

centerra**GOLD**



Centerra Gold Mongolia

Gatsuurt Project - Non Technical Summary

May 2016



TABLE OF CONTENTS

1. BACKGROUND AND INTRODUCTION	3
1.1 OVERVIEW.....	3
1.2 NTS AND THE DISCLOSURE PACKAGE.....	3
1.3 REGULATORY BACKGROUND	4
1.4 ENVIRONMENTAL AND SOCIAL SETTING	6
2. PROJECT DESCRIPTION	8
2.1 OVERVIEW.....	8
2.2 MINING OPERATIONS	11
2.3 PROCESSING.....	11
2.4 TAILINGS MANAGEMENT FACILITY.....	14
2.5 WASTE ROCK LANDFORMS	14
2.6 SUPPORT FACILITIES AND WORKFORCE.....	15
2.7 ROAD TRANSPORT	15
2.8 RESOURCE USAGE	15
3. ENVIRONMENTAL AND SOCIAL IMPACTS AND MANAGEMENT	17
3.1 AIR QUALITY	17
3.1.1 Existing Conditions	17
3.1.2 Impacts and Management.....	17
3.2 WATER.....	18
3.2.1 Existing Conditions	18
3.2.2 Impacts and Management.....	18
3.3 MINERAL WASTE	19
3.3.1 Existing Conditions	19
3.3.2 Impacts and Management.....	20
3.4 BIODIVERSITY	20
3.4.1 Existing Conditions	20
3.4.2 Impacts and Management.....	21
3.5 LANDSCAPE AND SOIL	21
3.5.1 Existing Conditions	21
3.5.2 Impacts and Management.....	22
3.6 SOCIAL IMPACTS AND MANAGEMENT	22
3.6.1 Existing Conditions	22
3.6.2 Impacts and Management.....	27
3.7 CUMULATIVE AND TRANSBOUNDARY IMPACTS	31
4. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING.....	32
4.1 MANAGEMENT PLANS.....	32
4.1.1 Environment.....	32
4.1.2 Social.....	32
4.2 ENVIRONMENTAL AND SOCIAL ACTION PLAN	32



1. BACKGROUND AND INTRODUCTION

1.1 OVERVIEW

Centerra Gold Inc (Centerra) owns and operates the Boroo Gold Mine in Mongolia (through its 100% owned subsidiary Boroo Gold Company [BGC]), which has been in operation since 2004. Centerra also hold the mining license for the Gatsuurt Gold Project (the Project) and intends to construct and operate the Project, which is the subject of this Non-Technical Summary. Centerra is used in this report to describe the implementing entity of the Project and includes those aspects of the Project operated at the Boroo Gold Mine.

The Gatsuurt mine site is located approximately 90km north of Ulaanbaatar in Mandal Soum - Selenge Aimag, in central northern Mongolia, and is approximately 50km away from the Boroo Gold Mine. Included in the plan to operate the Gatsuurt Project is the design and construction of additional processing facilities at the Boroo mine to treat refractory ore from the Gatsuurt Mine. Existing infrastructure will be used at the Boroo Mine site to process oxide ore from Gatsuurt. No ore processing will take place at Gatsuurt. The Boroo Gold Mine is located in both Bayangol and Mandal Soums and is connected to the Gatsuurt Project by a professionally engineered gravel road. Figure 1.1 shows the Project location in Mongolia.

1.2 NTS AND THE DISCLOSURE PACKAGE

This Non-Technical Summary (NTS) provides a summary of the key environmental and social risks and impacts and the management measures that Centerra will implement. This NTS is one of a number of documents to be submitted by CGM as part of the Gatsuurt Project Disclosure Package. The Disclosure Package contains a suite of documents that are available to interested parties and provide detailed information related to the Gatsuurt Project Environmental and Social Impact Assessment (ESIA). Documents included in the Disclosure Package are as follows:

	Document Title
1	Non-Technical Summary
2	Social Impact Assessment (SIA)
3	Environmental and Social Action Plan
4	Stakeholder Engagement Plan
5	Social Framework Management Plan
6	Environmental Framework Management Plans: <ul style="list-style-type: none">- Acid Rock Drainage;- Biodiversity;- Hazardous Materials;- Surface Water; and- Traffic.
7	Intangible Cultural Heritage Study Report
8	Gatsuurt Environmental Impact Assessment
9	Detailed Environmental Impact Assessments (DEIA): <ul style="list-style-type: none">- Biooxidation DEIA;- Road DEIA; and- Heap Leach DEIA.



1.3 REGULATORY BACKGROUND

The Project development is currently being financed in part by investment from the European Bank for Reconstruction and Development (EBRD) which requires compliance with the EBRD Environmental and Social Policy (2014), in addition to Mongolian legislation. The Project's key environmental and social requirements under Mongolian laws are regulated through the application of the Law on Environmental Impact Assessment (2012) and the Minerals Law (2006). Centerra has already secured most of the required Project environmental approvals under this legislation through the development of a number of Detailed Environmental Impact Assessments completed by independent, licensed Mongolian companies. The impact assessment reports contain enforceable commitments for protection of the environment, monitoring and the avoidance and mitigation of Project related impacts.

The EBRD seeks to ensure through its environmental and social appraisal and monitoring processes that the projects it finances are:

- Socially and environmentally sustainable;
- Respectful of the rights of affected workers and communities; and
- Designed and operated in compliance with applicable regulatory requirements and good international practice.

In order to translate this objective into successful practical outcomes, the EBRD has adopted a set of specific Performance Requirements (PRs) that clients are expected to meet, covering key areas of environmental and social impacts and issues. The EBRD is committed to promoting European Union (EU) environmental standards as well as the European Principles for the Environment, to which it is a signatory, and is reflected in the PRs.



Figure 1.1 Project Location



1.4 ENVIRONMENTAL AND SOCIAL SETTING

The Gatsuurt gold deposit is located approximately 35km to the south of Centerra's existing Boroo Gold Mine and processing facility. Tunkhel village is located 14km to the east and Zuunkharaa town is 34km to the northwest of the Gatsuurt Project. The existing 52km access road between the Boroo and Gatsuurt sites was permitted, engineered and constructed between 2005 and 2010 as a mine haul road which was converted by order of road administrative authorities into a combination of mine and public road (see Figure 1.2). Though a signed agreement between the local administration and BGC states that the road maintenance duties would be shared between the local administration and Centerra, the road is maintained solely by Centerra.

Artisanal gold mining of the river alluvium has occurred in the past within the Project area along the Gatsuurt River valley and has significantly altered the appearance, drainage and water quality within the valley and permanently damaged the top 5 to 