs, property line markers, and other structures, which the Engineer determines must be preserved in place without being temporarily or permanently relocated. Should such items be damaged, restore without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.
- O. Whenever certain existing structures, as described below, are encountered, and the Engineer so directs, change the location, remove and later restore, or replace such structures, or assist the Owner in doing so. Such work to be paid for under applicable items of work, otherwise as Extra Work.
- P. In removing existing pipes or other structures, include for payment only those new materials which are necessary to replace those unavoidably damaged as determined by the Engineer.
- Q. The preceding two paragraphs apply to pipes, wires, and other structures which meet the following: (a) are not indicated on the drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer, will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.
- R. Restore existing property or structures as promptly as practicable.
- S. If material unacceptable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, remove such material to the required width and depth as directed by the Engineer and replace it with screened gravel, select borrow, or concrete.



- T. Do not remove excavation materials from the site of the work or dispose of except as directed or permitted by the Engineer.
- U. Haul away and dispose of surplus excavated materials at locations in accordance with all Federal, State and local requirements at no additional cost to the Owner.
- V. During progress of work, conduct earth moving operations and maintain work site so as to minimize the creation and dispersion of dust. Furnish and spread calcium chloride if the Engineer decides that it is necessary for more effective dust control.
- W. Provide suitable and safe bridges and other crossings where required for accommodation of travel, and to provide access to private property during construction, and remove said structures thereafter.

#### 1.07 SITE CONDITIONS:

- A. Subsurface Conditions: Refer to Section 02672, Appendix A, Geotechnical Report.

### PART 2 - PRODUCTS

#### 2.01 GENERAL:

- A. Use only acceptable materials from excavations or borrows.
- B. Provide 10 MPa concrete, screened gravel, bank-run gravel, fine aggregate, select borrow, and crushed stone.
- C. Provide Fine Aggregate conforming to ASTM C33.

#### 2.02 EQUIPMENT:

- A. The compaction equipment shall be selected by the Contractor and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:
  - 1. Manually operated vibratory plate compactors weighing no less than 90 kg with vibration frequency no less than 1600 cycles per minute.
  - 2. Vibratory steel drum or rubber tire roller weighing at least 5,450 kg.

### PART 3 - EXECUTION

#### 3.01 SITE MAINTENANCE:

- A. Roadway and Site Leveling: Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

#### 3.02 EXCAVATION:

- A. Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- B. Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- C. Excavate to widths that give suitable room for building structures or laying and jointing piping.
- D. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- E. Excavate to lines and grades indicated in an orderly and continuous program.
- F. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- G. Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- H. Exercise care to preserve material below and beyond the lines of excavations.
- I. Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- J. Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.

### 3.03 SEPARATION OF EXCAVATED MATERIALS FOR REUSE:

- A. Remove only existing pavement that is necessary for prosecution of work.
- B. Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- C. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.

### 3.04 TRENCH EXCAVATION:

- A. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and

undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.

**3.05 DEPTH OF TRENCH:**

- A. Excavate trenches to depths to permit pipe to be laid at elevations, slopes, or depths of cover indicated on drawings, and at uniform slopes between indicated elevations.

**3.06 WIDTH OF TRENCH:**

- A. Make pipe trenches as narrow as practicable and do not widen by scraping or loosening materials from the sides. Make every effort to maintain sides of trenches firm and undisturbed until backfilling has been placed and compacted.
- B. Excavate trenches with approximately vertical sides between springline of pipe and elevation 30 cm above top of pipe.

**3.07 TRENCH EXCAVATION IN FILL:**

- A. Place and compact material to top of fill or to a minimum height of 30 cm above top of pipe, whichever is less, when pipe is to be laid in embankment or other recently filled material. Take particular care to ensure maximum consolidation of material under pipe location. Excavate pipe trench as though in undisturbed material.

**3.08 EXCAVATION NEAR EXISTING STRUCTURES:**

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly.

**3.09 REMOVAL OF SUBSURFACE OBSTRUCTIONS:**

- A. Remove indicated subsurface structures and related obstructions to extent shown.
- B. Promptly notify the Engineer when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

**3.10 UNAUTHORIZED EXCAVATION:**

- A. When the bottom of any excavation for structures is taken out beyond limits indicated or specified, backfill, with screened gravel and crushed stone wrapped with non-woven geotextile fabric or with 10 MPa concrete.

**3.11 REUSE AND DISPOSAL OF SURPLUS EXCAVATED MATERIALS:**

- A. Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed.
- B. Surplus excavated material shall not be used in locations where structural backfill is required.

### 3.12 SUBGRADE PREPARATION AND PROTECTION:

- A. Remove loam and topsoil, loose vegetable matter, stumps and large roots from areas upon which embankments will be built or material will be placed for grading. Shape subgrade as indicated on drawings, and prepare by forking, furrowing, or plowing so that the first layer of new material placed thereon will be well bonded to it.
- B. As directed by the Engineer, overexcavate unacceptable materials below the foundation subgrade. Backfill the overexcavation with compacted screened gravel or crushed stone wrapped with nonwoven geotextile fabric. In no case shall the screened gravel be placed directly on the exposed subgrade prior to placing the geotextile fabric.
- C. Proof roll the foundation subgrade prior to backfilling and filling operations or placing foundation concrete.
- D. Proof roll the pipe trench foundation subgrade prior to backfilling and filling operations or placing a soil-supported pipeline.

### 3.13 CARE AND RESTORATION OF PROPERTY:

- A. Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- C. Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- D. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.

- E. Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

### 3.14 BACKFILLING - GENERAL:

- A. Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- B. Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- C. Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- D. Do not use puddling, ponding or flooding as a means of compaction.

### 3.15 MATERIAL PLACEMENT AND COMPACTION REQUIREMENTS:

- A. Select Borrow, and Fine Aggregate:
  - 1. Dump and spread in layers not to exceed 20 cm uncompacted thickness.
  - 2. Compact, fill and backfill under structure and bedding for pipes (from below pipe to spring line) as indicated but to not less than 95 percent. Compact to not less than 90 percent in other areas unless otherwise indicated.
- B. Screened Gravel and Crushed Stone:
  - 1. Dump and spread in layers not to exceed 20 cm uncompacted thickness.
  - 2. Compact using self propelled vibratory steel drum or rubber tire rollers with a minimum of 4 passes in directions perpendicular to one another in open areas. In small areas, use manually operated vibratory plate compactors with a minimum of 4 passes.
- C. Bank-run Gravel and Acceptable materials for use as non-structural fill:
  - 1. Dump and spread in layers not to exceed 30 cm uncompacted thickness.
  - 2. Compact to not less than 90 percent unless otherwise indicated.
- D. Backfilling and filling operation shall be suspended in areas where tests are being made until tests are completed and the testing laboratory has advised the Engineer that adequate densities are obtained.

### 3.16 STRUCTURAL FILL AND BACKFILL UNDER STRUCTURES:

- A. Compact fill and backfill under structures and pavements with screened gravel, crushed stone, select borrow, or fine aggregate as specified and indicated.
- B. Improvement of foundation soil shall be compliant with the requirements of Clause 13 of CCM 3.02.04-90.

### 3.17 NON-STRUCTURAL BACKFILL AROUND STRUCTURES:

- A. Use acceptable materials for non-structural backfill around structures and compacted as specified and indicated.
- B. Conduct hydraulic testing as soon as practicable after structures are constructed and other necessary work has been done. Start backfilling promptly after completion of tests.
- C. Deposit material evenly around structure to avoid unequal soil pressure.
- D. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.

### 3.18 BACKFILLING PIPE TRENCHES:

#### A. General:

- 1. Begin backfilling and proceed until completed after: the pipes and conduits have been laid, joints have acquired maximum degree of hardness, pipelines and conduits have successfully passed tests and inspections as required in the Specifications, and concrete or masonry structures within the trench have reached their design strength to support all loads.
- 2. Backfill and compact indicated material under, around, and above pipes, conduits, and other structures to the indicated or specified compaction density requirement. Utilize compaction devices which will not damage the pipe, conduit, or structure within the trench.
- 3. Do not drop backfill material into trench from a height of more than 150 cm, or in a manner which will damage the pipe, conduit, or other structure within trench.

#### B. Pipe Trenches:

##### 1. Materials:

- a. From below pipe to 30 cm above top of pipe: Use screened gravel, or crushed stone, unless otherwise indicated.
- b. 30 cm above top of pipe to finished grade or to pavement subbase: Use bank-run gravel or acceptable materials, unless otherwise indicated. Frost susceptible materials with more than 5% fines are prohibited



under the pavement.

2. Compacting Around Pipes: Compact material around circumference of pipe and the area between the trench wall and the pipe by hand tamping in 15 cm layers.
3. Compacting Above Pipe: Compact material by hand tamping. If trench width is wide enough to accommodate power tools and the compacted material over the pipe will support the load of the power tools without damage to the pipe, use rollers or other powered compaction equipment able to more readily achieve compaction requirements.

### 3.19 MATERIAL FOR FILLING AND EMBANKMENTS:

- A. Use acceptable materials for filling and building embankments unless otherwise indicated.

### 3.20 PLACING AND COMPACTING EMBANKMENT MATERIAL:

- A. Compact fill material as specified and indicated.
- B. Perform fill operation in an orderly and systematic manner using equipment in proper sequence to meet the specified compaction requirements.
- C. Place fill on surfaces which are free of unacceptable materials.
- D. Begin filling in lowest section of work area. Grade surface of fill approximately horizontal but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
- E. Conduct filling so that no obstruction to drainage from other sections of fill area is created at any time.
- F. Install temporary dewatering sumps in low areas during filling operation where excessive amounts of rain runoff collect.
- G. Reduce moisture content of fill material, if necessary, in source area by working it over under warm and dry atmospheric conditions. A large disc harrow with two to three-foot diameter disks may be required for working soil in a drying operation.
- H. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows which would prevent proper and uniform compaction. Do not permit hauling equipment to follow a single track on the same layer but direct equipment to spread out to prevent overcompaction in localized areas. Take care in obtaining thorough compaction at edges of fill.
- I. Slightly slope surface of fill to ensure drainage during periods of wet weather. Do not place fill while rain is falling or after a rain-storm until the Engineer considers conditions satisfactory. During such periods and upon suspension of filling operations for any period in excess of 12 hours, roll smooth the surface of fill using a smooth wheel static roller to prevent excessive absorption of rainfall and surface moisture.

Prior to resuming compaction operations, remove muddy material off surface to expose firm, compacted material, as determined by the Engineer.

- J. When fill is placed against an earlier fill or against in-situ material under and around structures, including around piping beneath structures or embankments, slope junction between two sections of fill, 1 vertical to 1.5 horizontal. Bench edge of existing fill 60 cm to form a serrated edge of compact stable material against which to place the new fill. Ensure that rolling extends over junction between fills.
- K. When fill is placed directly upon another older fill, clean surface thoroughly of debris and remove any loose material. Then proof roll the entire old surface.
- L. After spreading each loose lift to the required thickness and adjusting its moisture content as necessary, roll with sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means of sufficient overlap that will insure complete coverage and uniform compaction of an entire lift. Do not make additional passes until previous pass has been completed.
- M. In case material of any fill sinks and weaves under roller or under hauling units and other equipment, required degree of compaction is not being obtained. Reduce the moisture content. If such sinking and weaving produces surface cracks, suspend operations on that part of the embankment until it becomes sufficiently stabilized. Ideal condition in fill is that attained when the entire fill below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as roller passes. Spread out rolling operations over the maximum practicable area to minimize condition of sinking and weaving.
- N. If because of defective workmanship, compaction obtained over any area is less than that required, remedy condition at no cost to Owner. If additional rolling or other means fail to produce satisfactory results, remove material in that area down to a level of satisfactory density. Perform removal, replacement, and rerolling without additional compensation.

### 3.21 COMPACTION CONTROL OF BACKFILL, FILL, AND EMBANKMENT:

- A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified or if not specified, at a level slightly lower than optimum. Comply with the requirements of Clause 4 and Table 7 of CCM 3.02.01-90.
- B. The soil testing laboratory shall provide inspection during filling or backfilling operations to ensure compaction of screened gravel or crushed stone and record compaction equipment in use.
- C. Moisture control may be required either at the stockpile area, pits, or on embankment or backfill. Increase moisture content when material is too dry by sprinkling or other means of wetting uniformly. Reduce moisture content when material is too wet by using ditches, pumps, drainage wells, or other devices and by exposing the greatest possible area to sun and air in conjunction with disc harrowing, plowing, spreading of material or any other effective methods.

### 3.22 ALLOWANCE FOR SHRINKAGE:

- A. Build embankments or backfill to a height above finished grade which will, in the opinion of the Engineer, allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.
- B. Supply specified materials and build up low places as directed, without additional cost if embankment or backfilling settles below the indicated level for proposed finished surface at any time before final acceptance of the work.

### 3.23 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01700.

END OF SECTION

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Note that the primary standards referenced herein are ASTM. Subject to acceptance by the Engineer, alternative standards may be used in lieu of ASTM provided the proposed alternative is an internationally recognized standard (e.g., British Standard (BS) or local MNS Standard) that are considered similarly effective in terms of material quality and performance of the constructed product.

## SECTION 02210 (CP-2, CP-3)

### EARTH EXCAVATION, BACKFILL, FILL AND GRADING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. Perform the following earth excavation, backfill, fill and grading as indicated or specified:
  - 1. Make excavations to accommodate piping, conduits, foundations and other structures.
  - 2. Provide materials for backfilling excavations and constructing embankments and fills as indicated and specified.
  - 3. Construct embankments of compacted materials.
  - 4. Grade surfaces to meet finished grades indicated.
  - 5. Immediately notify the Engineer if suspected hazardous materials are encountered and cease operations in that part of work.
  - 6. Remove boulders within the excavation limits.

##### 1.02 RELATED WORK:

- A. Section 01568: Erosion Control, Sedimentation and Containment of Construction Materials
- B. Section 02100: Site Preparation
- C. Section 02140: Dewatering
- D. Section 02160: Excavation Support Systems
- E. Section 02223: Screened Gravel
- F. Section 02224: Bank-run Gravel
- G. Section 02225: Select Borrow

- H. Section 02273: Geotextile Fabric
- I. Section 02435: Crushed Stone
- J. Section 03300: Cast-in-Place Concrete

### 1.03 REFERENCES:

#### A. American Society for Testing and Materials (ASTM) Publications:

1. C33: Specification for Concrete Aggregates.
2. C136: Sieve Analysis of Fine and Coarse Aggregates.
3. D421: Practice for Dry Preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants.
4. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75  $\mu\text{m}$ ) Sieve.
5. D1556: Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
6. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (600 kN-m/m<sup>3</sup>).
7. D2167: Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
8. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
9. D4718: Practice for Correction of Unit Weight and Water Content for Soils Containing Oversized Particles.
10. D4944: Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Pressure Tester Method.
11. D4959: Test Method for Field Determination of Water (Moisture) Content of Soil by Direct Heating Method.
12. D5080: Test Method for Rapid Determination of Percent Compaction.
13. D6913: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
14. D6938: Standard Test method for In-Place Density and Water Content of Soil and Soil-Aggregate by nuclear Methods (Shallow Depth)



15. D7928: Standard Test Methods for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis
16. CCM 3.02.01-90: Earthwork, Footing and Foundation Work for Construction.

#### 1.04 DEFINITIONS:

- A. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- B. Proof Roll: Compaction with a minimum of 4 passes of a vibratory steel drum or rubber tire roller. Vibratory plate compactors shall be used in small areas where vibratory steel drum or rubber tire roller cannot be used. Should comply with the trial test requirement per Annex 4 of CCM 3.02.01-90.
- C. Acceptable Material: Material which does not contain organic silt or organic clay, peat, vegetation, wood or roots, stones or rock fragments over 15 cm in diameter, porous biodegradable matter, loose or soft fill, excavated pavement, construction debris, or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material.
- D. Unacceptable Materials: Materials that do not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.

#### 1.05 SUBMITTALS:

- A. Submit the following in accordance with Section 01300:
  1. Qualifications of the Contractor's Independent Testing Laboratory as specified in Paragraph 1.06.H, four (4) weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.
  2. Submit an excavation, backfilling, and filling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
    - a. Detailed sequence of work.
    - b. General description of construction methods.
    - c. Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
    - d. Details of dust control measures.

- e. Proposed locations of stockpiled excavation and/or backfill materials.
  - f. Proposed surplus excavated material off-site disposal areas and required permits.
  - g. Details of erosion and sedimentation control measures which will prevent erosion and sedimentation during the earth moving activities.
3. The following material submittals shall be submitted to the Engineer prior to backfilling and filling:
- a. Screened Gravel: As specified in Section 02223.
  - b. Bank-run Gravel: As specified in Section 02224.
  - c. Select Borrow: As specified in Section 02225.
  - d. Crushed Stone: As specified in Section 02435.
  - e. Other Acceptable Materials: Laboratory testing results of gradation and moisture-density relationship. Submittal shall include specific location of the source and the date when sample was taken.
4. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations.

#### 1.06 QUALITY ASSURANCE AND CONTROL:

- A. Comply with the requirements specified in Section 01400 and annexes 1,2 and 3 of CCM 3.02.01-90.
- B. Dewatering and Surface Runoff Control: Provide and maintain as specified in Section 02140.
- C. Excavations shall be performed in the dry, and kept free from water, snow and ice during construction. Bedding and backfill material shall not be placed in water. Water shall not be allowed to rise upon or flow over the bedding and backfill material.
- D. Excavation Support Systems: Provide and maintain as specified in Section 02160.
- E. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the local regulation requirements.
- F. Do not excavate, construct embankments, or fill until all the required submittals have been reviewed by the Engineer.
- G. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.

- H. Employ an independent testing laboratory to perform particle size and gradation analyses in accordance with ASTM D6913 and D7928, and to determine compactibility in accordance with ASTM D1557 for all the proposed backfill and fill materials, and monitoring field compaction operations. The Contractor's independent testing laboratory shall have the following qualifications:
1. Have three (3) years of experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations.
  2. Able to provide three (3) references from previous work.
- I. Field Testing and Inspections:
1. By Contractor's independent testing laboratory, acceptable to the Engineer, at Contractor's expense as specified in Paragraph 1.06.K.
  2. Location of tests mutually acceptable to testing laboratory and the Engineer or as directed by the Engineer.
  3. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional to the Owner.
  4. Contractor's testing laboratory to perform inspection at least once daily to confirm lift thickness and compaction effort for entire fill area.
- J. Methods of Field Testing:
1. In-Place Density: ASTM D1556, ASTM D2167, or ASTM D6938.
  2. In-Place Moisture Content: ASTM D6938, ASTM D4944, or ASTM D4959.
- K. Material Testing Frequency: The following testing frequencies are minimum required for all structural and non-structural fill, grading and embankment.
1. Field In-Place Density and Moisture Content - Screened gravel and crushed stone shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than one test per:
    - a. Trenches under structures foundation preparation or roadways subbase: Every 300 m per lift.
    - b. Trenches in areas without structures or roadways: Every 300 m per alternate lift.
    - c. Paved Roadways: Every 60 m per lift.
    - d. Paved Areas: 350 sq. m. per lift.

- e. Under Structure: 100 sq. m. per lift.
  - f. Around Structures: 150 sq. m. per lift.
  - g. Embankment Fills: 1,000 sq. m. per lift.
  - h. Frequency of testing is to comply with the requirements given in Table 17 of CCM 3.02.01-90.
- 2. Moisture Density - One per source, except for screened gravel and crushed stone. Repeat the moisture density test for every 3,825 cubic meters of material use, and whenever visual inspection indicates a change in material gradation as determined by the Engineer.
  - 3. Gradation Analysis - A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.
  - 4. Liquid Limit, Plastic Limit and Plasticity Index - Minimum of one test per 3,825 cubic meters of soil for use as fill material and whenever classification of material is in doubt as determined by the Engineer.
- L. Construction Tolerances:
- 1. Construct finished surfaces to plus or minus 2.5 cm of the elevations indicated.
  - 2. Grade cut and fill areas to plus or minus 6 cm of the grades indicated.
  - 3. Complete embankment edges to plus or minus 15 cm of the slope lines indicated.
  - 4. Provide the Engineer with adequate survey information to verify compliance with above tolerances.
- M. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
- N. Pipes, drains, and other utilities may exist in certain locations not indicated on the Drawings. No attempt has been made to show all services. Completeness or accuracy of information given is not guaranteed.
- O. Dig test pits considered as incidental to the normal excavation as indicated and specified in this Section, at no additional compensation.
- P. Carefully support and protect from damage, existing pipes, poles, wires, fences, curbs, property line markers, and other structures, which the Engineer determines must be preserved in place without being temporarily or permanently relocated. Should such items be damaged, restore without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.

- Q. Whenever certain existing structures, as described below, are encountered, and the Engineer so directs, change the location, remove and later restore, or replace such structures, or assist the Owner in doing so. Such work to be paid for under applicable items of work, otherwise as Extra Work.
- R. In removing existing pipes or other structures, include for payment only those new materials which are necessary to replace those unavoidably damaged as determined by the Engineer.
- S. The preceding two paragraphs apply to pipes, wires, and other structures which meet the following: (a) are not indicated on the drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer, will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.
- T. Restore existing property or structures as promptly as practicable.
- U. If material unacceptable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, remove such material to the required width and depth as directed by the Engineer and replace it with screened gravel, select borrow, or concrete.
- V. Do not remove excavation materials from the site of the work or dispose of except as directed or permitted by the Engineer.
- W. Haul away and dispose of surplus excavated materials at locations in accordance with all Federal, State and local requirements at no additional cost to the Owner.
- X. During progress of work, conduct earth moving operations and maintain work site so as to minimize the creation and dispersion of dust. Furnish and spread calcium chloride if the Engineer decides that it is necessary for more effective dust control.
- Y. Provide suitable and safe bridges and other crossings where required for accommodation of travel, and to provide access to private property during construction, and remove said structures thereafter.

#### 1.07 SITE CONDITIONS:

- A. Subsurface Conditions: Refer to Appendix A Geotechnical Report.

### PART 2 - PRODUCTS

#### 2.01 GENERAL:

- A. Use only acceptable materials from excavations or borrows.
- B. Provide 10 MPa concrete, screened gravel, bank-run gravel, fine aggregate, select borrow, and crushed stone.

- C. Provide Fine Aggregate conforming to ASTM C33.
- D. Provide erosion/sedimentation control devices as indicated, including geotextile fabric in accordance with Section 02273.
- E. Provide geotextile fabric as indicated, meeting the requirements and conforming to Section 02273.

## 2.02 EQUIPMENT:

- A. The compaction equipment shall be selected by the Contractor and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:
  - 1. Manually operated vibratory plate compactors weighing no less than 90 kg with vibration frequency no less than 1600 cycles per minute.
  - 2. Vibratory steel drum or rubber tire roller weighing at least 5,450 kg.

## PART 3 - EXECUTION

### 3.01 SITE MAINTENANCE:

- A. Roadway and Site Leveling: Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

### 3.02 EXCAVATION:

- A. Execution of any earth excavation shall not commence until the related dewatering, excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- B. Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- C. Excavate to widths that give suitable room for building structures or laying and jointing piping.
- D. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- E. Excavate to lines and grades indicated in an orderly and continuous program.
- F. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- G. Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.



- H. Exercise care to preserve material below and beyond the lines of excavations.
- I. Place excavated material at the approved stockpile locations and in no case closer than 90 cm from edge of excavations to prevent cave-ins of bank slides.
- J. Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.
- K. Excavate for depressed foundations, where mat foundations are indicated as depressed. Sheet and shore existing ground so that adjacent sections of foundation mat will rest on undisturbed ground as indicated. Installation of sheeting shall be in accordance with Section 02160.

### 3.03 SEPARATION OF EXCAVATED MATERIALS FOR REUSE:

- A. Remove only existing pavement that is necessary for prosecution of work.
- B. Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- C. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.

### 3.04 TRENCH EXCAVATION:

- A. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.

### 3.05 DEPTH OF TRENCH:

- A. Excavate trenches to depths to permit pipe to be laid at elevations, slopes, or depths of cover indicated on drawings, and at uniform slopes between indicated elevations.

### 3.06 WIDTH OF TRENCH:

- A. Make pipe trenches as narrow as practicable and do not widen by scraping or loosening materials from the sides. Make every effort to maintain sides of trenches firm and undisturbed until backfilling has been placed and compacted.
- B. Excavate trenches with approximately vertical sides between springline of pipe and elevation 30 cm above top of pipe.

### 3.07 TRENCH EXCAVATION IN FILL:

- A. Place and compact material to top of fill or to a minimum height of 30 cm above top of pipe, whichever is less, when pipe is to be laid in embankment or other recently filled material. Take particular care to ensure maximum consolidation of material under pipe location. Excavate pipe trench as though in undisturbed material.

### 3.08 EXCAVATION NEAR EXISTING STRUCTURES:

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly.

### 3.09 REMOVAL OF SUBSURFACE OBSTRUCTIONS:

- A. Remove indicated subsurface structures and related obstructions to extent shown.
- B. Promptly notify the Engineer when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

### 3.10 UNAUTHORIZED EXCAVATION:

- A. When the bottom of any excavation for structures is taken out beyond limits indicated or specified, backfill, with screened gravel and crushed stone wrapped with non-woven geotextile fabric or with 10 MPa concrete.

### 3.11 REUSE AND DISPOSAL OF SURPLUS EXCAVATED MATERIALS:

- A. Reuse surplus acceptable excavated materials for backfill in areas where structural backfill is not required; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation. See Appendix A for soil sampling previously completed.
- B. Surplus excavated material shall not be used in locations where structural backfill is required.

### 3.12 SUBGRADE PREPARATION AND PROTECTION:

- A. Remove loam and topsoil, loose vegetable matter, stumps and large roots from areas upon which embankments will be built or material will be placed for grading. Shape subgrade as indicated on drawings, and prepare by forking, furrowing, or plowing so that the first layer of new material placed thereon will be well bonded to it.
- B. As directed by the Engineer, overexcavate unacceptable materials below the foundation subgrade. Backfill the overexcavation with compacted screened gravel or

crushed stone wrapped with nonwoven geotextile fabric. In no case shall the screened gravel be placed directly on the exposed subgrade prior to placing the geotextile fabric.

- C. Proof roll the foundation subgrade prior to backfilling and filling operations or placing foundation concrete.
- D. Proof roll the pipe trench foundation subgrade prior to backfilling and filling operations or placing a soil-supported pipeline.

### 3.13 CARE AND RESTORATION OF PROPERTY:

- A. Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- C. Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- D. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- E. Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

### 3.14 BACKFILLING - GENERAL:

- A. Do not place frozen materials in backfill or place backfill upon frozen material. Remove previously frozen material or treat before new backfill is placed.
- B. Do not place frost susceptible material with fines content more than 5% underneath pavement, structures, and other facilities.
- C. Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.

- D. Do not use puddling, ponding or flooding as a means of compaction.

### 3.15 MATERIAL PLACEMENT AND COMPACTION REQUIREMENTS:

- A. Select Borrow, and Fine Aggregate:

1. Dump and spread in layers not to exceed 20 cm uncompacted thickness.
2. Compact, fill and backfill under structure and bedding for pipes (from below pipe to spring line) as indicated but to not less than 95 percent. Compact to not less than 90 percent in other areas unless otherwise indicated.

- B. Screened Gravel and Crushed Stone:

1. Dump and spread in layers not to exceed 20 cm uncompacted thickness.
2. Compact using self propelled vibratory steel drum or rubber tire rollers with a minimum of 4 passes in directions perpendicular to one another in open areas. In small areas, use manually operated vibratory plate compactors with a minimum of 4 passes.

- C. Bank-run Gravel and Acceptable materials for use as non-structural fill:

1. Dump and spread in layers not to exceed 30 cm uncompacted thickness.
2. Compact to not less than 90 percent unless otherwise indicated.

- D. Backfilling and filling operation shall be suspended in areas where tests are being made until tests are completed and the testing laboratory has advised the Engineer that adequate densities are obtained.

### 3.16 STRUCTURAL FILL AND BACKFILL UNDER STRUCTURES:

- A. Compact fill and backfill under structures and pavements with screened gravel, crushed stone, select borrow, or fine aggregate as specified and indicated.
- B. Improvement of foundation soil shall be compliant with the requirements of Clause 13 of CCM 3.02.04-90.

### 3.17 NON-STRUCTURAL BACKFILL AROUND STRUCTURES:

- A. Use acceptable materials for non-structural backfill around structures and compacted as specified and indicated.
- B. Conduct hydraulic testing as soon as practicable after structures are constructed and other necessary work has been done. Start backfilling promptly after completion of tests.
- C. Deposit material evenly around structure to avoid unequal soil pressure.

- D. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.

### 3.18 BACKFILLING PIPE TRENCHES:

#### A. General:

1. Begin backfilling and proceed until completed after: the pipes and conduits have been laid, joints have acquired maximum degree of hardness, pipelines and conduits have successfully passed tests and inspections as required in the Specifications, and concrete or masonry structures within the trench have reached their design strength to support all loads.
2. Backfill and compact indicated material under, around, and above pipes, conduits, and other structures to the indicated or specified compaction density requirement. Utilize compaction devices which will not damage the pipe, conduit, or structure within the trench.
3. Do not drop backfill material into trench from a height of more than 150 cm, or in a manner which will damage the pipe, conduit, or other structure within trench.

#### B. Pipe Trenches:

1. Materials:
  - a. From below pipe to 30 cm above top of pipe: Use screened gravel, or crushed stone, unless otherwise indicated.
  - b. 30 cm above top of pipe to finished grade or to pavement subbase: Use bank-run gravel or acceptable materials, unless otherwise indicated. Frost susceptible materials with more than 5% fines are prohibited under the pavement.
2. Compacting Around Pipes: Compact material around circumference of pipe and the area between the trench wall and the pipe by hand tamping in 15 cm layers.
3. Compacting Above Pipe: Compact material by hand tamping. If trench width is wide enough to accommodate power tools and the compacted material over the pipe will support the load of the power tools without damage to the pipe, use rollers or other powered compaction equipment able to more readily achieve compaction requirements.

### 3.19 MATERIAL FOR FILLING AND EMBANKMENTS:

- A. Use acceptable materials for filling and building embankments unless otherwise indicated.

### 3.20 PLACING AND COMPACTING EMBANKMENT MATERIAL:

- A. Compact fill material as specified and indicated.
- B. Perform fill operation in an orderly and systematic manner using equipment in proper sequence to meet the specified compaction requirements.
- C. Place fill on surfaces which are free of unacceptable materials.
- D. Begin filling in lowest section of work area. Grade surface of fill approximately horizontal but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
- E. Conduct filling so that no obstruction to drainage from other sections of fill area is created at any time.
- F. Install temporary dewatering sumps in low areas during filling operation where excessive amounts of rain runoff collect.
- G. Reduce moisture content of fill material, if necessary, in source area by working it over under warm and dry atmospheric conditions. A large disc harrow with two to three-foot diameter disks may be required for working soil in a drying operation.
- H. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows which would prevent proper and uniform compaction. Do not permit hauling equipment to follow a single track on the same layer but direct equipment to spread out to prevent overcompaction in localized areas. Take care in obtaining thorough compaction at edges of fill.
- I. Slightly slope surface of fill to ensure drainage during periods of wet weather. Do not place fill while rain is falling or after a rain-storm until the Engineer considers conditions satisfactory. During such periods and upon suspension of filling operations for any period in excess of 12 hours, roll smooth the surface of fill using a smooth wheel static roller to prevent excessive absorption of rainfall and surface moisture. Prior to resuming compaction operations, remove muddy material off surface to expose firm, compacted material, as determined by the Engineer.
- J. When fill is placed against an earlier fill or against in-situ material under and around structures, including around piping beneath structures or embankments, slope junction between two sections of fill, 1 vertical to 1.5 horizontal. Bench edge of existing fill 60 cm to form a serrated edge of compact stable material against which to place the new fill. Ensure that rolling extends over junction between fills.
- K. When fill is placed directly upon another older fill, clean surface thoroughly of debris and remove any loose material. Then proof roll the entire old surface.
- L. After spreading each loose lift to the required thickness and adjusting its moisture content as necessary, roll with sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means of sufficient overlap that will insure complete coverage and uniform compaction of an entire lift. Do not make additional passes until previous pass has been completed.



- M. In case material of any fill sinks and weaves under roller or under hauling units and other equipment, required degree of compaction is not being obtained. Reduce the moisture content. If such sinking and weaving produces surface cracks, suspend operations on that part of the embankment until it becomes sufficiently stabilized. Ideal condition in fill is that attained when the entire fill below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as roller passes. Spread out rolling operations over the maximum practicable area to minimize condition of sinking and weaving.
- N. If because of defective workmanship, compaction obtained over any area is less than that required, remedy condition at no cost to Owner. If additional rolling or other means fail to produce satisfactory results, remove material in that area down to a level of satisfactory density. Perform removal, replacement, and rerolling without additional compensation.

### 3.21 COMPACTION CONTROL OF BACKFILL, FILL, AND EMBANKMENT:

- A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified or if not specified, at a level slightly lower than optimum. Comply with the requirements of Clause 4 and Table 7 of CCM 3.02.01-90.
- B. The soil testing laboratory shall provide inspection during filling or backfilling operations to ensure compaction of screened gravel or crushed stone and record compaction equipment in use.
- C. Moisture control may be required either at the stockpile area, pits, or on embankment or backfill. Increase moisture content when material is too dry by sprinkling or other means of wetting uniformly. Reduce moisture content when material is too wet by using ditches, pumps, drainage wells, or other devices and by exposing the greatest possible area to sun and air in conjunction with disc harrowing, plowing, spreading of material or any other effective methods.

### 3.22 ALLOWANCE FOR SHRINKAGE:

- A. Build embankments or backfill to a height above finished grade which will, in the opinion of the Engineer, allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.
- B. Supply specified materials and build up low places as directed, without additional cost if embankment or backfilling settles below the indicated level for proposed finished surface at any time before final acceptance of the work.

### 3.23 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01700.

END OF SECTION

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## SECTION 02230 (CP-1)

## SITE CLEARING

## PART 1 – GENERAL

## 1.01 DESCRIPTION:

- A. This section specifies all materials, equipment, labor and services required for all site temporary clearing work, including all items incidental thereto, as specified herein. All site clearing which may be required shall be limited to the access road and the confines of the water purification plant site, temporary access tracks, and permanent access tracks. No work outside of these areas shall be permitted unless authorized by the Owner.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 RELATED WORK:

- A. Section 01046: Control of Work
- B. Section 01110: Environmental Protection Procedures
- C. Section 01568: Erosion Control, Sedimentation & Containment of Construction Materials
- D. Section 02210: Earth Excavation, Backfill, Fill and Grading

## 1.04 REFERENCE:

- A. MNS 5415: System of Building Design Documents, Graphical Symbols and Signs of Elements of Construction Site

## PART 2 – PRODUCTS

NOT USED

## PART 3 – EXECUTION

### 3.01 CLEARING AND GRUBBING:

- A. Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
- B. Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
- C. Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
- D. Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
- E. Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
- F. The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
- G. Site clearing shall start once the Temporary Site Plan is approved by the Owner.
- H. The temporary site plan drawing shall comply with the requirements in MNS 5415.

END OF SECTION

## SECTION 02230 (CP-2, CP-3)

## SITE CLEARING

## PART 1 – GENERAL

## 1.01 DESCRIPTION:

- A. This section specifies all materials, equipment, labor and services required for all site temporary clearing work, including all items incidental thereto, as specified herein. All site clearing which may be required shall be limited to the access road and the confines of the water purification plant site as indicated. No work outside of these areas shall be permitted unless authorized by the Owner.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 RELATED WORK:

- A. Section 01046: Control of Work
- B. Section 01110: Environmental Protection Procedures
- C. Section 01568: Erosion Control, Sedimentation & Containment of Construction Materials
- D. Section 02100: Site Preparation
- E. Section 02210: Earth Excavation, Backfill, Fill and Grading
- F. Section 02480: Landscaping
- G. Section 02483: Planting Operations

## 1.04 REFERENCE:

- A. MNS 5415: System of Building Design Documents, Graphical Symbols and Signs of Elements of Construction Site

## PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 CLEARING AND GRUBBING:

- A. Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material as indicated on the drawings.
- B. Protect all areas not otherwise shown to be disturbed. Should these areas be damaged, the Contractor shall restore them to original condition or better at no additional cost to the Owner.
- C. Grubbing shall include the removal and disposal off-site of all stumps and roots to a depth not less than 460 mm below subgrade.
- D. Fill all holes from removal of stumps and roots with clean fill compacted to subgrade.
- E. Remove all debris and rubbish from each site and legally dispose of same. Burning debris will not be permitted.
- F. The Contractor shall comply with all requirements of related Sections and applicable permit conditions.
- G. Site clearing shall start once the Temporary Site Plan is approved by the Owner.
- H. The temporary site plan drawing shall comply with the requirements in MNS 5415.

END OF SECTION



Note that the primary standards referenced herein are ASTM. Subject to acceptance by the Engineer, alternative standards may be used in lieu of ASTM provided the proposed alternative is an internationally recognized standard (e.g., British Standard (BS) and the cited local MNS Standards) that are considered similarly effective in terms of material quality and performance of the constructed product.

## SECTION 02268 (CP-2, CP-3)

### EROSION CONTROL BARRIER

#### PART 1 – GENERAL

##### 1.01 SCOPE:

- A. This section covers the provision of erosion control barriers, their installation, and maintenance.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

##### 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

##### 1.03 SUBMITTALS:

- A. Manufacturer's catalog sheets on geotextile fabrics shall be submitted in accordance with the Submittal Procedures section.

#### PART 2 - PRODUCTS

##### 2.01 FABRIC:

- A. Fabric may be woven or non-woven, made from polypropylene, polyethylene, or polyamid, and shall contain sufficient UV inhibitors so that it will last for 2 years in outdoor exposure.
- B. Fabric shall have the following properties:

<u>Parameter</u>	<u>Standard Method</u>	<u>Value</u>
Grab Tensile Strength, N	ASTM D4632	445
Burst Strength, kPa	ASTM D3786	1380
Apparent Opening Size	ASTM D4751	Between 200 and 70 sieve size

**2.02 POSTS:**

- A. Posts shall be wood, at least 50 by 50 millimeters, at least 2 meters long.

**2.03 FENCING:**

- A. Woven wire fabric fencing shall be galvanized, mesh spacing of 150 millimeters, maximum 1.62-millimeter diameter wire, at least 800 millimeters tall.

**2.04 FASTENERS:**

- A. Fasteners to wood posts shall be steel, at least 40 millimeters long.

**PART 3 – EXECUTION****3.01 PREPARATION:**

- A. Provide erosion control barriers at the indicated locations and as required to prevent erosion and silt loss from the Site. Contractor shall not commence clearing, grubbing, earthwork, or other activities which may cause erosion until barriers are in place.

**3.02 INSTALLATION:**

- A. Barrier systems shall be installed in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated.
- B. Attach the woven wire fencing to the posts that are spaced a maximum of 2 meters apart and embedded a minimum of 300 millimeters. Install posts at a slight angle toward the source of the anticipated runoff.
- C. Trench in the toe of the filter fabric barrier with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow. Lay fabric along the edges of the trench. Backfill and compact.
- D. Securely fasten the fabric materials to the woven wire fencing with tie wires.
- E. Reinforced fabric barrier shall have a height of 450 millimeters.
- F. Provide the filter fabric in continuous rolls and cut to the length of the fence to minimize the use of joints. When joints are necessary, splice the fabric together only at a support post with a minimum 150 millimeters overlap and seal securely.

**3.03 MAINTENANCE:**

- A. Regularly inspect and repair or replace damaged components of the barrier. Unless otherwise directed, maintain the erosion control system until final acceptance; then remove erosion and sediment control systems promptly.

- B. Remove sediment deposits when silt reaches a depth of 150 millimeters or 1/2 the height of the barrier, whichever is less. Dispose of sediments on the Site, if a location is indicated on the Drawings, or at a site arranged by the Contractor which is not in or adjacent to a stream or floodplain.

END OF SECTION

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## SECTION 02480 (CP-2, CP-3)

## LANDSCAPING

## PART 1 - GENERAL

## 1.01 DESCRIPTION:

- A. Provide loaming, fertilizing, seeding, planting and related work as indicated and specified.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 REFERENCE STANDARD:

- A. Mongolian Standard for Agriculture.
  - 1. MNS 5918:2008 Environment. Re-vegetation of destroyed land. General technical requirements.
  - 2. MNS 5973:2009 The size of green facilities (garden) and its distance in construction planning and engineering infrastructure development.
  - 3. MNS 5994:2009 Seeds of trees and shrubs. Sowing characteristics. Specifications.
  - 4. MNS 6139:2010 Seedlings of coniferous trees. Technical requirement.
  - 5. MNS 6140:2020 Seedlings of woody and bushy species. Technical requirement.
  - 6. MNS 6141:2010 Seedlings of deciduous trees. Technical requirement.
  - 7. MNS 6253-1:2011 Preparing seeds of trees and shrubs for planting. General requirements.
  - 8. MNS 6253-2:2011 Planting seeds of trees. General requirement.
  - 9. MNS 6253-3:2011 Caring of trees and shrubs after the planting. General requirement.
  - 10. MNS 6254:2011 Growing seedlings of trees and shrubs. General requirement.
  - 11. MNS 6255:2011 Seedling of shrubs. General requirement.

12. MNS 6258-1:2011 Planting and pitting seedlings hole. General requirement.
13. MNS 6260:2011: Growing seeds, cultivation and nursing in lawn area.
14. MNS 6263:2011 Checking garden objects and accept for use it. General requirement

#### B. LANDSCAPE REFERENCE

1. CCM 81-59-05 Landscaping and other works

#### C. BROAD LEAF TREES

1. MNS 4729:2010 Semi-processed broadleaf timber. Technical requirement
2. MNS 6141:2010 Seedlings of deciduous trees. Technical requirement

#### D. FLOWER BED

1. MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area
2. MNS 6259:2011 Method planting of annual plants

#### E. DECORATIVE WOODY PLANTS

1. According to landscape detailed design contractor need to plant *Populus sibirica*, *Padus asiatica Kom*, *Syringa*, *Caragana arborescens Lam*.

#### F. WOODY PLANTS IN BOXES

1. Woody plants in boxes need to install according to detailed design. Light resistance of varnish acrylic for woody plants in boxes complies with GOST R 52020-2003.

#### G. THE REST AREA COMPONENTS

1. Bench must meet the UCS 1404C:2020 city standard.
2. Trash bin must meet the UCS 1403C:2020 city standard. Bench and trash bin need to install according to detailed design. Light resistance of varnish acrylic for bench and wood canopy complies with GOST R 52020-2003.
3. Paved walkway must meet the UCS 0901B:2020 city standard and MNS EN 1342:2012.

#### 1.04 SUBMITTALS:

##### A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:

1. In Accordance with MNS 6138:2010 provide statement confirming that all seedlings and planting materials are sourced in the project vicinity with similar soil and climatic conditions.



2. Prior to placement of any mulch, deposit, at a location on site suitable to Engineer, 1/2 m<sup>3</sup> sample of mulch for examination. After mulch sample is reviewed by the Engineer, provide mulch conforming to accepted sample.
3. Submit with seed, certificates concerning seed mixture, purity, germinating value, and crop year identification.
4. Submit test samples of loam to a certified soils consultant to determine fertilizer and lime requirements and return two copies of results for implementation.
5. Submit list of plant material to be used and source.
6. Prior to end of maintenance period, furnish two copies of written maintenance, instructions for maintenance and care of installed plants and lawn areas.

#### 1.05 QUALITY ASSURANCE:

A. Conform with minimum requirements of MNS 6140:2020.

B. Ability to Deliver:

1. Investigate sources of supply and make assurances that plants will be supplied as indicated in Schedule of Plant Material in sizes, variety and quality noted and specified before submitting bid.
2. Failure to take this precaution will not relieve responsibility for furnishing and installing plant material in accordance with Contract requirements and without additional expense to OWNER.

C. Inspection:

1. Upon delivery and before planting, Engineer will inspect plants.
2. Inspection and approval by Engineer of plants is for quality, size and variety only and in no way impairs the right of rejection for failure to meet other requirements during progress of work.

D. General:

1. Provide only nursery grown plants having been transplanted at least once and growing in a nursery for at least two years.
2. Allow Engineer to determine fitness of any plant.
3. Provide container grown stock in containers long enough for root system to develop sufficiently to hold soil together firm and whole when removed from container. Use no plants loose in the container.

4. Check plant material prior to commencing of planting operations. Plant no material prior to inspection by Engineer. Notify Engineer at least 48 hours in advance of all planned planting operations and identify specific material and its location.
5. Furnish suitable quantities of water, hose and appurtenances.
6. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.
7. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.
8. Repair or replace seeded areas, plants, shrubs, and trees which, in judgment of Engineer, have not survived and grown in a satisfactory manner, for a period of one year after acceptance.
9. Provide as specified seedings or plantings replacements of the same type and size as specified.
10. Dry loam test samples to constant weight at temperature of 110 deg. C, plus or minus 13 degrees.

#### 1.06 DELIVERY, STORAGE AND HANDLING:

A. Provide in accordance with Section 01610.

B. Preparation for Delivery:

1. Balled and Burlapped (B & B) Plants:

- a. Dig and prepare for shipment in manner that will not damage roots, branches, shape, and future development of plant.
- b. B & B Plants: Originate from soil which will hold a good ball and be wrapped with burlap or similar approved material, bound with twine or cord in such manner as to hold balls firm and intact.
- c. Ball Sizes: Not less than standard established by the American Association of Nurserymen for B & B stock.

C. Delivery:

1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, and conformance to state law.
2. Delivery plants with legible identification labels:

- a. Label trees, evergreens, shrubs, and ground cover with waterproof labels which will remain legible for at least 60-days.
  - b. Label with correct plant name and size as indicated in Plant List.
3. Protect plants during delivery to prevent damage to roots or desiccation of leaves.
4. Notify Engineer of delivery schedule in advance so plant material may be inspected at jobsite.

D. Storage:

1. Store plants in ground or other acceptable media if not to be planted within 4-hrs.
2. Protect roots of plant material from drying or other possible injury.
3. Water plants as necessary until planted.

E. Handling:

1. Do not drop plants.
2. Do not pick up container or B & B plants by stem or trunks.

1.07 JOB CONDITIONS:

- A. It is the intent of this specification that existing trees within grading and seeding limits, not disturbed by building operations, be saved and protected, except where specified to be removed. Clear trees required to be removed only after approval by Engineer. Engineer directs variations required in grading on the job.

B. Planting Seasons:

1. Recommended Spring Planting Season: From time soil can be satisfactorily worked until following dates at end of planting season:
  - a. General: Due to geography, climatic conditions of Mongolia planting season of all species of evergreens, trees-coniferous and deciduous species, shrubs, bushes are required to be planted in spring or autumn season as noted below:
    - (1) Spring planting: 20 April~25 May
    - (2) Autumn planting: 25 September~01 November

Specific dates for the various types of plants are noted below.

- b. Evergreens – April 20 to May 25. MNS 6139:2010 Seedlings of coniferous trees. Technical requirement and MNS 6774:2019

- c. Trees and Shrubs – MNS: 6253-2:2011 Planting seeds of trees. General requirement.
    - d. Lawns – May 11 to June 30. MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area.
  - 2. Recommended Fall Planting Season: Commence and terminate at time listed below:
    - a. Evergreens – September 25 to November 01. MNS 6139:2010 Seedlings of coniferous trees. Technical requirement.
    - b. Trees and Shrubs – MNS 6253-2:2011 Planting seeds of trees. General requirements.
    - c. Lawns – May 20 – June 30 MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area.
  - C. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
  - D. Protection:
    - 1. Protect seeded and planted areas against damage by trespass and other causes.
    - 2. Protect work until accepted.
    - 3. Replace, repair, restake, or replant as directed by Engineer, and at own expense, seeding or planting which is damaged.
    - 4. If planting is done after lawn preparation, protect lawn areas, repair damage resulting from planting operations.
  - E. Wherever landscape work must be executed in conjunction with construction of other work, arrange a schedule of procedure that will permit execution of landscape work as specified.
- 1.08 WARRANTY:
- A. Provide in accordance with Section 01740.
  - B. Guarantee new plant material through three full growing seasons after plants are installed.
    - 1. Guarantee plants replaced under this for three full growing seasons from date of replacement.
    - 2. Repair damage to plants or lawns during plant replacement.

- C. Guarantee lawn areas for duration of three full years after seeding to be alive and in satisfactory growth at end of guarantee period.
  - 1. For purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than 930 cm<sup>2</sup> will be allowed up to a maximum of 3% of lawn area.

## PART 2 - PRODUCTS

### 2.01 PLANTS:

- A. Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.
- B. Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.
  - 1. Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.

### 2.02 EVERGREENS

- A. In Mongolia distributes four species (*Abies sibirica*-Жодоо, *Pinus sibirica*-Хуш, *Picea obovata*-Гацуур, *Pinus sylvestris*-Нарс) and *Larix sibirica*-Шинэс which is another conifer species, among them three species (*Pinus sylvestris*, *Larix sibirica* and *Picea obovata*) are commonly used and transplanted either by nursery stock or transplanted from natural stands for the purpose of landscape material production. The requirements on the size, quality assessment category, digging, storage, packing, and transporting are stated in MSN 6139:2010 (Seedlings of coniferous species) and MNS 6774:2019 (Transplanting and care of large trees seedlings).

### 2.03 BONE MEAL:

- A. Commercial raw bone meal finely ground and containing a minimum of 1 percent nitrogen and 18 percent phosphoric acid.

### 2.04 STAKES:

- A. Wood stakes, minimum of 50-mm by 50-mm square and 2.5 meters in length, of uniform size, straight, reasonably free from knots, treated with wood preservative and painted green.

### 2.05 WIRE:

- A. Two strands No. 14-gage galvanized soft ferrous wire, twisted, for tree guying.

**2.06 HOSE COLLAR:**

- A. Good quality reinforced rubber hose of minimum 13-mm inside diameter and green in color, for protecting tree bark from supporting wires.

**2.07 TREE WRAP:**

- A. Quality, heavy, waterproof crepe paper manufactured for this purpose. Width of material not less than 15 cm and wrapped from bottom with minimum 50 mm overlap.

**2.08 ANTIDESICCANT:**

- A. Acceptable antidesiccant emulsion which provides a film over plant surfaces permeable enough to permit transpiration.
- B. Applied to evergreen trees, shrubs and all deciduous plant material. Application made prior to transportation from nursery if deciduous trees are leafed out at time of digging. The rate and method of application shall be in accordance with the manufacturer's recommendations.

**2.09 MULCH:**

- A. Shredded pine bark free of wood chips, stones, branches or other deleterious material. Bark shredded in strips not larger than 8 cm in any dimension and aged for period of not less than six months after removal from original logs.

**2.10 LOAM:**

- A. Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in equal proportions. Free of stumps, roots, heavy or stiff clay, stones larger than 2.5 cm in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.
- B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

**2.11 LIME, FERTILIZER AND SEED:**

- A. Ground agricultural limestone containing not less than 85 percent of total carbonates.
- B. Commercial type, uniform in composition, free flowing, conforming to state and federal laws, and at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight: Nitrogen 10 percent, Phosphorus 10 percent, Potash 10 percent.
- C. Turf grass seed, clean, high in germinating value and latest year's crop mixture in accordance with reference standard.



- D. Weeds shall not exceed 0.25 percent.

## 2.12 PEAT MOSS:

- A. Shredded, loose, substantially free of mineral and waste matters.
- B. Minimum organic matter by weight on a dry basis: 80 percent.

## PART 3 - EXECUTION

### 3.01 PLANTING PITS:

- A. Excavate with vertical sides and in accordance with following requirements:
  - 1. Excavate tree pits to minimum of 60 cm greater in diameter than root ball of tree and sufficiently deep to allow for 30 cm thick layer of planting soil mixture below root ball.
  - 2. Plant shrubs in pits 30 cm greater in width than diameter of root ball or container and minimum of 45 cm deep below finished grade, or as necessary to properly set plant at finished grade.
- B. Adjust depth of planting beds and pits to provide minimum of 20 cm of planting soil mixtures under roots of all plants.
- C. Set plants in center of pits, plumb and straight and at level that top of root ball is 2.5 cm lower than surrounding finished grade after settlement.
- D. Compact topsoil mixture thoroughly around base of root ball to fill all voids, when plant material is set. Cut all burlap and lacing and remove from top 1/3 of root ball. Do not pull burlap from under any root ball. Backfill tree and shrub pits halfway with planting soil mixture and thoroughly puddle before backfilling tree or shrub pit. Water tree or shrub, again, when each backfill operation is complete.

### 3.02 PLANTING SOIL MIXTURE:

- A. Thoroughly mix all loam used in backfilling planting pits, with peat moss at rate of 2 parts loam to 1 part peat moss, to obtain required planting soil mixture.

### 3.03 PLANTING:

- A. Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 75mm (3 inches) of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.

### 3.04 SECURING AND PROTECTING:

- A. Install tree guying and staking as indicated in details.
- B. Install hose collars for protecting tree bark.

### 3.05 PRUNING:

- A. Prune each tree and shrub in accordance with MNS 6772:2019 to preserve natural form and character of plant.
- B. Remove all dead wood, suckers and broken or badly bruised branches. In addition, remove 1/4 to 1/3 of remaining wood. Do all pruning with clean, sharp tools by workmen thoroughly familiar with this type of work. Paint cuts in excess of 25mm (1 inch) in diameter with acceptable tree paint. Cover all exposed cambium, as well as other exposed living tissue, with paint. Do not remove leaders.
- C. Apply antidesiccant to all evergreen trees and shrubs and to all deciduous plant materials which are leafed out at time of planting. Follow manufacturer's recommendations regarding rate and method of application.

### 3.06 BARK MULCH SURFACES:

- A. Mulch, with shredded pine bark, all tree pits, shrub pits and beds, and all areas planted with ground cover, immediately after planting operations are completed.
  - 1. For tree and shrub pits and beds, provide a minimum 8 cm of mulch.
  - 2. For ground cover beds, provide a minimum 5 cm of mulch.
- B. Limit mulching for trees and individual shrubs to pit area inside of saucer and for shrub, tree and ground cover beds and panels planted with multiple trees. Define limits of beds in turf areas or where no building wall or curb exists by installed metal edging as indicated.

### 3.07 PLANTING PREPARATION FOR SEEDED AREAS:

- A. Spread loam or locally available sand/manure mixture commercially available in Mongolia for such purpose on areas to be seeded, to required 15 cm depth, fine grade and compact.

### 3.08 LIME, FERTILIZER AND SEEDING:

- A. Apply lime by mechanical means at rate of 22.5 kg per 90 m<sup>2</sup>
- B. Apply commercial grade fertilizer at rate consistent with suppliers' recommendations for specific planting.
- C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without

additional compensation. Sow seed at rate of 2 kg per 90 m<sup>2</sup> on calm day, by mechanical means. Do not "Hydro-Seed" unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 6 mm and compact by means of an acceptable lawn roller weighing 45 to 70 kg per linear 0.3 m of width.

- D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray and continue throughout maintenance and protection period.
- E. Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 80 pounds per acre. Rake seed lightly, after sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 45 to 70 kg per linear 0.3 m of width.

### 3.09 CLEAN-UP:

- A. Remove soil or similar material which has been brought onto paved areas, keeping these areas clean.
- B. Upon completion of planting, remove excess soil, stones and debris which has not previously been cleaned up and legally dispose of off-site.
- C. Prepare lawns and planting areas for final inspection.
- D. Protect slopes and embankments against erosion until work is accepted. Repair eroded portions of seeded or sodded areas by refilling, resodding, remulching and reseeding as required by condition and to satisfaction of Engineer. Protection may be by installation of sod strips or other methods.

### 3.10 MAINTENANCE - SEEDED AREAS AND PLANTING:

- A. Maintain lawn areas and other seed areas at maximum height of 6.5 cm by mowing at least three times. Weed thoroughly once and maintain until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.
- B. Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
- C. Reset settled plants to proper grade and position and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period.

END OF SECTION

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## SECTION 02483 (CP-2, CP-3)

## PLANTING OPERATIONS

## PART 1 - GENERAL

## 1.01 SCOPE

- A. The work of this section includes furnishing all labor, equipment, tools, materials and accessories necessary for the complete planting and maintenance of trees, shrubs and ground cover as may be indicated on the drawings, and as specified herein.
- B. Attention is directed to all sections within BIDDING REQUIREMENTS; all sections within SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the Work described in this section shall be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 SUBMITTALS

- A. Shop drawings and brochures shall be submitted for all items to be furnished in accordance with provisions of SECTION 01300, SUBMITTALS.
- B. Submittals shall include shop drawings including at least the following:
  - 1. Information about the Landscape Contractor or Arborist.
  - 2. Complete list of all materials to be provided showing the details identified herein.

## 1.04 PRODUCT HANDLING

- A. All materials shall be shipped, stored, handled and installed according to the Mongolia Standard for Agriculture written recommendations.
  - 1. MNS 5994:2009 Seeds of trees and shrubs. Sowing characteristics. Specifications.
  - 2. MNS 6139:2010 Seedlings of coniferous trees. Technical requirement.
  - 3. MNS 6140:2010 Seedlings of woody and bushy species. Technical requirement.
  - 4. MNS 6141:2010 Seedlings of deciduous trees. Technical requirement.
  - 5. MNS 6255:2011 Seedlings of shrubs. General requirement.
  - 6. MNS 6256:2011. Seedlings of bushy species. General requirement
  - 7. MNS 6774:2019. Transplanting and care of large trees seedlings. Technical requirement

## 8. MNS 6257:2011. Poplar seedlings. General requirement

- B. The Contractor shall maintain all plant material and associated work until final acceptance by the Engineer. Maintenance shall include all pruning, spraying, watering, cultivation and weeding of all planted areas, and the repairing or replacement of all staking, wrapping, mulching and edging materials and any other operations necessary until final acceptance.
- C. Water will be furnished by the Contractor. The Contractor shall furnish all necessary hoses and such other accessories as may be required.

## 1.05 DESIGN CRITERIA

- A. Plant material shall be installed by a competent Landscape Contractor or Arborist. Such company shall be certified, or such company must have BA-8.1 special license to perform landscape work issued by the Mongolian National Construction Association (MNCA). The Landscape Contractor or Arborist shall provide references of similar installations. All planting materials shall comply with the Mongolian related standard and all materials shall be adapted to the Mongolian climate.
- B. All plant material shall be inspected and approved by the Engineer prior to planting. Any plant material which does not meet the criteria specified shall be replaced with approved plants at the Contractor's expense.
- C. All plants shall meet the requirements specified on the planting plan.
- D. All plant material shall be nursery grown and shall be shapely, well-grown, healthy, sound, and free of disease, insect pests, eggs or larvae, and shall have a well developed root system.
- E. All trees and shrubs shall be freshly dug; no heeled-in plants or plants from cold storage will be accepted. All plants shall be hardy under climatic conditions similar to those in the locality of the project.
- F. All plants shall be handled so that roots will be adequately protected at all times from drying out and from other injury. All plants shall be covered and braced during transportation.
- G. Each tree or shrub shall be properly identified by name on legible, weatherproof labels securely attached thereto. Balled and burlapped plants shall have firm, natural balls of soil, the diameter and depth of which shall be sufficient to include the roots. The earth ball shall be adequately wrapped and secured with burlap. Container grown shrubs may be substituted for balled and burlapped shrubs.
- H. Container grown plants shall have sufficient roots to hold planting mix in tact after removal from containers without being root bound.
- I. When plants of kinds and sizes specified are not available within a reasonable distance, substitutions may be made upon written approval of the Engineer.
- J. Where a size range is given, at least 40 percent of those plants shall be at or above the average for that size range. Exceptions are as follows: Plants larger than specified in the plant list may be used if approved by the Owner, but use of such plants shall not increase the cost to the Owner.



- K. Prior to planting, all planting pits will be inspected by the Engineer. Planting pits which do not meet the minimum requirements of the details indicated, shall be reshaped as necessary for approval by the Engineer.

## PART 2 - PRODUCTS

### 2.01 MATERIALS FOR GUYING, STAKING AND WRAPPING

- A. Stakes - Stakes for supporting trees shall be of the sound wood of uniform size, reasonably free of knots and capable of standing in the ground at least two years. Stakes shall be 5cm square (2 inches square) and shall not be less than 200 mm (8 ft) in length.
- B. Wire - Wire for tree bracing and guywire shall be pliable No. 12 gauge galvanized soft steel wire.
- C. Hose - Cinch-tie or approved equal hose, if used, shall be two-ply fiber bearing garden hose, not less than 2.5 cm (1 inch) inside diameter.
- D. Webbing - Web straps shall be 75mm (three inches) wide and shall be provided with grommets. Hose shall not be allowed.
- E. Wrapping Material - Wrapping material shall be first quality, heavy waterproof crepe paper manufactured for this purpose.

### 2.02 PLANTING SOIL FOR PLANTING PITS AND PLANTING BEDS

- A. Topsoil shall meet the specifications and shall be analyzed as described in SECTION 02485, LOAMING AND SEEDING.
- B. Prepared planting mixture shall conform to standard planting practices and the following minimum requirements. Any deviations will be subject to the Engineer's approval.
  - 1. Prepared planting mix shall be 1/3 peat and 2/3 topsoil plus fertilizer/additives as required by the Engineer based on recommendations from testing laboratory reports.
  - 2. Ground cover and shrub planting beds shall have 25mm (1-inch) layer of peat plus fertilizer/additives as required spread evenly over beds. Peat/additives shall then be cultivated into the top six inches of soil.
- C. Peat shall be a commercial grade peat meeting the approval of the Engineer.
- D. Fertilizer shall be furnished in manufacturer's standard containers clearly marked with the guaranteed chemical analysis of the product and shall be of the type and formulation specified by the Engineer. The fertilizer shall conform to local and federal regulations.
- E. Limestone shall be standard agricultural ground limestone and shall be delivered in the manufacturer's standard containers with a guaranteed analysis appearing on each container.
- F. Mulch shall be chip or chunk bark. Bark shall be fresh and undecayed, clean and free from weeds, leaves, moss, sticks and any other debris, and be of such a texture to resist washing or blowing. No long strips, decayed material nor sawdust will be permitted.

- G. Wetting agent shall be non-ionic surfactant consisting of a 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ether chemical type, preferably in a granular form for spreader application.
- H. Anti-Transpirant shall be delivered in manufacturer's containers, unopened, with manufacturer's labels attached.

## PART 3 - EXECUTION

### 3.01 SEASONS FOR PLANTING

- A. Seasons for planting shall be as recommended to the Contractor by the nursery supplying the plant materials, relating to site conditions, plant species, and region where planting is to be done.
- B. Planting shall be prohibited in frozen or muddy ground.
- C. Approximate planting dates shall be furnished to the Engineer for approval. Material planted out-of-season shall be given extra care and attention by the Contractor. Any out-of-season planting shall be entirely at the Contractor's risk.

### 3.02 PLANTING OPERATIONS

- A. Locations for planting beds, trees and shrubs shall be staked out by the Contractor as shown on the drawings and approved by the Engineer.
- B. Plant pits shall be excavated with vertical sides in accordance with the details on the drawings. Plant pits shall not be backfilled with prepared topsoil mixture until they have been approved by the Engineer. If pits are prepared and backfilled with topsoil to grade prior to planting, their location shall be marked and recorded on the plans so that when planting proceeds, they can readily be located.
- C. Prepared topsoil mixture for backfill in all planting areas shall have all fertilizer/additives, as specified herein, thoroughly incorporated before backfilling.
- D. Plants shall be set in center of pits plumb and straight and at such a level that after settlement, the crown of the plant will be at the surrounding finished grade.
- E. Backfilling and Watering
  - 1. When balled and burlapped trees are set, topsoil shall be compacted around bases of balls to fill all voids. All burlap, ropes or wires shall be removed from the tops of balls.
  - 2. Planting pit shall be backfilled to its depth. Backfill shall be compacted and pit then filled with water.
  - 3. After two waterings have been completely absorbed, the top half of the pit shall be backfilled and compacted.
  - 4. 0.8kg (1.75 lbs) of granular wetting agent/ 9m<sup>2</sup> (100 square foot) shall be applied to newly planted area. Wetting agent shall be raked lightly into top inch of soil and then soil raked smooth.

5. A shallow saucer larger than pit shall be formed with a 10 cm (4-inch) ridge of soil to facilitate and contain watering.
  6. Immediately after planting, the plant shall be thoroughly watered by completely filling the saucer with water a minimum of two times.
  7. Ground cover beds shall be watered to a minimum depth of 10cm (4 in) immediately after planting (after application of wetting agent).
- F. Tree guying or staking shall be in accordance with the plan detail. Care shall be taken that stakes do not pierce rootballs.

### 3.03 OBSTRUCTIONS BELOW GROUND

- A. In the event that rock, underground construction work or obstructions are encountered in any plant pit excavation work to be done under this contract, alternative locations may be selected by the Engineer.
- B. Where locations cannot be changed, the obstruction shall be removed to a depth of not more than 90cm (3 ft) below grade and no less than 15cm (6 in) below bottom of ball or roots when plant is properly set at the required grade.
- C. The Contractor shall be paid for the removal of such rock or underground obstructions encountered at the Contract rate per cubic yard, under the appropriate item in the proposal. Limits of payment for excavation in rock fill are 300mm (1 ft) outside the plant or tree root ball as shown on the drawings.

### 3.04 UNDERGROUND UTILITIES

- A. The Contractor shall be responsible for obtaining plans and locations of utilities and existing underground structures.

### 3.05 WRAPPING

- A. Wrapping of all trees shall be done immediately after they are planted. The trunks of all trees shall be wrapped spirally from the bottom to top with material as specified and shall be adequately secured. The wrapping shall overlap and entirely cover the trunk from the ground to the height of the second branches and shall be neat and snug. Overlap shall be approximately 5 cm (2 in) apart.

### 3.06 PRUNING, MULCHING AND WATERING

- A. Each tree and shrub shall be pruned in accordance with Mongolian Standard for Agriculture MNS 6258-2:2011 Caring of tree and brush seedlings, to preserve the natural character of the plant and in a manner to meet its particular requirements in the landscape plan.
- B. All dead wood, suckers and all broken or badly bruised branches shall be removed. Leaders shall not be cut back. Container grown plants shall not be thinned.
- C. Pruning shall be done with clean, sharp tools. All cuts are to be made flush and clean.

- D. Cuts over 2.5 cm (1 inch) in diameter shall be painted with an approved tree wound paint. Paint shall cover all exposed cambium as well as other exposed living tissue.
- E. Immediately after planting operations are completed, all tree and shrub pits and ground cover beds shall be covered with a uniform 10cm (4 in) layer of bark mulch as indicated on the drawings. All remaining planting beds and disturbed areas where no grass is specified shall be mulched with a uniform 10cm (4 in) layer of bark mulch which shall extend to edging strips, walks, walls, curbs or other hard surfaces or undisturbed areas.
- F. All plant material shall be watered (by flooding) twice during the first 24-hour period after planting.
- G. If a problem should arise with a planting, an anti-transparent shall be applied as directed by the Engineer.

### 3.07 INSPECTION AND ACCEPTANCE

#### A. Inspection for Provisional Acceptance

- 1. Upon completion of work, the Contractor shall request an inspection for provisional acceptance by the Engineer. The request shall be received at least 10 days prior to the requested date for provisional inspection.
- 2. Upon completion of all repairs and replacements by the Contractor as requested by the Engineer, the Engineer shall issue a dated written order of provisional acceptance.

- B. All plantings shall be guaranteed by the Contractor for one year. Provisional acceptance will be given by the Engineer following inspection to ensure compliance with the drawings, details and specifications.
- C. At the end of the guarantee period, a final inspection of the work shall be made to determine the condition of plant materials. All plants not in a healthy growing condition as determined by the Engineer shall be removed from the site and promptly replaced with plants as specified for the original planting at no expense to the Owner.
- D. Plantings replaced at final inspection shall be subject to all requirements in the specifications for the original work including planting, provisional acceptance, guarantee period and final inspection.

### 3.08 CONTRACT CLOSEOUT

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT.

END OF SECTION

## SECTION 02485 (CP-2, CP-3)

## LOAMING AND SEEDING

## PART 1 - GENERAL

## 1.01 SCOPE

- A. The work of this section includes the furnishing of all labor, materials, tools and equipment required to furnish and install loam and seeding in areas as shown on the drawings, unpaved areas disturbed by the Contractor's operations and work, or any cross-country or lawn areas disturbed by the Contractor's operations during the course of construction.
- B. Attention is directed to SECTION VI GENERAL CONDITIONS OF CONTRACT and all sections within DIVISION 1, GENERAL REQUIREMENTS, which are hereby made a part of this section of the Specifications.

## 1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for work described in this section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

## 1.03 REFERENCE STANDARD:

- 1. MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area
- 2. MNS 6263:2011 Checking garden objects and accept for use it. General requirement
- 3. MNS 6265:2011. Phospho-humate mixed fertilizer. Technical requirements
- 4. MNS 6252:3022. Compost and fertilizers for tree nursery
- 5. MNS 5264:2003 "Azofos" bacterial fertilizer. Technical requirement

## 1.04 DEFINITIONS

- A. Definitions shall be as specified in PART I – BIDDING PROCEDURES.

## 1.05 SUBMITTALS

- A. Shop Drawings and/or brochures shall be submitted for all items to be furnished in accordance with the provisions of SECTION 01300, SUBMITTALS.
- B. Submittals required under this section include, but are not limited to the following:
  - 1. Soil test results and recommendations for liming and fertilizing shall be submitted to the Engineer at least 45 days prior to loaming operations.
  - 2. Certification of variety, proportions and percent germination of species in the seed mixture and percentage of crop seeds, weed seeds, noxious weeds and inert matter shall be submitted to the Engineer at least 45 days prior to loaming and seeding operations.

3. Brochures and samples for woven jute mesh netting and erosion control blanket.

#### 1.06 PRODUCT HANDLING

- A. All materials shall be shipped, stored, handled and installed according to MNS 5346:2017 Service of freight and freight forward, written recommendations.

#### 1.07 DESIGN CRITERIA

- A. The materials specified are intended to be standard materials of demonstrated successful performance, as manufactured by reputable concerns. Materials shall be designed and manufactured in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's written recommendations and the Contract Documents. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.

#### 1.08 SEASONS FOR PLANTING

- A. Seeding shall take place as soon as possible after each loam area has been prepared, in accordance with the recommendations of the seed supplier relating to the site conditions and region where seeding is to be done. Seeding shall be prohibited during windy or inclement weather, or in frozen or muddy ground; in general, conditions for seeding shall meet with the approval of the Engineer. This does not relieve the Contractor of the responsibility of providing a growth that is full and healthy, in the opinion of the Engineer.

### PART 2 - MATERIALS

#### 2.01 LOAM

- A. Testing
  1. All loam used in the work of this section of the specifications will be tested and approved for use by the Engineer prior to being spread. Stripped material may be used if approved in accordance with the following requirements. Approved material shall be stockpiled so as not to interfere with the other work and other subgrade or fill materials.
  2. All testing shall be done by an independent test laboratory approved by the Engineer. The Contractor shall provide the laboratory with representative soil samples for testing and send test reports directly to the Engineer.
  3. Loam shall be tested for the following: pH, organics, buffer pH, soluble salts (expressed in millimhos), available Nitrogen, Phosphorous, exchangeable Potassium, Magnesium, Calcium and Sodium, Cation Exchange Capacity, percent H base saturation, percent Ca base saturation, percent M base saturation, and available Zinc, Manganese, Copper, Iron, humus content and soil type. All nutrient results shall be expressed in parts per million (ppm).
  4. Test reports shall also contain specific recommendations as to the exact types and times and rates of application of soil additives and fertilizers based upon the soil test results.



These recommendations shall be followed during lawn construction. All Contractors shall note that any and all materials and procedures, with respect to soil additives and fertilizers, contained herein are approximate and are given to assist bidding and that they will be adjusted to comply with test reports.

- B. Loam shall be a "fine sandy loam", or a "sandy loam" determined by mechanical analysis. It shall be of uniform composition, without mixture of subsoil. It shall be free of stones, lumps, plants and their roots, debris and other extraneous matter over 13mm (0.5 in) in diameter or excess quantities of smaller pieces of the same materials as determined by the Engineer. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well drained areas which have never been stripped before.
- C. No more than 10 percent of loam shall be clay, with organic matter comprising not less than 4 percent, nor more than 20 percent of the total weight per load.
- D. Loam shall not be delivered or worked in a frozen or muddy condition.
- E. Soluble salts shall not be higher than 75 parts per million.

## 2.02 LIME

- A. Limestone shall be standard commercial ground limestone and shall be applied at a rate to be determined by the Engineer subsequent to the testing of loam; however, the rate shall not exceed 0.5 kg/m<sup>2</sup> (4,000 lb/acre). Limestone shall not be installed during windy or inclement weather. Limestone in hydro-seeding operations shall be restricted in building areas. Any buildings or structures discolored or damaged from limestone spray shall be the Contractor's responsibility.
- B. The Contractor shall take whatever precautions are deemed necessary to prevent damage by distribution of limestone. Any damage incurred by the Contractor's negligence shall be repaired at no additional cost to the Owner.

## 2.03 COMMERCIAL FERTILIZER

- A. Commercial fertilizer shall be a standard dry granular mixture, delivered in the manufacturer's containers and containing a guaranteed analysis by weight of Nitrogen, Phosphorous and Potash, applied at the rate to be determined by testing. The fertilizer must meet MNS 6265:2011; MNS 6252:3022 standard requirement.
- B. Contractor can use liquid fertilizer. Liquid fertilizer must meet MNS 5264:2003 standard.

## 2.04 SEED

- A. Grass seed shall be fresh, clean new crop seed. It may be mixed by an approved method on the site or may be mixed by the dealer. If mixed on the site, each variety shall be delivered in the original containers which shall bear the dealers analysis. If the seed is mixed by the dealer, the Contractor shall furnish to the Engineer, the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety. Seed shall be adapted to the Mongolian climate and tested here.

- B. The seed shall be furnished and delivered premixed in the proportions specified below. All seed shall comply with MNS 6260:2011 Growing seeds, cultivation and nursing in lawn area, seed laws.
- C. Grass seed shall be the previous year's crop and in no case shall the weed seed content exceed 1 percent by weight.
- D. The seed mixture specified for slopes are for use on slopes graded at the rate of 4:1 and steeper slopes.
- E. A manufacture's certificate of compliance to the specifications shall be submitted to the Engineer by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and sown until the contractor has submitted the certificates to the Engineer.
- F. Seed Mixture shall conform with standard locally available mix and shall be used for all loamed areas 17 g/m<sup>2</sup> (150 lb/acre). Seed mixture shall be in accordance with the following:  
  
Seed contains mixture of 3 seeds of 2 species of Festuca and sedge (Cyperus).

## 2.05 EROSION CONTROL BLANKET

- A. Erosion control blanket shall be placed on all slopes greater than 3 to 1. Erosion control blanket will be required for the protection of all seed areas or in any area where erosion is a problem.]

## 2.06 WOVEN JUTE MESH NETTING

- A. Woven jute mesh netting shall be placed on all slopes greater than 3 to 1, and all slopes 3 to 1 which are higher than 3 m. Woven Jute Mesh Netting will only be required for the protection of mowable grassed areas or in any other areas where erosion is a problem.

## 2.07 STRAW

- A. Straw for erosion control and moisture retention shall consist of stems or stalks after threshing. Straw shall be kept in place by stakes, netting, pins or liquid coatings as may be required and as approved by the Engineer.

# PART 3 - EXECUTION

## 3.01 SEEDING OPERATIONS

- A. Personnel for lawn work shall be familiar with lawn construction and shall be under the constant supervision of a qualified foreman.
- B. Preparation for Seeding
  - 1. Preparation of Subgrade. After the Engineer has accepted the subgrade, the Contractor shall do whatever additional grading is necessary to bring the subgrade to a true smooth slope, parallel to finish grade or to the level of adjacent existing loam areas. Subgrade

depth for Lawn Areas shall be 150 mm (6 in) while Subgrade depth for Cross Country Areas shall be 100mm (4 in).

2. The top 80 mm (3 in) of the subgrade immediately prior to being covered with loam shall be raked or otherwise loosened and shall be free from stones, rock and other foreign materials 80 mm (3 in) or greater in dimension.
3. Sufficient grade stakes as determined by the Engineer shall be provided to insure correct line and grade of subgrade and of finished grade.
4. Subgrade shall be inspected and approved by Engineer before placing of loam.
5. Loam shall be as specified above and shall be placed and spread over approved areas to a sufficient depth so that after natural settlement and light rolling for lawn areas, the completed work will conform to the lines, grades and elevations indicated.
6. Finish grading. After loam has been spread, it shall be prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter, and stones over 25 mm (1 in) in diameter shall be removed from the loam which shall also be free of smaller stones in excessive quantities.
7. The surface for lawn areas shall then be rolled with a hand roller weighing not more than 148.82 kg per meter of width.
8. During the rolling, all depressions caused by settlement of rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish to the required grade.
9. Subsequent to or during raking of the loam and at least 4 days prior to seeding, lime shall be applied and raked into the soil over all loam areas.
10. After the lime has been applied and worked into the loam, the entire area shall receive an application of commercial fertilizer. Fertilizer shall be spread in advance of seeding by approved mechanical spreading devices and lightly taken into the top of the soil.

#### C. Placement of Seed

1. Seed shall be spread at least 4 days after fertilization of the soil by an approved mechanical method and at the rate of 24.41 kg per thousand square meters or as noted with seed mix. Seed shall be lightly raked into the soil to a depth of approximately 3mm (1/8 in) and no greater than 6mm (1/4 in) and the entire seeded area shall be rolled with a lightweight roller.
2. Seeding shall not be done during windy weather.
3. For lawn areas, seeding shall be done in 3 directions, 2 at right angles to each other, and one diagonally.
4. Culti-packer or approved similar equipment may be used to cover the seed and to form the seed bed in one operation. Due to the small size of the seed in the cross-country mix, the Contractor shall increase the bulk prior to seeding by the addition and thorough mixing of sand, Milorganite or other approved materials.

5. Immediately after seeding, all seeded areas shall be watered to a depth of approximately 100mm (4 in) and shall be covered with a loose, uniform layer of straw or hay.

### 3.02 INSTALLATION OF EROSION CONTROL BLANKET

- A. Erosion control blanket shall be installed in accordance with the accepted practices and the manufacturer's instructions and recommendations by personnel experienced with similar installations. All products and/or fastenings shall be as supplied by or recommended by the manufacturer, subject to approval by the Engineer.
- B. Erosion control blanket shall lay loose on the grade and shall not be stretched or tightened in any direction. The blanket shall conform naturally to the contour and grade of the proposed topography.
- C. Anchor slots, butts with structures, walls, curbs, etc., side and junction overlaps and terminal folds shall be made and fastened in accordance with the manufacturer's recommendations or as directed by the Engineer.

### 3.03 INSTALLATION OF MESH NETTING

- A. Mesh netting shall be installed in accordance with accepted practices and the manufacturer's instructions and recommendations by personnel experienced with similar installations. All products and/or fastenings shall be as supplied by or recommended by the manufacturer, subject to approval by the Engineer.
- B. Netting shall lay loose on the grade and shall not be stretched or tightened in any direction. The netting shall conform naturally to the contour and grade of the proposed topography.
- C. Anchor slots, butts with structures, walls, curbs, etc., side and junction overlaps and terminal folds shall be made and fastened in accordance with the manufacturer's recommendations or as directed by the Engineer.

### 3.04 MAINTENANCE AND PROTECTION

- A. Maintenance shall begin immediately after each portion of the lawn is installed.
- B. Lawns shall be maintained for at least 60 days or as much longer as necessary to establish a uniform stand of the specified grasses.
- C. Maintenance and protection of seeded areas shall consist of temporary protective fences, barriers, signs, watering, weeding, cutting, and reseeded as necessary, as well as maintaining the straw or mesh cover in a uniform layer.
- D. The surface layer of soil shall be kept damp at all times during the germination period. In the absence of adequate rainfall, watering shall be performed two or three times daily or as often as necessary during the germination period and in sufficient quantities to maintain moist soil to a depth of at least 4 inches. Watering shall be done during the heat of the day to prevent the soil from drying out.
- E. After first cutting, watering shall be once per week as necessary to supplement natural rain, to the equivalent of 25mm (1 in) per week, or to 100 mm (4 in) in depth. Weekly inspection

shall be made to determine the moisture content of the soil and the approved schedule shall be adjusted to fit conditions.

- F. At the time of the first cutting, when grass is 100mm (4 in) high, mower blades shall be set at 65mm (2.5 in) high. In subsequent mowings, lawn areas shall be cut to a 65mm (2.5 in) height with not more than 40 percent of the grass leaf being removed. Naturalized seed mixture shall be cut only once per year during dormant periods as recommended by the manufacturer.
- G. All clippings shall be removed after each mowing. Mowing shall be done only in dry weather.
- H. The Contractor shall be responsible for providing a second application of commercial fertilizer should lawn work not be accepted within a 90-day period following the first application of fertilizer.
- I. Excessive weeds shall be removed by methods approved by the Engineer.
- J. The Contractor shall, at his own expense, repair bare spots and/or damage resulting from erosion, gulleys, washouts, or other causes by filling with topsoil and reseeding.
- K. In the event that lawn operations are completed too late in the fall for adequate germination and/or growth of grass, maintenance shall continue into the following spring.

### 3.05 INSPECTION AND ACCEPTANCE

- A. The Engineer will inspect the seeded areas upon written request by the Contractor. The request shall be received at least 10 days before the anticipated date of inspection.
- B. Inspection and acceptance of seeded areas may be requested and granted in part, provided the area for which acceptance is requested is relatively substantial in size and reasonably regular in shape with clearly definable boundaries.
- C. An acceptable seeded area shall be one that has a dense, uniform stand of the specified species. It shall be free of ruts, gullies, bare spots, and the grass areas shall be healthy and free of weeds.
- D. Upon acceptance of the work, the Contractor shall be relieved of further responsibility for care or maintenance of accepted lawns.

### 3.06 DAMAGE AFTER ACCEPTANCE

- A. Any lawns damaged after final acceptance of seeded areas and before project acceptance shall be repaired, reseeded, and maintained as specified above with an inspection and formal acceptance required.

### 3.07 CLEANING UP

- A. When any of this work is done while buildings are occupied, pavements shall be kept clear at all times, and broomed clean to prevent tracking dirt into buildings.

- B. After completion of all landscaping work, all debris and excess material shall be disposed of to the satisfaction of the Engineer. All pavements shall be broomed and hosed clean.

### 3.08 CONTRACT CLOSEOUT

- A. Provide in accordance with SECTION 01700, CONTRACT CLOSEOUT.

END OF SECTION

## SECTION 02672 (CP-1)

## WATER-SUPPLY WELL CONSTRUCTION, DEVELOPMENT AND PUMPING TESTS

## PART 1 - GENERAL

This specification was developed using US and Mongolian codes and standards. These standards, as identified within the body of this Section, shall be used as the basis for determining acceptability of proposed locally or internationally procured materials, equipment and services.

All products, parts, materials, systems, installation, testing and other requirements of these specifications reflect a level of quality required for this project and shall be considered "the intent of the specifications." The selections are not intended to limit the Contractor's selection of locally-sourced materials or systems. The Contractor may submit alternate, similarly effective substitutions, along with evidence that the substitutions meet the intent of the specifications.

The Contractor shall clearly identify which standard they are in compliance with for all submittals. For all materials, equipment and services, the Contractor shall include with its submittal, a reference copy of each technical standard used (including an English translation). All materials shall have conformity markings to indicate compliance with those standards for which they were submitted.

## 1.01 GENERALIZED WATER-SUPPLY WELL DESCRIPTION:

A. Contractor is alerted to the following conditions that may require special consideration in planning, scheduling and executing the well-construction Work:

1. Contractor shall be responsible for obtaining all necessary GoM approvals to construct water-supply wells as specified herein. Contractor shall consider the number, type and timing of approvals and their implications on the progress of Work.
2. Contractor may encounter cobbles, boulders and heaving soils during drilling.
3. Contractor's final well design will be based on the outcome of pilot-borehole drilling.
4. The well screen slot-size shall be properly sized for the formation. Should fine-grained layers be encountered in the pilot boreholes, a section of blank stainless-steel well casing may have to be installed (instead of well screen) to block off the fine-grained layer(s).
5. Contractor shall submit to the Engineer a Proposed Final Well Design Report / Well-Construction Diagram for each proposed production well within 21-days of the completion of the pilot-borehole drilling. The submittal shall include, at minimum, copies of the soil boring log, grain-size distribution curves, borehole geophysics report (including the geophysical log(s), data analysis, results and recommendations) and calculations and rationale for screen slot-size selection, screened interval(s), artificial filter pack selection and filter-pack intervals.



Submitted well designs shall be reviewed and approved in writing by the Engineer prior to proceeding with the installation of the production well.

6. Selection of the appropriate well-screen (slot-size) and artificial-filter pack (diameter) are critical to the success of well construction. To this end, Contractor shall employ a water-well design expert with experience in constructing wells using continuous-slot well screens and manufactured glass beads as artificial filter pack.
7. If the Contractor elects to drill 600-mm diameter boreholes using mud-rotary drilling techniques, Contractor must plan the installation of well materials in such a manner and at such a pace as to prevent collapse of the native formation.
8. Pumping-and-surging techniques shall be required to develop the wells to their maximum efficiency. These techniques shall be employed over the entire length of well screen, which could be as long as 45 meters.
9. For each completed production well, Contractor shall submit to the Engineer a Final Report/Well Construction As-Built Drawing including, at a minimum: plumbness/alignment testing records, well-development records, pumping-test records, pumping-test water-quality reports, records of the performance pumping test, final sand and turbidity test results, final well disinfection test results, video inspection, soil boring log, well installation, an as-built drawing of the well, project photographs and drone surveys, final well coordinates and elevation, and all field notes. The report shall be submitted within 14 days of the completion of completion of the well. Submitted final reports shall be reviewed and approved in writing by the Engineer prior to final approval and acceptance of the production well.
10. Certain aspects of the Work will require round-the-clock work operations, i.e., 24-hours per day, seven-days per week.
11. Construct temporary access to each wellfield, as necessary. This Work is to be performed on an as needed basis with the approval of the Engineer. It is expected that access to a majority of the proposed well locations will be through existing dirt tracks and water crossings without having to construct temporary access tracks. The CP-3 contractor is responsible for constructing the permanent access tracks. Clearing along the temporary access tracks shall not exceed a width of 4 meters each side of the temporary access track centerline. Sitework for stream crossings within the proposed access tracks is to be coordinated with and performed by the CP-3 Contractor. Temporary access construction within the proposed permanent access tracks will require close coordination with the CP-3 Contractor.
12. The CP-1 contractor is required to obtain construction permits from regulatory agencies prior to construction. Any environmental or regulatory issues or directives should be described in these permits and submitted to the Engineer prior to construction.
13. Sitework for temporary access to the 30 well sites at two wellfield locations, is to include construction of temporary drilling platforms, temporary access

tracks, and erosion control. Sitework at stream crossings within the proposed access tracks is to be coordinated with and performed by the CP-3 Contractor.

14. Winter working conditions limit the period of outdoor construction. Work must be performed between 1 April and 15 October, unless authorized in writing by the Engineer.

B. Contractor is alerted to the following Attachments included at the end of this section:

1. Attachment 1: Table 1, Design Pumping Rates and Minimum Specific Capacity for Production Wells.
2. Attachment 2: Table 1, List of Water-Quality Testing Analytes for Performance Pumping Tests; Table 2, List of Water-Quality Testing Analytes for Water-Supply for Construction Purposes.
3. Attachment 3: Report titled “Mongolia II – Bulk Water Supply Expansion, Geophysical-Hydrogeological Investigation, Shuvuun and Biokombinat Wellfields Final Report, December 2019”.
4. Attachment 4: Sample Record and Report Forms
5. Attachment 5: Grain-Size Distribution Curves from 2019 Hydrogeological Investigation.

C. Contractor is alerted to the following items included in the Design Drawings:

1. Wellfield Location Plans for the proposed wells in the Biokombinat and Shuvuun wellfields are included in the Design Drawings, Sheets 0-C-101 through 0-C-106.
2. The Proposed Typical Well Design detail in the Design Drawings, Sheet 0-C-301.
3. Proposed Well Locations and Elevations, summarizing well installation details for the individual proposed wells, including elevations (Design Drawings, Sheet 0-C-301). Elevations are based on 2019 test wells drilled at each proposed well location. The final installation elevations and depths may vary somewhat based on actual field conditions.

D. Following is a general description of the proposed water-supply wells to be installed. A description of the overall project can be found in SECTION 01010 SUMMARY OF WORK.

1. The proposed wells shall be installed at the locations indicated on the Wellfield Location Plans, Design Drawings Sheets 0-C-101 through 0-C-106.
2. A pilot borehole of 150- to 200-mm (6- to 8-inch) diameter shall be installed at each proposed well location in advance of well construction. The purpose of the pilot boreholes is to obtain soil samples for grain-size analysis and to conduct borehole geophysical surveys. Final well designs – specifically, the selection of well-screen slot-size(s) and depth interval(s); artificial filter pack (glass bead) diameter and interval(s); and total depth of well – shall be prepared by the Contractor, subject to the approval of the Engineer, based on the information gathered from the pilot boreholes.
3. Each proposed water-supply well shall be up to 60 meters deep. The exact depth shall depend on the aquifer formation and shall be determined in consultation

with the Engineer. At each well location, a 625-mm diameter (minimum) temporary steel surface-casing shall be installed to a depth of 6-meters (minimum) below land surface (bls) and shall extend 0.5 meters above land surface.

4. At each proposed well location, a 600-mm diameter borehole shall be drilled to the bedrock surface or to a maximum depth of 60 meters bls if bedrock is not reached.
5. Once the 600-mm diameter borehole is drilled, a 450-mm diameter stainless steel well will be installed to the depth approved by the Engineer
6. Each proposed well shall consist of approximately 16 meters of 450-mm diameter stainless-steel well casing extending to a depth of approximately 15 meters below the water table (see table shown on Design Drawing Sheet 0-C-301). A one-meter length of the 450-mm diameter stainless-steel casing shall extend above existing ground. In general, the remainder of the well will consist of 450-mm diameter stainless-steel, continuously wound, wire-wrapped well screen extending from the bottom of casing to the total depth of the borehole. However, should fine-grained layers be encountered in the pilot boreholes, a short-section of blank stainless-steel well casing may have to be installed (instead of well screen) to block off the fine-grained layer(s).
7. Once the well screen and casing is installed, a properly sized glass-bead artificial filter pack shall be installed in the annulus between the 450-mm well and the 600-mm borehole wall. The artificial filter pack shall be installed from the bottom of the well screen to 1 to 2 meters inside the temporary casing.. If a short-section of blank well casing is required (see 1.01F, directly above), an alternate filter pack, such as a processed sand, may be required instead of glass beads.
8. A sanitary well seal shall be installed in the annulus between the well casing and the borehole wall extending from the ground surface to approximately 6 meters bls. Approximately one meter of transition pack shall be placed directly below the well seal and directly above the artificial filter pack to prevent infiltration of the well seal into the filter pack. The approximate installation elevations are specified on the table shown on Design Drawing Sheet 0-C-301 .
9. The proposed typical well design detail is included in the Design Drawing Sheet 0-C-301. This detail shall be used with reference to individual well elevations. Fabrication and delivery of the well screen and well casing is expected to take several weeks. Delivery of manufactured glass beads could take several months. Water-supply well construction shall not commence until all materials of construction are on site and inspected and approved in writing by the Engineer. Refer to Sections 01500, 01600 and 01610 for details of materials delivery, storage and handling,

To facilitate construction and avoid delays due to delivery of materials, the Contractor is alerted to the following. Based on the limited grain-size analyses performed during the 2019 Hydrogeologic Investigation, 80-slot well

screens and 5- to 6-mm diameter artificial filter pack may be an adequate design for most of the soils encountered. Refer to Section 02672, Paragraphs 3.06.I.4 and 3.06.K.5.

10. Each well shall be located where directed by the Engineer and be constructed in accordance with these specifications. Drilling operations shall be carried out so as to prevent aquifer contamination. Drilling operations and equipment shall not cause intra- and inter-aquifer contamination, nor vertical seepage of surface water into the borehole, especially the well intake zone. The management of water will be necessary as the site is level and other work and contractors will be working in the area. Furthermore, certain well sites may be subject to periodic flooding. During the 2019 field investigations, flooding occurred in the wellfields limiting access to some of the test well sites, particularly in the Biokombinat Wellfield. Drilling and well construction shall be a continuous process with minimal downtime from start of drilling to completion of the well construction. All construction equipment shall be present on site at the start of drilling and well construction to minimize downtime. It is suggested that the Contractor monitor rainfall and stream gauge stations during construction as this may provide an early indication of flooding conditions.
11. Drilling challenges were encountered during the Hydrogeologic Investigations of 2019. During well installation, Contractor shall expect to encounter cobbles, boulders, and heaving soil below the water table. Refer to the Mongolia II – Bulk Water Supply Expansion, Geophysical-Hydrogeological Investigation, Shuvuun and Biokombinat Wellfields Final Report (December 2019) for a description of subsurface conditions at each location. Copies of the reports as well as other pertinent data are provided in Attachment 3 as part of the specification package.
12. Notification and Permitting. The Contractor shall notify Engineer 14 (fourteen) days prior to commencement of the Work. The Contractor shall prepare and submit the necessary permit applications with the appropriate authorities of the GoM, local government and private parties in writing, and notify these authorities of the type and location of Work to be constructed, the method of construction and anticipated schedule for construction of the Work. **Contractor shall not begin any Work or elements of the Work until all written permissions and/or approvals have been received from authorities of the GoM (Tuul River Basin Authority, or other appropriate agency), local government, private parties and the Engineer. A permit for drilling the final production wells will need to be obtained from the Tuul River Basin Authority.**
13. **Abandonment** of Wells: If the Contractor fails to construct a well of the required capacity, or if the well is abandoned because of loss of tools, unacceptable plumbness/alignment or for any other cause, it is the Contractor's responsibility to notify the appropriate agencies of the well abandonment, as necessary and as reviewed by the Engineer. All well abandonment procedures shall be reviewed by the Engineer and performed by the Contractor at no additional cost to the Owner.

14. **Work Zone:** CP-1 Contractor will have a 100-meter radius work zone around each proposed production site from issuance of the Notice to Proceed until the final production well has been accepted by the Engineer. The CP-3 contractor will not be allowed to access or work within this Work Zone until the final production well has been completed and accepted by the Engineer. Once the final production well has been accepted by the Engineer, the work zone and the completed production well will be handed over to the CP-3 Contractor.
15. **Defects Liability Period:** Once the final production well has been accepted by the Engineer, the CP-1 Contractor's Defects Liability Period for the final production well will begin. Damage to, and repair(s) of, the final production well by the CP-3 Contractor and others will not be the responsibility of the CP-1 Contractor.

1.02 **MEASUREMENT AND PAYMENT:**

- A. Measurement and payment for work described in this Section will be made in accordance with the provisions of SECTION 01025, MEASUREMENT AND PAYMENT.

1.03 **REFERENCES:**

- A. All Work specified herein shall conform to or exceed the requirements of the applicable codes and standards relating to the referenced portions of the following documents only to the extent that the requirements therein are not in conflict with the provisions of this Section. Where such documents have been adopted as a code or ordinance by the public agency having jurisdiction, such a code or ordinance shall take precedence.
- B. American Water Works Association (AWWA):
  1. AWWA A100-15: (2015) Water Wells
  2. AWWA B300: (2018) Hypochlorites
  3. AWWA B301: (2018) Liquid Chlorine
  4. AWWA C654: (2013) Disinfection of Wells.
  5. AWWA C655: (2018) Field Dechlorination
- C. ASTM International (ASTM):
  1. ASTM A312/A312M: (2015) Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
  2. ASTM A778/778M – 16 (2016) Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products
  3. ASTM C136/C136M - 19: (2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

4. ASTM D2487 - 17: (2017) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
  5. ASTM D2488 – 17e1: (2017) Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
  6. ASTM D4750: (1987; R 2001) Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)
- D. ASME INTERNATIONAL (ASME):
1. ASME B31.1: (2014; INT 1-47) Power Piping
- E. National Sanitation Foundation (NSF) International
- F. Construction norms and standards of Mongolia.
1. BNbD 40.02.16 Provisions 7.4-7.25 Appendix 1;2
  2. BNbD 40.04.16 Provisions 6.27-6.40
  3. CCM 40-02-16 Water supply, outdoor pipelines and facilities
  4. CCM 83-26-00 Drilling of water wells
  5. MNS 6088:2010 Borehole drilling and equipment installation. Technical requirements.
  6. MNS 0346:2000 Construction gravel and crushed gravel. General requirements.
  7. MNS ISO 5667-5:2001 Guidance on Sampling Drinking Water
  8. MNS ISO 5667-3 Preservation and Handling of Water Samples
  9. MNS ISO 4867:99
- G. Welding Standards:
1. AWS D1.1/D1.1M:2020 Structural Welding Code - Steel
  2. MNS ISO 3834-1:2010 Quality requirements for fusion welding of metallic materials. Part 1: Criteria for the selection of the appropriate level of quality requirements
  3. MNS ISO 3834-2:2010 Quality requirements for fusion welding of metallic materials. Part 2: Comprehensive quality requirements
  4. MNS ISO 3834-3:2010 Quality requirements for fusion welding of metallic materials. Part 3: Standard quality requirements
  5. MNS ISO 3834-4:2010 Quality requirements for fusion welding of metallic materials. Part 4: Elementary quality requirements

6. MNS ISO 3834-5:2010 Quality requirements for fusion welding of metallic materials. Part 5: Documents with which it is necessary to conform to claim conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4
7. MNS ISO 6947 : 2003 Welds. Working positions. Definitions of angles of slope and rotation
8. MNS ISO 9013 : 2001 Welding and allied processes. Quality classification and dimensional tolerance of thermally cut (oxygen/fuel gas flame) surface
9. MNS ISO 9956-1 : 2003 Specification and approval of welding procedures for metallic materials. Part 1: General rules for fusion welding
10. MNS ISO 9956-2 : 2003 Specification and approval of welding procedures for metallic materials. Part 2: Welding procedure specification for arc welding
11. MNS ISO 9956-3 : 2003 Specification and approval of welding procedures for metallic materials. Part 3: Welding procedure tests for arc welding of steels
12. MNS ISO 9956-4 : 2003 Specification and approval of welding procedures for metallic materials. Part 4: Welding procedure tests for arc welding of aluminum and its alloys
13. MNS ISO 9956-5 : 2003 Specification and approval of welding procedures for metallic materials. Part 5: Approval by using approved welding consumables for arc welding
14. MNS ISO 9956-6 : 2003 Specification and approval of welding procedures for metallic materials. Part 6: Approval related to previous experience

#### 1.04 SUBMITTALS:

All Contractor submittals shall conform to the applicable requirements of the Submittals Procedures (SECTION 01300 SUBMITTALS), and the supplementary requirements specified. Each item identified below shall be submitted to the Engineer with a clear explanation or depiction of why or how the requirements, as listed, will be fulfilled by the products or services provided by the Contractor. These items are not considered all-inclusive and may be extended by the Owner, Engineer, or Contractor. The Contractor shall submit the following documentation to the Owner and Engineer within the timeframe noted below. Each submittal shall be accompanied with a Submittal Record detailing what is included in each submittal. All submittals shall be delivered to Engineer in English:

A. Submit the following in accordance with SECTION 01300 SUBMITTALS.

1. The Contractor shall submit a copy of his special license "Borehole drilling, furnishing and restoring" issued by Ministry of Environment and Tourism to install potable water-supply wells and/or certification issued by the GoM. (Refer to Section 02672, Paragraph 1.07 A.1.) – With the Contractor's qualification materials to be submitted with Contractor's BID.



2. Permits to Construct the Water-Supply Wells and other legal requirements (Refer to Section 02672, Paragraph 1.01 D.12 and 1.09) – No less than 14 days before commencement of the Pilot Borehole drilling.
3. Subcontractors List (Refer to Section 02672, Paragraph 1.05) - With the Contractor's qualification materials to be submitted with Contractor's BID.
4. Qualifications (Refer to Section 02672, Paragraph 1.07 A.2, A.3, A.4 and A.5) - With the Contractor's qualification materials to be submitted with Contractor's BID.
5. Well Installation Plan (Refer to Section 02672, Paragraph 1.08) – Within 14 days of the Notice to Proceed.
6. Drilling Fluids Plan (Refer to Section 02672, Paragraph 1.08 C.3 and C.4) – With the Well Installation Plan.
7. Daily Activities Logs (Refer to Section 02672, Paragraph 3.06 F.) – Weekly once Work begins.
8. Proposed Final Well Design Report/Well-Construction Diagram (Refer to Section 02672, Paragraph 3.05 G.)– Within 21 days after completion of the pilot borehole at each well site.
9. Final Report/Well Construction As-Built Drawing (Refer to Section 02672, Paragraph 3.06.N) – Within 5 days after completion of the performance pumping test.

B. Product Data Submittals

1. Stainless Steel Well Screen Product Data from Manufacturer (Refer to Section 02672, Paragraph 2.05) - With the Well Installation Plan
2. Stainless Steel Well Casing Product Data from Manufacturer (Refer to Section 02672, Paragraph 2.04) - With the Well Installation Plan
3. Products Proposed for Joining Sections of Well Casing and Screen (Refer to Section 02672, Paragraph 2.04 and 2.05) – With the Well Installation Plan
4. Artificial Filter Pack (Refer to Section 02672, Paragraph 2.06) - With the Well Installation Plan
5. Transition Pack (Refer to Section 02672, Paragraph 2.07) – With the Well Installation Plan
6. Well Sealant (Refer to Section 02672, Paragraph 2.08) - With the Well Installation Plan
7. Well-Screen Slot-Size Submittal Specifications (Refer to Section 02672, Paragraph 3.05 G.3.) – With the Proposed Well Construction Diagram for each production well.

8. Samples of Proposed Artificial Filter Pack (Refer to Section 02672, Paragraph 2.06) - With the Proposed Well Construction Diagram for each production well.
9. Samples of Transition Pack (Refer to Section 02672, Paragraph 2.07) - With the Proposed Well Construction Diagram for each production well.
10. Drilling Fluids (in Drilling Fluids Plan)

C. Test Reports and Other Documentation

1. Maintain on-site up-to-date copies of all field notes, data and logs (e.g. geologic logs or pumping test records) for review by the Engineer upon demand.
2. Source of Drilling Water – Water-Quality Test Results (Refer to Section 02672, Paragraph 1.16) – Disinfection and sampling to occur no more than one (1) week before use of water. Results reported within three (3) days after collecting water samples.
3. Grain-Size Distribution Curves for native soils shall be submitted to the Engineer for review within 21 days of the soils sampling (Refer to Section 02672, Paragraph 3.05 E.) - With the Proposed Well Construction Diagram for each production well.
4. Borehole Geophysical Report (Refer to Section 02672, Paragraph 3.05 F.) - With the Proposed Well Construction Diagram for each production well.
5. Geologic Logs (Refer to Section 02672, Paragraph 3.05 C.) - With the Proposed Well Construction Diagram for each production well.
6. Plumbness/Alignment Testing Records (Refer to Section 02672, Paragraph 3.06 H and J.) – Within two (2) days after completion of each test.
7. Well-Development Records (Refer to Section 02672, Paragraph 3.12G. Well Development Records)- Within two (2) days after completion of development.
8. Pumping-Test Records (Refer to Section 02672, Paragraph 3.08 A.4.) - Within two (2) days after completion of the pumping test.
9. Pumping-Test Water-Quality Reports (Refer to Section 02672, Paragraph 3.08 B. and Table 1 in Attachment 1) – Within three (3) weeks after completion of each pumping test.
10. Final Sand and Turbidity Test Results (Refer to Section 02672, Paragraphs 3.07.H and 3.08 C.) - Within two (2) days after each test.
11. Final Well Disinfection Test Results (Refer to Section 02672, Paragraph 3.10) - Results reported within three (3) days after collecting water samples.
12. Video Inspection (Refer to Section 02672, Paragraph 3.09) - Within two (2) days after completion of the inspection.

13. Borehole Logs (for Water-Supply Wells) and Well Installation Diagrams (As-Built Drawings) (Refer to Section 02672, Paragraphs 3.12 E and F for specific requirements.) – Within seven (7) days after completion of each well construction.
14. Abandonment Record (Refer to Section 02672, Paragraph 3.12 H.) - Within seven (7) days after completion of abandonment.
15. Project Photographs and Drone Surveys (Refer to SECTION 01380, CONSTRUCTION PHOTOGRAPHS, VIDEO AND DRONE SURVEYS) – Submitted weekly within seven (7) days after completion of well-construction activities of the previous week.
16. Final Well Coordinates and Elevations of Constructed Well Components (Refer to Section 02672, Paragraph 3.06 M) – Submitted with the As-Built Drawings.

D. Blank Forms/Templates

1. See WELL INSTALLATION PLAN, Paragraph 1.08, below.

1.05 SUBCONTRACTORS LIST:

- A. The Contractor shall submit a complete list of all proposed subcontractors to be used in the Work with his qualification's materials. The Contractor may be required to submit additional information or a resume of qualifications for any of the subcontractors proposed.

1.06 COMPLIANCE WITH GOVERNMENTAL REGULATIONS:

- A. The Contractor shall fully inform themselves of all local ordinances, and GoM laws and regulations, and interpretations of these laws, ordinances and regulations by a governmental body or agency which in any manner may affect the Work specified herein.
- B. The Contractor, upon first awareness of a possible conflict, shall notify the Owner and Engineer of inconsistency or incompatibility between the Specifications and local ordinances.
- C. The Contractor shall at all times comply with said ordinances, laws and regulations, and protect and indemnify the Engineer and their officers and agents against any claim or liability arising from or based on the violation of such laws, ordinances, or regulations. All permits, licenses, and inspection fees necessary for protection and completion of the Work shall be secured and paid for by the Contractor unless otherwise specified.
- D. The Contractor shall obtain any other local or GoM drilling permits or occupational licenses and provide notifications to local municipalities and agencies prior to the start of well construction activities.
- E. The Contractor shall also conform to any local ordinances pertaining to noise levels and working hours, etc. to avoid any unnecessary delays.

- F. The Contractor will not receive additional compensation for a delay in the project occurring due to delay of permit acquisition.

1.07 QUALITY ASSURANCE:

- A. Qualifications: To demonstrate his Qualifications to perform the Work specified, the Contractor shall submit the following documentation to Owner and Engineer with his qualification's materials.

1. Contractor License/Certification (to be submitted with Contractor's BID):

- a. The Contractor shall be properly licensed and/or certified by the GoM to install potable water-supply wells of the type specified. The Contractor shall submit a copy of his license and/or certification.

2. Contractor's Health and Safety:

- a. The Contractor's staff shall include appropriate health and safety personnel and planning, as specified in SECTION 01030, SPECIAL REQUIREMENTS.

3. Contractor Experience Record (to be submitted with Contractor's BID):

- a. The Contractor shall submit a complete list of potable water-supply wells he has installed in unconsolidated aquifers in Mongolia and other countries in the last two years, including the site location, the date of installation, the diameter and depth of the well, the well yield, and the type of drilling method. The Contractor shall submit a complete list of pumping tests conducted in the last two years, including the location, the diameter and depth of the well, the length of the pumping test and the pumping rate.

4. Well Driller Experience Record (to be submitted with Contractor's BID):

- a. The Contractor shall submit the name and experience record of each well driller to be employed on this project. Well drillers engaged on the Project shall be experienced in the construction of potable water-supply wells of the type specified having satisfactorily constructed at least three (3) such wells in the last two years. Well drillers engaged on the Project shall be experienced in conducting continuous pumping tests of the type specified herein, having satisfactorily performed at least three (3) such pumping tests in the last two years.

5. Professional Hydrogeologists (to be submitted with Contractor's BID):

- a. The Contractor shall employ a sufficient number of Professional Hydrogeologists licensed by the GoM and experienced in water-well construction. The number of Professional Hydrogeologists shall be based on the number of drilling rigs mobilized simultaneously and the hours of drilling operations. If more than one drilling rig is mobilized or if drilling operations are conducted for more than 12 hours per day, more than one Professional Hydrogeologist will be required. In the drilling of the pilot

boreholes, one Professional Hydrogeologist shall be assigned to each rig on a full-time basis. Under no circumstances shall a Professional Hydrogeologist be assigned to more than one drilling rig during pilot-borehole installation.

- b. The Professional Hydrogeologists shall perform the duties required by the GoM during the drilling and installation of pilot boreholes, the proposed water-supply wells and the pumping tests. After the wells are constructed and the pumping tests are completed, the Professional Hydrogeologists shall prepare and submit the reports and documentation required by the GoM.
- c. The Contractor shall employ, at a minimum, one Professional Hydrogeologist experienced in water-well design and construction in granular, unconsolidated aquifers, who is fluent in both English and the language of the Contractor's well-drilling crew and management staff. All pilot-borehole activities, well-drilling, well-construction, well-development, pumping-test and other project activities shall be done under the direct supervision of the qualified English-speaking Professional Hydrogeologist, on a full-time basis.
- d. The Contractor shall submit the names, experience records and certification of all Professional Hydrogeologists proposed for this project, properly licensed by the GoM (with Contractor's qualifications materials). Each Professional Hydrogeologist shall be approved by the Engineer. The proposed drilling schedule and proposed Professional Hydrogeologist(s) Work schedules shall also be submitted.

#### 1.08 WELL INSTALLATION PLAN:

- A. The Contractor shall submit a Well Installation Plan within 14 days after the Notice to Proceed. The Plan shall contain a description of Contractor's overall approach for the proposed pilot and finished boreholes, and constructing water-supply wells. The Plan shall also include a detailed description of Contractor's proposed means and methods for completing the Work specified herein, including photographs and/or drawings of the proposed equipment, tools, and supplies required to drill, sample, construct, develop, test, pump and inspect the Work.
- B. The Well Installation Plan shall be approved and signed by an experienced Professional Hydrogeologist with expertise in water-well design and construction, and by the Engineer.
- C. The following shall be incorporated into the Contractor's Well Installation Plan and followed in the field. The plan shall include, but shall not be limited to, a discussion of the following:
  - 1. Proposed pilot borehole drilling, including methods of borehole installation, borehole diameter, soil-sampling, grain-size analysis, borehole geophysical surveying and borehole abandonment. It shall also include samples of the proposed report forms (geologic logs, grain-size analysis, borehole geophysical surveys, etc.)

2. Description of proposed well-drilling methods for water-supply well boreholes, including methods to overcome well drilling challenges, well-installation procedures, including temporary casings proposed, well casing and screen installation, placement of artificial filter pack, transition pack and seal materials. It is recommended that the Contractor include a detailed description, including photographs, of the drilling rig and equipment proposed to perform the Work.
3. The Contractor shall prepare a written Drilling Fluids Plan, subject to the review of the Engineer. The Drilling Fluids Plan shall describe the proposed additives to be used in the drilling fluid (for example, soda ash, bentonite, polymer); the proportions of these additives and method of mixing; and the proposed drilling fluid properties (pH, drilling-fluid weight, fluid-loss, viscosity and calcium content). The Drilling Fluids Plan shall also explain how the drilling fluids will work in harmony with the Contractor's drilling equipment with the overall goal of stabilizing the boreholes. The Drilling Fluids Plan shall describe the additives to be used to break down the filter cake once the well screen is installed and well development commences. Finally, the Drilling Fluids Plan shall include the name and experience record of the Drilling Fluids Engineer(s) who will monitor the drilling fluids for optimal performance throughout the drilling and well-construction process. It is recommended that the Contractor include a detailed description, including photographs, of the drilling mud mixing and circulation equipment proposed to perform the Work.
4. In the Drilling Fluids Plan, the Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives.
5. The Contractor shall submit for approval product data (see PART 2 – PRODUCTS) for: stainless steel well-casing and well-screens, centralizers and the products proposed for joining sections of well casing and screen (e.g., couplings or welding rods); water-supply source; artificial filter pack, transition pack; well sealant to be placed between the well casing and the borehole wall.
6. Description of methods to be used to test for plumbness and alignment., in conformance with Paragraphs 3.06 H and J of this specification.
7. Description of methods and quality control procedures to be used for placement of the artificial filter pack, transition pack and seals in the borehole, including depth measurements.
8. Description of well development methods to be used, in conformance with Paragraphs 3.07 and 3.12G of this specification.
9. Description of performance pumping-test methods, in conformance with Paragraph 3.08 of this specification.
10. Blank Forms/Report Templates, including: Borehole Log form (for water-supply wells); Geologic Log form, Grain-size Distribution Curves, Borehole Geophysical Report form (for pilot boreholes); Final Well Design Report/Proposed Well Construction Diagram Template; Well-installation Diagram Template (As-Built Drawings), Plumbness and Alignment Test Record form; Well-development record form; Water-quality Sampling form;

Pumping-test record form, Sand and Turbidity Testing form; Daily Activities Logs, Well Abandonment record form, and blank forms (paper and electronic spreadsheets) of tally sheets for drill strings, casings, tremie tubing cement, additives, filter pack materials, etc.

11. Description of contamination prevention, and well materials and equipment decontamination procedures.
12. Description of protective cover, surface completion procedures, including any special design criteria/features relating to frost heave prevention. The maximum frost penetration for the site shall be included in this description.
13. Description of water management methods, including any special design criteria/features relating to managing water from well drilling activities as well as pumping tests.
14. List of applicable publications, including GoM and local regulations and standards.
15. List of personnel assignments for this project, and personnel qualifications.
16. Description of well abandonment procedures.
17. Contractor's Health and Safety procedures.
18. Proposed source of water-supply for drilling.
19. Descriptions, materials of construction, drawings and layouts of proposed temporary drilling platforms and temporary access tracks, in conformance with Paragraph 3.04 D of this specification.
20. Floor plans, layouts, and other details related to temporary Field Offices, specified in SECTION 01500, TEMPORARY FACILITIES.
21. Details, descriptions, plans and layouts to be used for erosion and sedimentation control, as specified in SECTION 01568.

#### 1.09 PERMITS:

- A. Submit to Engineer a copy of all permit approvals, licenses, or other legal authorizations necessary to execute the Work. To this end, before beginning Work, the Contractor shall prepare and submit the necessary permit applications with the appropriate authorities of the GoM (Tuul River Basin Authority, or other appropriate agency), local government and private parties in writing, and notify these authorities of the type and location of the Work to be constructed, the method of construction and anticipated schedule for construction of the Work.
- B. Contractor shall not begin any Work or elements of the Work until all written permissions and/or approvals have been received from authorities of the GoM (Tuul River Basin Authority, or other appropriate agency), local government, private parties and the Engineer. A permit for drilling the final production wells will need to be obtained from the Tuul River Basin Authority.**



#### 1.10 DELIVERY, STORAGE AND HANDLING:

- A. Comply with the requirements in SECTION 01610.
- B. Store and maintain well materials in a clean, uncontaminated condition throughout the course of the project.
- C. Well materials shall be stored indoors for inspection by the Engineer until such time as the materials are needed to construct the individual wells.
- D. Once the well materials arrive at a well-construction site, they shall be staged on wooden timbers or beams, shipping pallets or other suitable structures to prevent contact with the ground. Well materials shall be covered with heavy-duty plastic or tarpaulins to keep them from exposure to the elements, i.e., wind, rain, dust, etc. Filter pack material shall not be allowed to freeze before installation.

#### 1.11 SITE CONDITIONS:

- A. Access to each well site, including any utility clearance, permits, licenses, or other requirements and the payment thereof necessary for execution of the Work, is the responsibility of the Contractor. Prior to mobilization, the Contractor shall visit each proposed well location to observe any condition that may hamper transporting equipment or personnel to the site. If clearing, or relocation is necessary, the Contractor, and the Engineer shall agree on a suitable clearing, and/or the location of any required access road.

##### 1. Soil and Groundwater Conditions:

- a. A description of existing subsurface conditions experienced during geotechnical and aquifer pump test investigations are provided in the reports titled: Mongolia II – Bulk Water Supply Expansion, Geophysical-Hydrogeological Investigation Shuvuun and Biokombinat Wellfields, Final Report, dated December 2019, found in the Attachment 3 at the end of this Section.
- b. The Contractor must anticipate difficult drilling conditions with low drilling advancement rates through sand, gravel, cobbles, boulders, and heaving soil conditions below the water-table. In addition, flooding conditions were experienced in the summer of 2019 during the hydrogeologic investigation and these conditions could be repeated. It is suggested that the Contractor monitor rainfall and stream gauge stations during construction as this may provide an early indication of flooding conditions.

#### 1.12 OTHER GENERAL REQUIREMENTS:

- A. The Contractor shall coordinate all his Work with the Engineer. When coordinating the Work in the field, the Contractor shall include the English speaking Professional Hydrogeologist, as well as the Contractor's drilling foremen, to avoid miscommunication and misunderstanding.

- B. The Contractor shall take all necessary precautions for the safety of employees on the Work and comply with all applicable provisions of applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed.
- C. The Contractor shall comply with applicable licenses and permits related to environmental protection.
- D. The Contractor shall coordinate with the Engineer regarding setup at each drilling location and confine his activities to areas designated by the Engineer.
- E. The Contractor shall be fully informed of the conditions relating to construction and labor under which Work will be or is now being performed and employ such methods and means in the carrying out of this Work as will not cause any interruptions or interference with any other Work at the Site.
- F. The Contractor shall keep a copy of the Contract Documents at the Site of the Work at all times while work is being performed.
- G. The Contractor shall provide whatever additional equipment and manpower as may be necessary in order to complete the project.
- H. The Contractor shall make all arrangements for and furnish at his own expense all telephone or other utility required for construction purposes.

#### 1.13 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall carefully protect all Work so that no injury will come to it from flood water, rain, frost, ice, accident or other cause. Any injury to the Work shall be repaired at no expense to the Owner. The Contractor shall protect the Owner's property from injury or loss arising in connection with this Project and make good any damage, injury, or loss. The Contractor shall adequately protect adjacent and/or private property as provided by law and the Contract Documents.
- B. The Contractor shall not release petroleum products including petrol, diesel, motor oil, brake fluid, as well as engine coolant and antifreeze to the environment. To this end, the Contractor shall furnish, install and maintain, for the life of the Project, secondary containment for all fluids and drilling fluid additives stored on site. Secondary containment shall be provided for fluids stored in drums and buckets. Secondary containment shall have a capacity to hold 150 percent of the volume of the fuel containers. The Contractor shall leave no more than 20 liters of fuel in any piece of equipment that is unattended overnight and/or over weekends, holidays, or periods of no-work. The Contractor shall furnish, place and maintain polyethylene sheeting of minimum 30-mil thickness under all equipment containing fuel or other hazardous materials. Polyethylene sheeting shall be placed in one piece; joining of separate pieces will not be acceptable. Non-stationary equipment shall be parked over the sheeting at all times when it is not in use. The Contractor shall discuss with the Engineer in advance secondary containment of the fuel to be used during the pumping test.

- C. Proposed production wells that are installed but not accepted by the Engineer, or accepted wells where the CP-3 Contractor has not started construction by October 1st, will be marked with steel witness pole(s) and covered with 2 meters of fill to a horizontal distance of 2 meters radius by the CP-1 Contractor. Witness poles will be welded to the side of the well casing and painted fluorescent red. The fill is to help protect the well from winter freezing conditions. The witness pole(s) are to extend above the fill by 1 meter to mark the locations of the production wells. This will require coordination between the CP-1 Contractor, CP-3 Contractor, Engineer and MCA. Refer to Design Drawings Sheet 0-C-302, Temporary Embankment design details.

#### 1.14 VISIT TO THE SITE:

- A. Before mobilizing, the Contractor shall visit the proposed sites, examine conditions and become thoroughly acquainted with the conditions for performing the Work. The Contractor shall study the technical specifications and compare the same with the information gathered during the examination of the Site, as no extra compensation will be authorized for extra Work caused by unfamiliarity with the Site and/or specifications or the conditions peculiar to this Project.

#### 1.15 CLEANUP:

- A. During the course of the Work, the Contractor shall keep the Site in a clean and neat condition and shall legally dispose of all residues resulting from the construction Work and, at the conclusion of the Work, shall remove and legally dispose of any surplus materials and any other refuse remaining from the construction operations. At the conclusion of the Project, the Contractor shall remove temporary drilling platforms and access tracks and leave the entire Site of the Work in a neat and orderly condition, subject to the approval of the Engineer.

#### 1.16 WATER SUPPLY FOR CONSTRUCTION PURPOSES:

- A. Water needed for construction purposes, including water needed for drilling fluids, well sealants and other purposes, is the sole responsibility of the Contractor.
- B. The Contractor is encouraged to use groundwater from the test or observation wells installed in 2019, and located adjacent to each proposed water supply well. One of two types of test wells are present: either 273- or 300-mm diameter. These wells are capable of producing water at a rate of at least 33 liter per second (l/s). Should the Contractor choose to use this water for drilling purposes, he must first chlorinate the well for 12 to 24 hours and then test the water for those analytes shown on Table 2, Attachment 2, which include field parameters, microbiological parameters, volatile organic compounds (VOCs), and petroleum compounds. The Contractor shall provide pumps and all necessary equipment to obtain groundwater. In addition, Contractor may need to pay the GoM for the use of the water resources.
- C. If the Contractor elects to use an off-site source of water, it is the Contractor's responsibility to identify the source, obtain the water, and ensure the water quality meets the requirements for the prescribed use. The Contractor shall be responsible for taking water-quality samples and providing results to the Engineer for approval prior to any water use (shown on Table 1, Attachment 2).

- D. The use of surface water for borehole drilling or well installation is not permitted.

#### 1.17 PRECONSTRUCTION AND PROGRESS MEETINGS

- A. Refer to Specification Section 01200 PROJECT MEETINGS.
- B. Progress meetings shall be held weekly.

#### 1.18 FINAL WELL-ACCEPTANCE CRITERIA

- A. Each well shall meet the following Final Well-Acceptance Criteria before acceptance by Engineer:
  - 1. All Work shall be completed for each well in conformance with these specifications;
  - 2. At the conclusion of well development, the maximum specific capacity has been achieved for each well;
  - 3. Each well shall achieve the design pumping rate listed in Attachment 1, Table 1, as measured continuously throughout the performance pumping test;
  - 4. Each well shall meet the minimum specific capacity listed in Attachment 1, Table 1, as measured at the end of the performance pumping test;
  - 5. Each well shall be free of bacteria at the end of the performance pumping test;
  - 6. Each well shall meet the criteria for turbidity and sand content specified in Section 02672, Paragraphs 3.07G and 3.08 C;
  - 7. Each well shall meet the plumbness and alignment criteria set forth in Section 02672, Paragraphs 3.06 H and 3.06 J;
  - 8. Each well shall be free of damage or defects based on video inspection or other observation;
  - 9. Each well seal is free of damage or defects;
  - 10. All required records are properly completed and submitted.

### PART 2 - PRODUCTS

#### 2.01 WELL MATERIALS - GENERAL:

- A. All casing, screen, and other well material shall be of compatible materials to prevent galvanic reaction between components of the completed well.
- B. All materials shall be sized appropriately to create a finished water-supply well that maximizes well efficiency (specific capacity) and produces clear water that is free of turbidity and sand.
- C. All casing, screen and other well materials shall be new, clean and free from defects.

## 2.02 DRILLING FLUIDS:

- A. The drilling fluids selected must achieve the following overall goals:
  - 1. Maintain borehole stability during drilling;
  - 2. Balance the need for borehole stability with the need to minimize intrusion of the drilling fluid into the formation;
  - 3. Enable complete removal of the drilling-fluid cake from the borehole wall during well development to maximize well efficiency.
- B. In addition to these overall goals, the drilling fluids shall be:
  - 1. Water-based and suitable for use in the drilling of potable water-supply wells of the type specified herein.
  - 2. Suitable for maintaining the stability of boreholes of the depth and diameter specified herein and preventing fluid loss.
  - 3. Suitable for removing all soil cuttings from around the drill bit and lifting them out of the borehole into the drilling-fluid tubs or pits.
  - 4. Allow soil cuttings to settle out in the drilling-fluid tubs or pits.
  - 5. The Contractor shall submit for review product data and the name of the supplier for the proposed drilling fluids and additives in the Well Installation Plan within 14 days of receipt of the Notice to Proceed.

## 2.03 TEMPORARY WELL CASINGS:

- A. Temporary casings shall be steel, have a minimum diameter of 625-mm, a minimum wall thickness of 6.4-mm, and be suitable for full penetration welds using methods and welding materials, as specified in ASME B31.1, AWS D1.1/D1.1M and MNS ISO 9956-2:2003 Technical requirements for metal welding and approvals, if welding is necessary. Temporary casings that are damaged, dented, out-of-round, crimped, or otherwise unsuitable shall be rejected by the Engineer.
- B. Steel guide centralizers of a design reviewed by Engineer shall be used to maintain proper spacing between the walls of all temporary steel casings.

## 2.04 PERMANENT STAINLESS STEEL WELL CASING:

- A. Permanent well casing shall be new Type 304 stainless steel, with an inside diameter of 450-mm and a wall thickness of not less than 9.6-mm. Well casing shall meet the requirements of ASTM A778/A778M, or Engineer approved equal, and shall be compatible with the stainless steel well screen. Well casing shall be round and straight without crimping or damage.
- B. All permanent and temporary casings shall be joined by stainless-steel materials, specifically, factory-installed threaded couplings, double spline-lock couplings or full penetration welds using methods and welding materials, as specified in ASME

B31.1, AWS D1.1/D1.1M and MNS ISO 9956-2:2003 Technical requirements for metal welding and approvals.

- C. Centralizers (“guides” or “spacers”) welded to the well casing shall be Type 304 stainless steel.
- D. The Contractor shall submit for approval product data and the name of the supplier for the proposed stainless steel well-casing and couplings in the Well Installation Plan within 14 days of receipt of the Notice to Proceed.

2.05 STAINLESS-STEEL WELL SCREEN, SCREEN PLATE, CENTRALIZERS AND PEDESTAL:

- A. Well screen shall be 450-mm diameter, Type 304 stainless steel of the continuous-slot, wire-wound design meeting the requirements of AWWA A100. Screen shall be fabricated by circumferentially wrapping a 4.8-mm, triangularly shaped wire around a circular array of internal rods. The wire configuration must produce inlet slots with sharp outer edges. The slots shall widen inward so as to minimize clogging. Each juncture between the horizontal wire and the vertical rods shall be fusion welded under water by the electrical resistance method. The screen length shall be determined through soil sampling.
- B. Well screen shall be selected so that the average entrance velocity does not exceed 0.03 meter per second (0.1 foot per second) at the design flow rate of 71 or 74 l/s.
- C. The Contractor’s Professional Hydrogeologist shall recommend a well-screen slot-size, to be reviewed and approved by the Engineer, based on the grain-size distribution curves of the native soils collected from the pilot boreholes, and in concert with selection of the manufactured glass-bead diameter. Refer to Design Drawings Sheet 0-C-301, Proposed Typical Well Design.
- D. The bottom plate of the well screen plate shall be Type 304 stainless steel, 6.4-mm thick continuously welded to the bottom of the well screen.
- E. A 450-mm (18-inch) diameter by 9.4-mm (0.375-inch) thick plate made of Type 304 stainless steel shall be welded below the screen plate to act as a “pedestal”.
- F. Perforated and louvered type well screens are not acceptable.
- G. All permanent well screens shall be joined by stainless-steel materials, specifically, factory-installed threaded couplings, double spline-lock couplings or full penetration welds using methods and welding materials, as specified in ASME B31.1, AWS D1.1/D1.1M and MNS ISO 9956-2:2003.
- H. Centralizers (“guides” or “spacers”) welded to the well screen shall be Type 304 stainless steel.
- I. The Contractor shall submit for approval product data and the name of the supplier for the proposed stainless steel well screens in the Well Installation Plan within 14 days of receipt of the Notice to Proceed.

## 2.06 ARTIFICIAL FILTER PACK – MANUFACTURED GLASS BEADS:

- A. Manufactured glass beads shall be spherical, acid-proof, polished, soda-lime glass beads, subject to the approval of the Engineer, meeting the following criteria:
  - 1. Hardness (according to Mohs Hardness Scale): > 6
  - 2. Sphericity: 0.94 to 0.98
  - 3. Compressive Resistance: > 1900 Newton
  - 4. Specific weight: 2.50 kg/liter
  - 5. Bulk Density: 1.43 to 1.53 kg/liter
  - 6. Melting Point: 1441 °C
  - 7. Composition (Approx. %): 65 – 75% SiO<sub>2</sub>; 12 – 17% Na<sub>2</sub>O; <10% CaO; <5% Al<sub>2</sub>O<sub>3</sub>; <5% MgO.
  - 8. Free of silica dust, silanes, glycol and epoxy.
- B. Manufactured glass beads shall be certified by NSF and be in compliance with NSF 61. Manufactured glass beads shall meet strict criteria for roundness, uniformity in size, smoothness, crushing strength and chemical resistance.
- C. The Contractor's Professional Hydrogeologist shall recommend a glass-bead diameter, to be reviewed and approved by the Engineer, based on the grain-size distribution curves of the native soils collected from the pilot boreholes, and in concert with selection of well-screen slot-size. Refer to Design Drawings Sheet 0-C-301, Proposed Typical Well Design detail.

## 2.07 TRANSITION PACK:

- A. A transition pack consisting of processed and graded sand shall be placed vertically between the well sealant and the artificial filter pack. The transition pack shall be sized to prevent invasion of well sealant into the filter pack.
- B. The grain-size of the transition pack shall be selected by the Contractor, subject to the approval of the Engineer.
- C. Transition pack shall also be used as backfill material that is placed: 1) at the bottom of the borehole before installation of the well materials, and 2) between blank well casing and fine-grained native soil layers, if found. (Refer to Paragraph 3.05 A, F and G, below regarding "fine-grained layers".)

## 2.08 WELL SEALANT:

- A. The annular space between the well casing and the borehole wall shall be sealed with cement grout or similar product, subject to the approval of the Engineer.



- B. Cement grout shall be mixed in a proportion of 19.7 liter (5.2 US gallons) of water per 42.6 kg (94 pounds) of portland cement conforming to ASTM C150/C150M. If bentonite is added to the grout, it shall be mixed in a proportion of 1.4 to 2.3 kg (3 to 5 pounds) of bentonite, 25 liters (6.5 US gallons) of water and 42.6 kg (94 pounds) of portland cement. Grout shall be mixed in accordance with the manufacturer's instructions.
- C. Alternatively, the well may be sealed with another product with prior approval by the Engineer, and mixed and installed according to the manufacturer's instructions.
- D. Water shall be clean as required for drinking.

## 2.09 CONDITION OF PRODUCTS:

- A. All products used to construct the wells, including well screens and casings, well sealants, and clean fill shall be new, clean, free of defects and shall arrive on site free from oil, grease, mud, soil, dust, residues and other potential contaminants. The Engineer will reject products that do not meet the above criteria, and order that they be replaced with products that do meet the criteria.

## PART 3 - EXECUTION

### 3.01 GENERAL:

- A. The following information and requirements, though not all-inclusive, are provided to assist the Contractor in the evaluation of the Work required to meet the project objectives.
- B. Drilling equipment shall be inspected, maintained and repaired in accordance with accepted industry practice.
- C. The Contractor shall disinfect all drilling equipment and materials prior to lowering equipment and materials into the well. A chlorine concentration of at least 50 parts per million (ppm) obtained by the addition of sodium hypochlorite will be used to disinfect equipment and materials.
- D. The Contractor shall furnish the materials, equipment, and labor necessary to install 625-mm (minimum) temporary steel surface-casing to a minimum depth of 6 meters and drill boreholes of minimum 600-mm diameter to a depth of at least 60 meters using rotary-drilling methods. Proposed well depths are provided in the table included in the Design Drawings Sheet 0-C-301. Actual depths shall be based on pilot borehole drilling results as approved by the Engineer. The drilling method and need for drilling additives will need to be considered by the Contractor and approved by the Engineer on a well-by-well basis.
- E. Specific tasks not completely described in this Section that are necessary or normally required as part of the Work described, or that are necessary or required to make the installation satisfactorily or legally operable, shall be performed by the Contractor as incidental work without extra cost. The expense of such work shall be included in the applicable unit prices for the Work described (SECTION 01025 MEASUREMENT AND PAYMENT).

- F. The Contractor shall be required to provide direct and reliable telephone service with the Engineer at all times during drilling, construction, and testing operations. Daily progress reports shall be communicated from the Project Hydrogeologists to the Engineer. The Contractor shall also provide a telephone list of individuals directly involved in the daily progression of Work.

### 3.02 EQUIPMENT FOR WATER-SUPPLY WELL CONSTRUCTION

- A. Provide standard, commercially available rotary-type drilling rig with required hook-load capacity and equipment capable of performing drilling operations in accordance with accepted industry practice.
- B. All equipment shall be in good working condition before drilling operations commence. Operate and maintain all equipment in conformance with manufacturer's specification. The Contractor shall submit information regarding the equipment and materials planned for use in this project before mobilization.
- C. The Contractor shall ensure that the hook load/weight capacity of the derrick and draw works meets the original manufacture's specifications or at a minimum 1.5 times the heaviest load anticipated to complete the Work.
- D. The Contractor shall be responsible for measuring (using industry standards) drilling parameters and drilling-fluid properties during the progression of Work. These parameters shall include; weight on bit (WOB), drill string weight, rate of penetration (ROP). Equipment shall be calibrated and certified by the manufacturer or appropriate testing facility before the start of drilling and shall be operational throughout drilling. Improper operation or lack of measured and recorded data is sufficient cause to suspend drilling, at Engineer's discretion.

### 3.03 PROTECTION OF EXISTING CONDITIONS:

- A. Maintain existing survey monuments and wells and protect them from damage from equipment and vehicular traffic. Repair any items damaged during this Work. Reinstall wells requiring replacement due to Contractor negligence according to these specifications.

### 3.04 DRILLING PREPARATION:

- A. Decontamination Before Mobilization:
  - 1. The Contractor shall clean all drilling, pumping equipment and all equipment and tools that enter the borehole before mobilizing to the site using high-pressure hot water/steam to remove residual oil and grease, mud, soil cuttings, residues and potential contaminants. The Engineer will inspect the drilling equipment upon its arrival at the Project Site, and if it is inadequately cleaned, the Engineer shall order that the equipment be removed from the site until the equipment is adequately cleaned.
- B. Staging of Well Installation and Construction Materials:
  - 1. During drilling and well installation operations, the Contractor shall stage all well materials, drilling tools and casings on wooden beams or a suitable

substitute, so the materials will not come in contact with the ground. Materials, tools and casings that come in contact with the ground shall be washed with high-pressure hot water/steam and then spray disinfected.

C. Disinfection During Construction:

1. The Contractor shall disinfect all drilling and pumping equipment that will come in contact with the native soils to minimize the potential for the introduction of bacteria into the aquifer. The Contractor shall mix sodium hypochlorite with clean water at a strength of 50 ppm to make a proper solution. The Contractor may apply the sodium hypochlorite solution using a spray canister or other suitable means. In addition, the Contractor shall periodically disinfect water used during the drilling process. All permanent construction materials, including well casings, and well screens shall also be disinfected on-site prior to installation to minimize the potential for introduction of bacteria. Engineer shall review and approve all proposed disinfection procedures in advance with Contractor.

D. Temporary Access Tracks and Drilling Platform:

1. The Contractor shall construct and maintain temporary access tracks and drilling platforms using approved sand, gravel, heavy rubber matting, wooden timbers or wooden planks to support the drilling rig and support vehicles, as necessary. The ground surface at the well locations may be soft and may not be capable of supporting this equipment during rainy conditions and whenever the temperatures are above freezing. The drilling platforms shall be sized to accommodate the drilling rig, support vehicles, equipment and construction materials but not exceed 400 square meters. Drilling platforms shall be sized to allow the Contractor to execute the work efficiently, while at the same time protecting the integrity of the Work and the health and safety of workers. The temporary access tracks and drilling platforms, including their dimensions, are subject to the approval of the Engineer.
2. Temporary access tracks shall be coordinated with the CP-3 Contractor (Conveyance). To the extent feasible and practical, temporary access tracks shall be constructed along the alignment of the permanent access tracks. The CP-3 Contractor shall be responsible for constructing stream crossings within the permanent access tracks needed by the CP-1 Contractor to access well-drilling sites.

E. Water Source:

1. Well drilling and well construction requires the use of water. See Paragraph 1.16 above for sources of water supply. The Contractor shall provide pumps and all necessary equipment to obtain water.

3.05 PILOT BOREHOLES:

A. Purpose of Pilot Boreholes:

The Hydrogeologic Investigation Program conducted in 2019 involved the installation

of test wells and observation wells at all 30 of the proposed well sites in the Biokombinat and Shuvuun well fields. Based on the hydrogeologic information collected in 2019, the aquifer at each of the proposed well fields appears to consist largely of fine-to-coarse sands, fine-to-coarse gravel and cobbles, in varying proportions. However, fine-grained layers (i.e., fine sand, silt and clay) were also identified, and though they appear generally to be a minor stratigraphic component, their presence must be accounted for in the final design of the production wells.

The main goal of installing pilot boreholes is to identify the presence, depth, composition and thickness of fine-grained layers, so that the finished production wells:

- 1) can be properly designed by experienced water-well professionals, and,
- 2) will pump clear water that is free of sand and turbidity, once the wells are properly constructed and fully developed.

The records of the 2019 Hydrogeologic Investigation Program included herein (Attachment 3), are provided to the Contractor for informational purposes only and should not be relied upon for final design purposes. Furthermore, the typical well design presented in these specifications is intended to be a guideline. Final well designs shall be based on actual stratigraphic conditions observed through the pilot-borehole investigations.

B. Pilot Boreholes – General Approach:

1. A pilot borehole of 152-mm (6-inch) to 203 mm (8-inch) diameter shall be advanced from the ground surface to the target depth at each proposed well location for the dual purpose of collecting soil samples and conducting borehole geophysical surveys. Soil descriptions, soil-sample photos, soil grain-size analysis and geophysical testing results shall be used in the final design of the wells, i.e., well-screen slot-size, artificial filter-pack size, well-screen depth interval(s) and blank-casing depth interval(s).
2. Pilot boreholes shall be advanced with temporary steel casing and air-rotary drilling techniques. Drilling mud will not be allowed. Engineer will consider other methods that ensure that: 1) representative soil samples can be collected, and 2) borehole geophysical surveys can be properly conducted. The Contractor shall maintain the vertical plumb of the pilot borehole as it is being advanced.
3. Soil samples shall be obtained continuously from ground surface to the target depth of the proposed well at one (1) meter intervals. To this end, Contractor shall provide a means of separating the compressed air from the soils, so that the air discharges upward into the atmosphere and representative one-meter soil samples drop into buckets, tubs or other containers placed on the ground, with a minimum loss of fine-grained soils. Soil samples shall then be placed on heavy-duty sheet plastic at consecutive depths and labeled to display the Well ID, the date of sample collection and depth interval of the soil sample, and then photographed.
4. Contractor shall keep track of drilling depth by marking the outside of the

temporary steel casing in 0.5-meter increments with chalk, heavy crayon, soapstone or other durable marker visible to a viewer from a distance of 15 meters.

5. An English-speaking hydrogeologist experienced in designing water-wells constructed in granular, unconsolidated aquifers shall supervise all aspects of the pilot borehole process, including the collection and logging of soils in the field and the borehole geophysical surveys.
6. Upon completion of the pilot borehole and all related Work, the temporary well casing shall be disinfected with a sodium hypochlorite solution with a strength of not less than 50 mg/L, and then removed.

#### C. Geologic Logs:

Written descriptions of the soils shall be documented in one (1) meter intervals on a Geologic Log Form. Field description and identification of soils shall be done in accordance with ASTM D2488 - 17e1. The Geologic Log shall include the following information:

1. Name of Project
2. Well ID and Date(s) of Pilot Borehole Drilling
3. Well Drilling Firm and Contact Information
4. Name and Contact Information of Site Hydrogeologist
5. Name and Contact Information of Supervising Hydrogeologist
6. Total Depth, Casing Diameter and Static Water Level (below ground surface)
7. Soil Descriptions, as follows:
  - Sample color;
  - Angularity/Roundness (very angular, angular, sub-angular, sub-rounded, rounded, well rounded);
  - Sorting (very well sorted, well sorted, moderately sorted, poorly sorted), where “very well sorted” denotes uniform soil grain-size, and “poorly sorted” denotes non-uniform grain-size;
  - Grain-size, where the following apply:
    - Fines, less than 0.074-mm (0.003-inch) diameter, passing the No. 200 sieve;
    - Fine sand, 0.074- to 0.42-mm (0.003- to 0.02-inch) diameter, retained on the No. 200 sieve and passing the No. 40 sieve;
    - Medium sand, 0.42- to 2-mm (0.02- to 0.08-inch) diameter, retained on the No. 40 sieve and passing the No. 10 sieve;
    - Coarse sand, 2- to 4.75-mm (0.08- to 0.190-inch) diameter, retained on the No. 10 sieve and passing the No. 4 sieve;
    - Fine gravel, 4.75- to 19-mm (0.190 to ¾-inch) diameter, retained on the No. 4 sieve;
    - Coarse gravel, 19- to 76-mm (¾- to 3-inch) diameter;
    - Cobble, 76- to 305-mm (3- to 12-inch) diameter.
    - The proportion of fines, fine sand, medium sand, coarse sand (or fine-to-coarse sand, fine-to-medium sand, medium-to-coarse sand), fine gravel, coarse gravel (or fine-to-coarse gravel) and cobbles shall be approximated in percent, or a range of percent (e.g., “fine-to-coarse sand, 50 to 60%; fine

gravel, 35% to 40%; <5% fines”).

A sample Geologic Log Form is shown in Attachment 4.

#### D. Soil Samples

1. Representative samples of the natural soil formations shall be collected at one-meter intervals for the entire depth of the pilot borehole. Contractor shall collect two (2) sets of soil samples: one (1) for Contractor's use, and one (1) for the Engineer. Samples shall be collected in 10- by 17-inch poly/cotton soil sample bags, 2-gallon resealable zip lock bags, or another suitable container that will not be subject to damage and loss of sample. The bags or containers shall be labeled in permanent indelible ink and photographed for future reference. Labeling shall include Well ID, date, and depth range. Sample bags or containers shall be placed in partitioned boxes. Boxes shall be labeled with project number and well number. Containers and boxes shall be furnished by the Contractor. The soil samples shall then be subjected to grain-size analysis.

#### E. Grain-Size Analysis:

1. Each one-meter soil sample collected from the pilot boreholes shall be subjected to grain-size analysis in accordance with ASTM C136/C136M, with the finest sieve being 0.074-mm (0.003-inch) No. 200 mesh. The Contractor shall provide a grain-size analysis report with summary sieve analysis data sheets and grain-size distribution curves. The grain-size distribution curves shall be displayed on graphs showing cumulative percent retained versus grain size in inches and mm. The grain-size analysis report shall identify numerically the 10%, 50%, and 60% grain-sizes ( $D_{10}$ ,  $D_{50}$  and  $D_{60}$ ) and the uniformity coefficient,  $C_u$ . Grain-size distribution curves shall be submitted to the Engineer for review with the Proposed Well Construction Diagram for each well.
2. Laboratory classification of soils shall be done in accordance with ASTM D2487 – 17 and MNS 2306:1986.
3. The Contractor shall not discount the volume of coarse soil material (19 mm diameter and greater) but instead shall accurately report the coarse fraction as a percentage of the overall sample. This information will be considered at least qualitatively in the selection of the artificial filter pack and slot size of the well screen.
4. A sample Grain-Size distribution curve is shown Attachment 4.

#### F. Borehole Geophysical Surveys:

1. The primary goal of borehole geophysical surveying is to identify the presence, composition, depth and thickness of fine-grained layers (clay, silt, silty fine sand and fine sand) that may occur at each proposed well location. These fine-grained layers must be accounted for in the design of the permanent well (filter pack, well casing and screen) to prevent fines from entering the permanent well, once it is constructed and fully developed.

2. Once the pilot borehole has reached the target depth, the Contractor shall log the pilot borehole using the following borehole geophysical logging techniques:
  - Natural gamma radiation, in American Petroleum Institute (API) units
  - Gamma-gamma, in units of density
  - Caliper, in millimeter (if the pilot borehole is not cased)
  - Temperature, in degrees Celsius
3. Additional logging techniques may be used at the Contractor's discretion, but the listed techniques should be considered a minimal suite of tools to be used to fulfill the borehole logging objectives. All geophysical logging should be conducted using appropriate quality assurance/quality control (QA/QC) techniques. A QA/QC plan shall be drafted which covers appropriate calibration procedures/dates for each sensor/tool, depth control, and data quality checks. Borehole data shall be collected according to best practices based on ASTM recommendations (or equivalent). In general, borehole geophysical logging shall be run at a rate of no more than 3 meters per minute (10 feet per minute). The rate shall be uniform throughout individual boreholes and from borehole to borehole.
4. The geophysical records shall be processed and presented using conventional software available in the industry, such as ALOG or WellCAD. The results of the borehole geophysical logging shall be displayed graphically, with a depth scale on the far left and the four logging records displayed side-by-side to the right. An example of a suitable graphical, geophysical report is shown in Attachment 4. The borehole geophysical records shall be interpreted by an experienced geophysicist and the logs shall be annotated to indicate the composition, depth and thickness of fine-grained layers. Geologic observations and grain size analyses should be included on each log to aid in correlating geophysical data responses to other observations.

#### G. Proposed Final Well Design Report/Well-Construction Diagram

1. Within 21 days after completion of each pilot borehole, the Contractor shall submit to the Engineer for review and approval, a Proposed Final Well Design Report/Well Construction Diagram for each permanent well. The diagram shall be a profile, having a vertical scale showing the following:
  - The diameter and depth of the borehole, proposed well-screen interval and slot-size, proposed well-casing interval(s), proposed filter-pack interval and size (diameter), proposed transition pack interval and proposed well seal interval.
  - A detailed Geologic Log describing soils extending from the top of the borehole to the bottom of the borehole, including the 50% grain size ( $D_{50}$ ) and the uniformity coefficient,  $C_u$ .
  - Calculations related to the selection of the manufactured glass bead diameter and well-screen slot-size.
  - Special note of any fine-grained layers identified from the pilot boreholes, and special considerations for the installation of blank well casing and a fine-grained filter pack that will prevent entry of the fine-grained soils into the permanent well.



- Static water level, date of measurement, and measurement reference (top of casing and ground surface).
- 2. The Contractor shall submit at a minimum the Geologic Logs, Grain-size distribution curves, Daily Activities Logs, photographs and the report of the Borehole Geophysical surveys with each Proposed Final Well Design Report/ Well-Construction Diagram.
- 3. In addition, the Contractor shall submit a Well Screen Submittal for the selected well screen indicating the material of construction, strength, slot size, open area per meter (or foot) of screen, and transmitting capacity per meter (or foot) of screen at an entrance velocity of 0.1 feet per second.

### 3.06 PERMANENT WATER-SUPPLY WELL CONSTRUCTION:

- A. The drilling method shall conform to all industry standards for water-well construction. The drilling method shall prevent the collapse of formation material against the well screen and casing during installation of the well. The inside diameter of any temporary casing shall be sufficient to allow proper placement of the permanent well screen, well casing, centralizer(s), filter pack, and seal. Grease or oil on drill rods, casing, or auger joints are not permitted; however, PTFE tape or vegetable oil (in solid phase form) are acceptable. The drill rig shall be free from leaks of fuel, hydraulic fluid, and oil which may contaminate the borehole, ground surface or drill tools. Well casing, well screen, and joint couplings shall be of compatible materials throughout each well. The well shall be an artificial filter-pack well installed in unconsolidated soils. The well shall be drilled straight, vertically plumb, and circular from top to bottom. During construction of the wells, precautions shall be used to prevent tampering with the well or entrance of foreign material. Surface-water runoff shall be prevented from entering the well during construction.
- B. The Contractor shall ensure the integrity of the final boreholes at all times to prevent damage or contamination. If there is an interruption in work, such as overnight shutdown or inclement weather, the well opening shall be closed with a watertight uncontaminated cover. The cover shall be secured in place or weighted down so that it cannot be removed except with the aid of the drilling equipment or through the use of drill tools.
- C. The Owner shall be given a one (1) week notice with a schedule of activities prior to initial mobilization. All drilling activities can be performed during normal working hours (24 hours per day, 7 days per week).
- D. Drilling Methods:
  - 1. Drilling shall be done using rotary-drilling methods acceptable to the Engineer. Drilling fluids and/or temporary casings shall be introduced into the borehole to maintain borehole stability. If mud-rotary drilling methods are employed, the Contractor shall mix and recirculate drilling fluids in mud tubs (sedimentation tanks). Use of mud pits must be approved by Engineer.
- E. Drilling Fluids (applies to mud-rotary drilling method, if employed):

1. The drilling fluids and need for drilling additives shall be described in the Drilling Fluids Plan, subject to review by the Engineer prior to drilling. The Contractor shall use only drilling fluids and additives specifically recommended by the manufacturer for use in water-well drilling operations. Mechanical removal of solids from the drilling fluid is necessary to reduce the build-up of a thick fluid (over-balanced) and formation damage due to high fluid invasion.
2. The Contractor's Drilling Fluids Engineer shall monitor the drilling fluid system continually in accordance with the Drilling Fluids Plan to assure that the fluid properties meet the specifications. This monitoring shall be done during the drilling of the 600-mm diameter boreholes, and during well construction, if necessary.
3. The Contractor shall provide all drilling fluid additives and lost circulation material, as required. The Contractor shall review drilling fluids and potential additives, itemize all products, and include the appropriate safety data sheets (SDS) to be used during the course of drilling operations. The Contractor shall submit these items in the Drilling Fluids Plan. Additives for drilling are only to be used on a well-by-well basis to address specific issues.
4. The Contractor shall provide an adequate and safe water supply for mixing operations. Refer to Paragraph 1.16, WATER SUPPLY FOR CONSTRUCTION PURPOSES, above.
5. The Contractor shall use drilling fluids with suitable additives to ensure rapid breakdown during well construction and development. Full technical details of any drilling medium or additives shall be included in the Drilling Fluids Plan.
6. The record of those observations and any other relevant details shall be delivered to the Engineer.
7. The costs of materials required to maintain the drilling fluid in a satisfactory condition shall be borne by the Contractor and shall be deemed to be included in the contract rates for drilling.

F. Daily Activities Logs:

1. The Contractor shall maintain a detailed daily log of his activities during the construction of the well on a Daily Activities Log form acceptable to the Engineer. Each daily log shall commence at the beginning of each change in shift or at each change in drillers. The log shall provide a brief and accurate record along with the time (hour of the day) of the following: generalized geologic materials and depths encountered, type of drilling, depths of lost circulation zone(s) and methods of regaining circulation, drilling rate, time, depth, description of any unusual occurrences or problems during drilling, complete record of drilling fluids added, cementing operations, repair time, depth of water table, water pressure changes while drilling, dimensions of well materials installed, and any other Work performed at the site. The Contractor shall keep the log up to date with the progress of drilling. Failure to keep this record up-to-date shall be grounds for the Engineer to stop drilling operations.

2. The Contractor must submit copies of Daily Activities Log to the Engineer on a weekly basis.

G. Borehole for Well Construction:

1. A temporary steel surface-casing of 625-mm (minimum) in diameter shall be installed from the ground surface to a minimum depth of six (6) meters. The well casing shall stand 0.5-meter above ground to prevent surface water from entering the borehole.
2. The borehole diameter from a depth of 6 to 60 meter shall be 600-mm in diameter or greater. If additional temporary well casings are proposed, these proposed casing diameters and depths shall be proposed in the Well Installation Plan and reviewed by the Engineer, prior to mobilizing to the site.
3. The Contractor shall maintain the vertical plumb of the borehole. See Paragraph 3.06 H, below, for plumbness methods and criteria.
4. Contractor shall keep track of drilling depth by marking the outside of the drilling rod in 0.5-meter increments with chalk, heavy crayon, soapstone or other durable marker visible to a viewer from a distance of 15 meters. Contractor shall maintain a tally sheet of drilling rod lengths being used for each location and each drill string.
5. Similarly, during well construction, the Contractor shall keep track of depth by marking the outside of all well screen and casing during installation. Contractor shall take frequent measurements of the depth of artificial filter pack, transition pack and well seal during their installation. Contractor shall maintain a tally sheet of well screen and well casing lengths being installed at each location. In addition, Contractor shall maintain tally sheets summarizing the material depths and volumes used for the artificial filter pack, transition pack and well seal.
6. Well-drilling equipment shall remain on site at all times during the drilling of the borehole.

H. Well Construction - Plumbness and Alignment Testing:

1. Boreholes shall be drilled round, straight, and plumb throughout. The Contractor shall perform plumbness and alignment tests of the borehole (if temporary casing is used) and finished well. Each well must meet the plumbness and alignment criteria prior to final acceptance.
2. The plumbness and alignment testing shall be performed in accordance with AWWA A100, Appendix D (Plumbness and Alignment – Procedure for Testing). AWWA A100 Appendix D shall be the governing standard for acceptance of the wells regarding plumbness and alignment.
3. The borehole shall not deviate more than 25 cm per 50 meters (10 inches per 164 feet) for its entire depth. If the test indicates that the borehole does not meet the plumbness criterion, appropriate corrective action shall be taken by the Contractor at Contractor's expense.

4. See also Paragraph 3.06 J, Permanent Well Casing, below.

I. Well Screen:

1. Once the borehole is complete, sections of 450-mm diameter well screen shall be joined together, then joined to the bottom of the 450-mm diameter stainless steel well casing and lowered into the well. The entire well screen assembly shall include the screen, a stainless steel bottom plate and the stainless steel pedestal welded to the bottom plate.
2. Sections of well screen shall be joined using factory-installed threaded couplings, double spline couplings or welding.
3. Stainless steel guides (“centralizers”) of the appropriate diameter shall be welded to the bottom and top of the well screen to center the well screen in the borehole. Additional guides shall be spaced no more than 10 vertical meters apart, unless field conditions dictate otherwise.
4. Based on the limited grain-size analyses performed during the 2019 Hydrogeologic Investigation, 80-slot well screens may be an adequate design for most of the soils encountered. However, final selection of well screen slot-size is subject to confirmation through pilot-borehole drilling and grain-size analyses. Grain-size distribution curves completed during the 2019 Hydrogeological Investigation are included in Attachment 5.
5. Where fine-grained layers are encountered, blank well casing may be necessary, instead of well screen.

J. Permanent Well Casing:

1. The top of the permanent 450-mm diameter well casing shall extend approximately 1 meter above ground (or as directed by the Engineer).
2. Permanent casing shall be joined together by means of factory-installed threaded couplings, spline-lock couplings, or full penetration welds, using methods and welding materials as specified in ASME B31.1, AWS D1.1/D1.1M and MNS ISO 9956-2:2003.
3. Stainless steel guides (“centralizers”) of the appropriate diameter shall be welded to the outside of the well casing to center the casing in the borehole and within temporary casings. The guides shall be spaced no more than 10 vertical meters apart, unless field conditions dictate otherwise.
4. The Contractor shall be responsible for maintaining vertical plumb throughout the construction of each well. Permanent well casing(s) shall not deflect from a vertical plumb line more than 25 cm per 50 meters (10 inches per 164 feet) for its entire depth.
5. The Contractor shall measure the plumbness of the permanent 450-mm diameter well casing when it is first installed (before installation of the artificial filter pack), before the well seal is installed, after the seal is installed,

and whenever requested by Engineer. The Engineer shall be present at all times when a well is being measured for plumbness.

6. Alignment of the well casing shall be tested by lowering a plumb of 6 meters (20 feet) in length. The outer diameter of the plumb shall not be more than 13 mm (1/2-inch) smaller than the inside diameter of the well casing. If the plumb fails to move freely throughout the entire length of the casing, the alignment shall be corrected. If the faulty alignment is not correctable, as determined by the Engineer, the well shall be properly abandoned and a new well drilled at no additional cost to the Owner.

#### K. Artificial Filter Pack

1. Contractor shall install approximately 0.15 to 0.3 meters of processed sand at the bottom of the borehole, and place the well assembly (casing, screen and pedestal) on the processed sand before introducing the artificial filter pack. The well screen pedestal shall rest on the processed sand.
2. Contractor shall place manufactured glass beads in the annulus between the well screen/casing and the borehole wall. The artificial filter pack shall be installed in the annulus until the top of the pack is at least 1 meter above the bottom of the temporary well casing. The artificial filter pack will likely settle during development and the Contractor should maintain the top of the pack a minimum of 1 meter above the bottom of the temporary casing. Maintaining the filter pack inside the temporary casing is to help prevent the formation from collapsing into the annulus and potentially reaching the well screen. Upon completion of well development, a minimum of 7 meters of artificial pack should remain above the top of the well screen.
3. Engineer shall select the size (diameter) of the manufactured glass beads based on the formation grain-size distribution. The bead size normally selected ranges from 5- to 10-times the 50% grain size ( $D_{50}$ ) of the formation.
4. The diameter of the manufactured glass beads shall be at least 30% larger than the well-screen slot size. Therefore, the screen shall retain 100% of the manufactured glass beads.
5. Based on the limited grain-size analyses performed during the 2019 Hydrogeologic Investigation, a 5- to 6-mm diameter glass bead may be adequate for most of the aquifer formation at each proposed well location. However, where fine-grained layers are encountered, a finer-grained filter pack, made of processed sand, may be necessary. However, final selection of artificial filter pack is subject to confirmation through pilot-borehole drilling and grain-size analyses. Grain-size distribution curves completed during the 2019 Hydrogeological Investigation are included in Attachment 5.
6. Contractor shall place a transition pack of one meter in thickness above the glass beads before installation of the cement-grout (sanitary) well seal. Two layers of transition pack of different grain size will be necessary to make the proper transition and prevent the cement-grout seal from intruding into the

glass-bead filter pack. Bentonite pellets may also be used as transition material with the approval of the Engineer.

7. Well development may cause settlement of the manufactured glass beads. Unless otherwise directed by the Engineer, the transition pack shall be installed after the well has been fully developed to avoid collapse of the transition pack.

L. Cement-Grout (Sanitary) Well Seal

1. The annular space between the 450-mm diameter permanent well casing and the borehole wall shall be sealed with a well sealant as specified. Acceptable grouting methods are detailed in AWWA A100. The bottom of the seal shall rest on top of the transition pack, as shown on the Typical Proposed Water-Supply Well diagram. Well sealant shall be installed by pumping through a 5 cm (2-inch) diameter tremie pipe that extends from the ground surface to the top of the transition pack to lift all the drilling fluids and/or groundwater from inside the borehole. The top of the well seal shall be at ground level.
2. The tremie pipe shall be thoroughly cleaned with high pressure hot water/steam before use in each well. The bottom of the tremie pipe shall be constructed to direct the discharge to the sides rather than downward. The discharge end of the tremie pipe shall be submerged at all times. Work shall not be conducted in the well within 24 hours after cement grouting.
3. Well development may cause settlement of the manufactured glass beads. Unless otherwise directed by the Engineer, the well seal shall be installed after the well has been fully developed to avoid the creation of a void beneath the well seal.

M. Elevation and Location Survey

1. At the conclusion of well construction, the Contractor shall perform a land survey at each well location to determine the finished elevations of the ground surface and well casing, which will be used to compute elevations of the top and bottom of well screen, top and bottom of well seal, top and bottom of transition pack, top and bottom of artificial filter pack, bottom of well and static water level.
2. The elevation reference shall be meters above sea level (DSM). Locations shall be determined in latitude and longitude and UTM coordinates.
3. Elevation and location information shall be entered onto As-Built Drawing. (see Section 02672, Paragraph 3.12 F.)

N. Final Report/Well-Construction As-Built Drawing

1. Within 7 days after completion of each production well, the Contractor shall submit to the Engineer for review and approval, a Final Report/Well Construction As-Built Drawing for each permanent well. The final report shall

include as a minimum, an as-built drawing, plumbness and alignment testing records, well-development records, pumping-test records, final sand and turbidity test results, pumping-test water-quality reports, final well disinfection test results, video inspections, daily activities logs, project photographs and drone surveys, and final well coordinates and elevations of constructed well components

2. The as-built drawing shall be a profile, having a vertical scale showing the following:
  - The diameter and depth of the well, well-screen and slot-size interval(s), well-casing interval, filter-pack and size (diameter) interval(s), transition pack interval and well seal interval.
  - A detailed Geologic Log describing soils extending from the top of the borehole to the bottom of the borehole, including the 50% grain size (D50) and the uniformity coefficient, Cu.
  - Calculations related to the selection of the manufactured glass bead diameter and well-screen slot-size.
  - Special note of any fine-grained layers identified from the pilot boreholes, and special considerations for the installation of blank well casing and a fine-grained filter pack that will prevent entry of the fine-grained soils into the permanent well.
  - Static water level, date of measurement, and measurement reference (top of casing and ground surface).
3. The Contractor shall also include the Geologic Logs, Grain-size distribution curves, photographs, and the report of the Borehole Geophysical surveys submitted with the Proposed Final Well Design Report/Well-Construction Diagram for the respective well site.

### 3.07 WELL DEVELOPMENT:

- A. Each well shall be developed as detailed in the Well Installation Plan. Development equipment shall be of an approved type and of sufficient capacity to remove all drilling and cutting fluids, clay, silt, sand, rock cuttings, and any other foreign material. Contractor shall also refer to the latest version of AWWA A100 regarding well development.
- B. The overall goals of well development are two-fold: to maximize well efficiency (specific capacity) and to remove formation soils and drilling fluids, so that the well pumps clear water that is free of sand turbidity.
- C. Before well development commences, Contractor shall measure and record the volume of sand accumulated at the bottom of the well during installation of the well casing, well screen and filter pack.
- D. Development shall be performed primarily by cycles of pumping-and-surgings using surge blocks. Pumping shall be achieved with the use of airlifting, submersible pumps, turbine pumps or centrifugal pumps. Because the static water level is expected to be relatively shallow at each location, i.e., within 1 to 3 meters of the ground surface, pumping by suction lift may be a feasible approach.



E. Development by Airlifting:

1. If appropriate and as dictated by field conditions, the Contractor shall develop the well by pumping by air-lifting using an airline inside an eductor (suction) pipe, in accordance with the accepted Well Installation Plan. The Contractor shall furnish, install, and operate an air compressor with sufficient capacity to exceed the maximum head pressure in the well. Airlifting shall begin at the uppermost portion of the open well and proceed downward to the bottom. Upon reaching the bottom of the well, airlifting shall continue from that point until all debris is removed from the bottom of the well and the water is clear to the unaided eye or until such time that the Engineer deems the process to be complete.
2. The discharge water shall be discharged to a low lying area near the well site, subject to the review of the Engineer. The Contractor shall be responsible for providing and maintaining all necessary pipe, pumps and equipment connections, electrical controls, valves, containers and/or chemicals required for neutralization prior to discharge and any other items required to discharge water to the appropriate location.
3. Development by direct-air (by applying compressed air without an educator pipe) shall not be allowed, as it could introduce contaminants into the well.

F. Development by Pumping-and-Surging:

1. After the Engineer confirms that air-lift development is complete, the Contractor shall commence well development by pumping and surging, in accordance with the accepted Well Installation Plan.
2. The Contractor shall provide and install pumping equipment capable of continuously pumping at a range of flow rates up to 120 l/s.
3. Three surge blocks, spaced one- to two-meters apart vertically, shall be fastened to the pump column and inserted into the well screen. The entire length of well screen shall be developed in two- to three-meter sections. Development may begin at the top of the well screen or at the bottom of the well screen. However, by the end of development, the entire length of screen shall be developed by pumping-and-surging.
4. The initial surging motion shall be gentle to observe how the well reacts. If necessary, the Contractor shall experiment with the stroke height and stroke rate (strokes per minute) to optimize the well development process.
5. The initial pumping rate shall be gradually increased until the maximum rate of 110 liter per second is achieved. Development shall consist of pumping and surging the well, interrupted by a sequence of non-pumping periods (surging only) and non-surging periods (pumping only).
6. The Contractor shall take regular measurements of well yield and water levels in the well to track improvements in specific capacity. Water levels will be measured in “meters and centimeters below measuring point”. Contractor and

Engineer shall agree upon one reference level for all water-level measurements before start of the Work.

7. The flow rate shall be measured using an approved orifice weir, capable of accuracy of 3% or better, or V-notch weir placed at the end of the temporary discharge line about 100 meters from the well. Contractor may use a calibrated magnetic flow meter in addition to the weir. Debris that accumulates behind the orifice weir shall be cleaned periodically to maintain accurate flow readings.
  8. The Contractor shall maintain a record of well development in accordance with Section 02672, Paragraph 3.12 G, Well Development Records.
- G. Sand and turbidity removed from the well during development shall be containerized in a plastic or metal tub with a minimum volume of 2,300 liters (600 gallons). Containerizing sand and turbidity is essential to measuring and tracking the daily volume of sand/turbidity production, as well as protecting the environment.
- H. Well development shall continue until there is no increase in specific capacity and the water is free of drilling fluids, sand, silt and turbidity when pumping at 110 l/s. Well water shall be clear to the unaided eye and turbidity levels shall be less than or equal to 1 NTU. Sand content shall not exceed 2 ppm at a pumping rate of 110 l/s as measured with a Rossum Sand Tester after one hour of continuous pumping.
- 3.08 PERFORMANCE PUMPING TESTS:
- A. Pumping Tests:
1. Pumping Test Procedures:
    - a. The Contractor shall furnish all labor, tools, materials and equipment; and perform all operations in connection with the performance testing of each newly installed water-supply well, which includes, but is not limited to providing and subsequently removing a temporary pumping unit with check valve(s); a temporary power supply(s) capable of powering all equipment simultaneously; stilling well; discharge pipeline; flow measurement equipment; water-sampling equipment; labor and materials for continuous monitoring of pumping equipment during performance testing; and for reading and recording drawdown and recovery water levels during and after the continuous pumping tests.
    - b. Upon completion of the permanent water-supply wells, the Contractor shall conduct a performance pumping test of each permanent well for a period of 24 hours, as specified, when approved by the Engineer. The permanent wells shall be pumped at the Design Rate, and/or as directed by the Engineer. (For water-supply wells at Biokombinat, the Design Rate is 71 l/s; for those at Shuvuun, the Design Rate is 74 l/s.)
    - c. The Contractor's pumping equipment, including the submersible pump with check valve, the discharge piping, stilling well and any other equipment that enters the wells, shall arrive on site free of oil, grease,

soil, residues and other contaminants. Any equipment that arrives on site that is not clean shall be removed from the site immediately and properly cleaned.

- d. The Contractor shall test his pumping equipment 24 hours prior to the commencement of each performance test to ensure that the pumping equipment is properly functioning, that pump output is satisfactory, that sampling taps are properly functioning and suitable to the Engineer, that the temporary discharge piping is free of significant leaks, that the check valve works properly, and that flow measurement equipment is measuring the flow correctly. The Contractor shall correct any defects observed. The Engineer will not authorize the commencement of any performance test until all defects have been corrected.
- e. Prior to installing the test pumping equipment, the Contractor shall disinfect the permanent water-supply wells and pumping unit with a sodium hypochlorite solution that will result in a chlorine level of 50 ppm for the full length of the well. At the end of the performance test, a sample of the water shall be taken and delivered to a certified laboratory for bacteriological analysis. In the event that bacteria is detected, the Contractor shall re-chlorinate and analyze samples as many times as is necessary to obtain negative bacteria results, at no additional cost to Owner.
- f. During each performance test, the Contractor shall keep pumping test records of the pumping rates, weather conditions, rainfall, drawdown and recovery in the permanent well and all observation wells selected by the Engineer during the respective pumping and recovery periods. All water-level readings shall be measured electronically using data logging pressure transducers and manually using electronic probes, and recorded to the nearest hundredth of a meter (measuring tapes are to read directly in meter, tenths and hundredths of a meter). In addition to the actual time of each water level reading, the Contractor shall record the number of minutes that have elapsed from the start of a test. Water level readings shall be taken according to the following timetable:
  - (1) Prior to startup of test (static water level)
  - (2) After 30 seconds
  - (3) One minute to 10 minutes: once every minute
  - (4) Ten minutes to 100 minutes: once every 10 minutes
  - (5) One hundred minutes to 4 hours: once every 30 minutes
  - (6) Four hours to 12 hours: once every hour
  - (7) Twelve hours to shut down: once every 2 hours
  - (8) Prior to shutdown of test.

- g. At the beginning of each performance test and during each two (2) hour reading, the Contractor shall measure and record the flow of water in liters per second.
- h. After the pump is shut off, the Contractor shall measure water-level recovery at the same frequency as specified above for the pumping phase.
- i. For the start of any performance test (first 100 minutes) and shutdown (first 100 minutes), the Contractor shall provide two (2) qualified individuals to measure and record the water level in the pumping well and one other well selected by Engineer.
- j. In consideration of laboratory holding-times, performance tests shall be initiated on a Sunday, Monday, Tuesday, Wednesday, or Thursday only, as approved by Engineer. No drilling, development or pumping of other nearby wells shall be permitted 24 hours prior to, during, or 24 hours after the pumping test unless authorized by the Engineer.
- k. At the conclusion of each pumping test, a 450-mm diameter stainless steel cap shall be welded over the top of the well casing for protection.

2. Pumping Equipment:

- a. Pumps and motors used for performance testing shall be of good quality, reliable and capable of pumping continuously throughout the test period except for necessary interruptions for adjustments that may be required. Said interruptions shall not exceed one-half (1/2) hour at any one time or more than 3% of the entire time from the beginning of a test to the end. There shall be no shutdowns in the first 2 hours or last 30 minutes of the test. If shutdowns or interruptions due to any cause exceed the specified limits, and a test is declared to be a failure by Engineer, the Contractor shall start a new performance test without receiving compensation for the test declared to be a failure. Performance testing shall not commence until such time as approved by Engineer.
- b. Electrical generators used to power the pumps shall be of good quality, reliable and capable of generating power continuously. Generators shall be equipped with a noise reduction system and secondary containment for fuel as specified and approved by Engineer. In addition, the Contractor shall place heavy duty sheet plastic, properly bermed, beneath each electrical generator to provide additional secondary containment of fuel, subject to the approval of Engineer.

3. Discharge Pipeline and Flow Measurement:

- a. The Contractor shall provide a temporary discharge pipeline, approximately 300 meter in length, to extend from the well being pumped to a discharge point approved by the Engineer.

- b. The discharge line shall be properly sized to carry a flow of up to 120 l/s to the point of discharge. It is the intent of Engineer to have the water discharged at a point where it will not flow through the ground and back into the well being pumped and influence the drawdown readings of the well being tested.
  - c. The pumping rate shall be measured using a properly calibrated magnetic flow meter capable of measuring flow rates of at least 120 l/s. A calibration record will be required to demonstrate the flow meter accuracy is within 3% of better of the actual discharge. The flow meter shall be placed within 15 meters of the well.
  - d. In addition, the pumping rate shall be measured using an approved, properly sized and properly assembled orifice weir or V-notch weir placed at the end of the discharge pipeline. If an orifice weir is used, it shall have a rigid 32-mm diameter plastic sight glass and appurtenances, to measure the head on the orifice so that the pumping rate may be accurately computed. The rigid sight glass shall have the proper fittings so that it is in the vertical position at all times. A rigid measuring tape or ruler shall be permanently attached to the sight glass.
  - e. The Contractor shall provide a gate valve within 10 meters of the well to allow for adjustments to the pumping rate. A water sampling apparatus shall be provided at the wellhead of each well. The apparatus shall be made of steel, stainless steel and/or PVC. Brass fixtures, including "lead free brass" shall not be allowed. The apparatus shall have a "tee" and two separate sampling taps, each with a valve. One sampling tap shall be a smooth-nosed stainless steel faucet to be used for collecting samples for laboratory analysis. The second tap shall have a barbed fitting for samples tested in the field.
  - f. Splashboards, plastic sheeting, hay bales or a combination of these materials shall be used to ensure that no erosion occurs as pumped water is discharged and flows across the ground. Erosion control devices shall be maintained throughout the performance tests.
4. Pumping Test Records:
- a. Within two (2) days after the conclusion of the pumping tests, the Contractor shall submit pumping test records typed or neatly handwritten in black ink on a standard form that includes in the heading: the date of the pumping test, well identification and location; and the Contractor's name, address, and telephone number. The heading shall also include information on the pumping equipment, the discharge line and the flow measurement equipment. Below the heading, records shall be done in chart form showing the actual time (date, hour and minute), the elapsed time (in minutes) from the beginning of a test; the static water levels, and water level drawdown and recovery readings (in meters, centimeters, and millimeters) in the pumped well and observation wells; the pumping rate(s) (in liters per second); the orifice

head (in millimeters); weather conditions; rainfall; and any pertinent observations or occurrences.

- b. The Contractor shall submit a blank copy of the pumping test record in advance of the pumping tests for review and approval by the Engineer. A sample pumping-test record is included in Attachment 4.

B. Test for Quality of Water:

1. At the conclusion of each performance pumping test, the Contractor shall secure samples of water in suitable containers, and of sufficient quantity, for analytical testing purposes. Water samples shall be tested for bacterial, physical, and chemical analytes by an internationally accredited laboratory, also certified by the Government of Mongolia. Water samples shall be tested for those analytes specified in Table 1 in Attachment 2 to this Section and any additional analytes listed in MNS 0900:2018 (including Annexes 1 through 7) drinking water quality standard (article 6.5) for new potable water supply wells. Expenses incident to these analyses shall be borne by the Contractor and the results of the analyses shall be furnished to the Engineer.
2. Analyses shall be performed using USEPA and GoM approved methods. Samples shall be properly collected, preserved and analyzed within the required holding times. Method detection limits shall be lower than the applicable drinking-water limits.
3. The water quality analysis must be collected in accordance with MNS ISO 5667-5:2001 and transported to the accredited laboratory according to MNS ISO 5667-3 and MNS ISO 4867:99.
4. Samples for which laboratory analyses are required shall be collected in specially designated and approved sample containers provided to the Contractor by the certified analytical laboratory for the specific parameters required. Water sampling containers shall be acceptable to the Engineer.
5. The sample containers shall be clearly labeled with the well identification, and the time and date of sample collection.
6. Samples shall be stored in the appropriate manner as instructed by the laboratory and delivered to the laboratory in accordance with the laboratory's instructions. Water samples shipped outside of Mongolia for analysis shall be subject to GoM protocols and GoM approval in advance, and subject to Engineer's review.
7. Chain of Custody forms shall be completed for all water samples. Copies of the Chain of Custody forms shall be submitted to the Engineer within two (2) days of shipment of the samples to the laboratory. All persons handling the samples shall be required to sign the Chain of Custody form.
8. The Contractor shall be aware of applicable water sampling holding times for all analytes for which he is responsible and ensure that the samples are transmitted to the laboratory within these time periods.

9. Temperature, pH, Eh (redox potential), specific conductance, and dissolved oxygen shall be measured in the field during the pumping test or at any time instructed by the Engineer, and recorded with the date and time the field measurements were taken.

C. Sand and Turbidity Test:

1. At the end of each performance pumping test, sand content and turbidity shall be measured. Each well shall be pumped at the design rate of the well, or as directed by the Engineer. Well water shall be clear to the unaided eye and turbidity levels shall be less than or equal to 1 NTU. Sand content shall not exceed 2 ppm at the design pumping rate as measured with a Rossum Sand Tester.
2. Upon completion of the performance pumping-test, any accumulation of sand found at the bottom of the well screen shall be removed.

3.09 VIDEO INSPECTION:

- A. At the conclusion of the performance pumping test, Contractor shall perform a video inspection of each water-supply well to establish its as-built condition. The inspection shall be done in the presence of the Engineer. The Engineer will examine the walls of the well casing and the well screen.
- B. The video camera and equipment shall have a color monitor for field viewing, and shall be recorded in color on DVD or pen drive. In addition, the camera shall be capable of being articulated to view in the downward and sideward directions, or have multiple cameras to view downward and sideward simultaneously. The camera shall have a built-in depth counter to monitor depth in the field and record depth on the image. The monitor shall also indicate and record the date and time of the inspection, as well as the Well ID and name of the well field ("Biokombinat" or "Shuvuun").
- C. The Contractor shall submit one (1) copy of the DVD of the video inspection to the Engineer.

3.10 FINAL DISINFECTION:

- A. After installation of the temporary pump for each performance pumping test, the wells shall be disinfected by adding sodium hypochlorite, conforming to AWWA B301, or hypochlorite, conforming to AWWA B300, in sufficient quantity so that a concentration of 50 ppm of chlorine is present the entire length of the well. Disinfection solution shall be prepared and introduced into the well in an appropriate manner and shall remain in the well for period of at least 12 hours but not more than 24 hours.
- B. Information on methods for preparing disinfection solution and introducing it into the well may be found in AWWA C654.
- C. At the conclusion of each performance pumping test, water samples shall be collected and tested for the microbiological analytes listed in Table 1, Attachment 2. Should the water test positive for coliform bacteria, the well shall be disinfected and



re-disinfected as may be required until two consecutive samples of water collected at least six hours apart are found to be free of coliform bacteria.

### 3.11 SITE CLEAN-UP:

- A. After completion of the Work, remove tools, appliances, surplus materials, temporary drainage, rubbish, and debris incidental to Work. The contractor shall prevent off-site discharge of turbid water, stormwater, and other contaminants. Excavation and vehicular ruts shall be backfilled and dressed to conform with the existing landscape. Utilities, structures, roads, fences, or any other pre-existing item which must be repaired or replaced due to the Contractor's negligence shall be the Contractor's responsibility; repair or replacement shall be accomplished prior to completion of this contract.
- B. At the option of the Owner, the Contractor shall abandon existing 273- or 300-mm diameter test wells and 168-mm diameter observation wells (installed in 2019) at the conclusion of the well-construction program. Contractor shall abandon test wells as follows:
  - 1. Contractor shall disinfect the well in sufficient quantity so that a concentration of 50 ppm of chlorine is present throughout the entire length of the well prior to well abandonment.
  - 2. Contractor shall fill the bottom of the well with processed sand (see Transition Pack in Paragraph 2.07, above).
  - 3. Contractor shall then cap the processed sand with 9 meters (30 feet) of Well Sealant (see Paragraph 2.08, above) by pumping the sealant through a tremie pipe placed at the top of the backfilled processed sand.

### 3.12 DOCUMENTATION AND QUALITY CONTROL REPORTS:

- A. Establish and maintain documentation and quality control reports for pilot boreholes, well construction and development to record the desired information and to assure compliance with contract requirements, including, but not limited to, the following.
- B. Documentation shall be submitted for those items referenced in Section 02672, Paragraph 1.04A.
- C. Product Data shall be submitted for those items referenced in Section 02672, Paragraph 1.04B, SUBMITTALS, Product Data Submittals.
- D. Test reports shall be submitted for those items referenced in Section 02672, Paragraph 1.04C, SUBMITTALS, Test Reports and Other Documentation.
- E. Borehole Logs: A borehole log shall be completed for each water-supply well installed. Borehole logs shall be prepared by the Professional Hydrogeologist present onsite during all well drilling and installation activities. Copies of complete borehole logs shall be kept current in the field at each well site and shall be available at all times for inspection by the Engineer. Final borehole logs shall be submitted to

the Engineer within seven (7) days of completion of each water-supply well. Information provided on the logs shall include, but not be limited to, the following:

1. Name of the project and site.
  2. Boring/well identification number.
  3. Location of boring (coordinates, if available).
  4. Make and manufacturer's model designation of drilling equipment and name of drilling firm.
  5. Date boring was drilled.
  6. Reference data for all depth measurements.
  7. Name of driller and name and signature of Professional Hydrogeologist preparing log.
  8. Nominal hole diameter and depth at which hole diameter changes.
  9. Total depth of boring.
  10. Method of drilling, including sampling methods and sample depths, including those attempted with no recovery. Information such as rod size, bit type, pump type, etc., shall be recorded. A description of any temporary casing used, drill fluids and fluid additives used, if any, including brand name and amount used, along with the reason for and start (by depth) of its use shall be included. If measured, fluid viscosities and weight shall be recorded.
  11. Depth of each change of stratum. If location of strata change is approximate, it shall be so stated.
  12. Description of the material of which each stratum is composed, in accordance with ASTM D2488 – 17e1. Also refer to Section 02672, Paragraph 3.05 C.7, Soil Descriptions.
  13. Depth and estimated percent of drill fluid loss or lost circulation. Measures taken to regain drill water circulation. Significant color changes in the drilling fluid return.
  14. Depth to water and date measured before, during, and after each drilling shift, and prior to well installation.
- F. Well Installation Diagrams (As-Built Drawings): Submit As-built drawings for each well installed, prepared by the Professional Hydrogeologist present during well installation operations, within seven (7) days of the completion of the well installation procedure. The diagram shall illustrate the as-built condition of the well and include, but not be limited to, the following items:
1. Name of the project and site.

2. Well identification number.
  3. Name of driller and name and signature of the Professional Hydrogeologist preparing diagram.
  4. Date of well installation.
  5. Description of material from which the well is constructed, including well casing and screen, centralizers, filter pack and transition pack; diameter and schedule of casing and screen; generalized soil description; method of placement of the filter pack, transition pack and well seal; and well-seal type.
  6. Total depth of well.
  7. Nominal borehole diameter.
  8. Depth to top and bottom of screen, filter pack and transition pack.
  9. Depth to top and bottom of any seals installed in the well boring (grout or bentonite).
  10. Type of cement and/or bentonite used, mix ratios of grout, method of placement and quantities used.
  11. Elevations of key features, including ground surface, top and bottom of well casing, top and bottom of well screen, top and bottom of filter pack, top and bottom of transition pack, top and bottom of seal, static water level and bottom of well. Elevations shall be determined by land survey in meters above sea level (DSM).
  12. Other pertinent construction details, such as slot size and percent open area of screen, type of screen, and manufacturer of screen.
  13. Well location in both latitude and longitude and UTM coordinates. A plan sheet shall also be included showing the coordinate system used and the location of each well. Well locations shall be determined by land survey.
  14. Static water level upon completion of the well, and pumping level at the conclusion of the performance pumping test.
  15. Special problems and their resolutions; e.g., grout in wells, lost casing, or screens, bridging, etc.
  16. Description of surface completion.
- G. Well Development Records: A well development record shall be prepared for each well, and submitted to the Engineer within two (2) days of the completion of development under the supervision of the Professional Hydrogeologist present during well installation operations. Information provided on the well development record shall include, but not be limited to, the following:

1. Name of project and site, well identification number, dates of development and weather conditions.
  2. Contractor name and contact information, along with name of drilling foreman.
  3. Methods used for development, to include size, type and make of equipment, and pump used during development.
  4. Well depth and initial height of sand (meters) found at the bottom of the well before development commences.
  5. Date, time, and depth of static water level in the well (each day).
  6. Progressive measurements of water-levels measured during development, along with drawdown, pumping rate, specific capacity, depth setting of surge blocks and time of measurements.
  7. Description of physical character of water removed, to include changes during development in clarity, color, particulates, and odor, and time of observation.
  8. Volume and source of water added to the well, if any.
  9. Cumulative daily volume (i.e., in liters) and physical character of sediment removed.
  10. Measurements of turbidity in Nephelometric turbidity unit (NTU) measurements, and sand content in milligram per liter (mg/l) or parts per million (ppm), and time of measurement.
  11. Measurements of pH, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), and temperature during development, including time of measurements.
  12. A sample of a blank well-development record is included in Attachment 4.
- H. Well Abandonment Records: Abandonment records shall be submitted to the Engineer within seven (7) days of abandonment of each well, and include, as a minimum, the following:
1. Project name.
  2. Well or test hole number.
  3. Well/boring location, depth and diameter.
  4. Date of abandonment.
  5. Method of abandonment.
  6. All materials used in the abandonment procedure and the interval in which test materials were placed.

7. Casing, and or other items left in hole by depth, description, and composition.
  8. Description and total quantity of grout used initially.
  9. Description and daily quantities of grout used to compensate for settlement.
  10. Water or drilling fluid level (specify) prior to grouting and date measured.
  11. The reason for abandonment of the well/test hole.
  12. Engineers' written directive or authorization to abandon the well.
  13. Engineers' written approval of methods, materials used
  14. A copy of permit or regulatory approval, fee and schedule.
- I. Project Photographs/Video/Drone Surveys:
1. Refer to SECTION 01380, CONSTRUCTION PHOTOGRAPHS, VIDEO AND DRONE SURVEYS.

**Attachment 1**

**Table 1**  
**Design Pumping Rates and Minimum Specific Capacity for Production Wells**

2019 Test Well ID	Proposed Production Well ID	Design Pumping Rate (l/s) Proposed Production Well	Design Pumping Rate (US gpm) Proposed Production Well	Minimum Specific Capacity (l/s/m) Proposed Production Well	Minimum Specific Capacity (US gpm/ft) Proposed Production Well
SHUVUUN WELL FIELD					
SHU-TPW-1	SHU-PW-12	74	1173	23.8	115
SHU-TPW-2	SHU-PW-16	74	1173	10.4	50
SHU-TPW-3	SHU-PW-14	74	1173	51.2	247
SHU-TPW-4	SHU-PW-5	74	1173	24.5	119
SHU-TPW-5	SHU-PW-3	74	1173	46.4	224
SHU-TPW-6	SHU-PW-1	74	1173	37.6	182
SHU-EBW-1	SHU-PW-11	74	1173	16.5	80
SHU-EBW-2	SHU-PW-13	74	1173	14.7	71
SHU-EBW-3	SHU-PW-15	74	1173	47.8	280
SHU-EBW-4	SHU-PW-10	74	1173	45.2	218
SHU-EBW-5	SHU-PW-4	74	1173	32.4	156
SHU-EBW-6	SHU-PW-7	74	1173	26.8	130
SHU-EBW-7	SHU-PW-9	74	1173	26.8	130
SHU-EBW-8	SHU-PW-8	74	1173	27.7	134
SHU-EBW-9	SHU-PW-6	74	1173	27.0	131
SHU-EBW-10	SHU-PW-2	74	1173	27.0	131
BIOKOMBINAT WELL FIELD					
BIO-TPW-1	BIO-PW-13	71	1125	19.7	95
BIO-TPW-2	BIO-PW-8	71	1125	34.0	164
BIO-TPW-3	BIO-PW-4	71	1125	47.8	231
BIO-TPW-4	BIO-PW-2	71	1125	35.1	170
BIO-TPW-5	BIO-PW-1	71	1125	22.5	109
BIO-TPW-6	BIO-PW-12	71	1125	24.3	117
BIO-EBW-1	BIO-PW-6	71	1125	60.0	290
BIO-EBW-2	BIO-PW-14	71	1125	13.0	63
BIO-EBW-3	BIO-PW-9	71	1125	47.8	231
BIO-EBW-4	BIO-PW-7	71	1125	30.6	148
BIO-EBW-5	BIO-PW-11	71	1125	16.8	81
BIO-EBW-6	BIO-PW-10	71	1125	42.9	207
BIO-EBW-7	BIO-PW-3	71	1125	19.6	95
BIO-EBW-8	BIO-PW-5	71	1125	25.0	121

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## ATTACHMENT 2

Table 1	
Performance Pumping Test	
Water Quality Parameters for Certified Laboratory Analysis	
<u>Field Analytes</u>	
Temperature	
pH	
Conductivity	
Dissolved Oxygen (DO)	
Oxidation Reduction Potential (ORP)	
<u>Physical Constituents – For Laboratory Analysis</u>	
Color	
pH	
Conductivity	
Turbidity	
Odor	
Oxidation-Reduction Potential (ORP)	

Chemical Constituents – For Laboratory AnalysisTotal Alkalinity (as CaCO<sub>3</sub>)

Aluminum /total/, Al

Aluminum /dissolved/, Al

Ammonium, NH<sub>4</sub><sup>+</sup>

Antimony / Total, Sb

Arsenic /total/, As

Arsenic /dissolved/, As

Barium /total/, Ba

Barium /dissolved/, Ba

Beryllium / Total, Be

Bicarbonate Alkalinity /HCO<sub>3</sub><sup>-</sup>

Biological Oxygen Demand, BOD

Cadmium /total/, Cd

Cadmium /dissolved/, Cd

Calcium /total/, Ca

Calcium /dissolved/, Ca

Carbonate Alkalinity /CO<sub>3</sub><sup>-</sup>Chloride, Cl<sup>-</sup>

Chromium /total/, Cr

Chromium /hexavalent/, Cr (VI)

Chemical oxygen demand, COD

Copper /total/, Cu

Copper /dissolved/, Cu

Cyanide / Total, Cn

Dissolved Oxygen /DO

Total Hardness

Fluoride /F

Iron /total/, Fe

Iron /dissolved/, Fe  
Lead /total/, Pb  
Lead /dissolved/, Pb  
Magnesium /total/, Mg  
Magnesium /dissolved/, Mg  
Manganese /total/, Mn  
Manganese /dissolved/, Mn  
Mercury / Total, Hg  
Mercury /dissolved/, Hg  
Molybdenum /total/, Mo  
Molybdenum /dissolved/, Mo  
Nickel /total/, Ni  
Nickel /dissolved/, Ni  
Nitrate, NO<sub>3</sub>-  
Nitrite, NO<sub>2</sub>-  
Phosphorus /total/, P  
Phosphate /PO<sub>4</sub> 3-  
Potassium /total/, K  
Potassium /dissolved/, K  
Selenium /total/, Se  
Selenium /dissolved/, Se  
Silicon /dissolved/, Si  
Silver /total/, Ag  
Silver /dissolved/, Ag  
Sodium /total/, Na  
Sulfate, SO<sub>4</sub>2-  
Strontium /total/, Sr  
Strontium /dissolved/, Sr  
Thallium / Total, Tl

Total dissolved solid, TDS

Uranium /total/, U

Uranium /dissolved/, U

Zinc /total/, Zn

Zinc /dissolved/, Zn

Organic and Petroleum Compounds – For Laboratory Analysis

Volatile Organic Compounds (VOCs)

Total Organic Carbon (TOC)

Total Petroleum Hydrocarbons (TPHs)

Microbiological – For Laboratory Analysis

Total Coliform

Fecal Coliform

Escherichia coli

Pathogenic bacteria (Salmonella)

Clostridium Perfringens

Table 2	
Water Supply for Construction Purposes	
Water Quality Parameters for Field and Certified Laboratory Analysis	
<u>Field Parameters</u>	
Temperature	
pH	
Conductivity	
Dissolved Oxygen (DO)	
Oxidation Reduction Potential (ORP)	
<u>Organic and Petroleum Compounds – For Laboratory Analysis</u>	
Volatile Organic Compounds (VOCs)	
Total Petroleum Hydrocarbons (TPHs)	
<u>Microbiological – For Laboratory Analysis</u>	
Total Coliform	
Fecal Coliform	
Escherichia coli	
Pathogenic bacteria (Salmonella)	
Clostridium Perfringens	

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ATTACHMENT 3

MONGOLIA II – BULK WATER SUPPLY EXPANSION, GEOPHYSICAL-  
HYDROGEOLOGICAL INVESTIGATION, SHUVUUN AND BIOKOMBINAT  
WELLFIELDS, FINAL REPORT, DECEMBER 2019



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## ATTACHMENT 4

### SAMPLE RECORD AND REPORT FORMS:

1. Geologic Log Form
2. Grain-Size Distribution Curves
3. Borehole Geophysical Record
4. Blank Pumping Test Record
5. Blank Well-Development Record
6. Blank Well Installation Diagram
7. Sample Gravel Packed Well Diagram

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ATTACHMENT 5

GRAIN-SIZE DISTRIBUTION CURVES FROM 2019 HYDROGEOLOGICAL  
INVESTIGATION

END OF SECTION

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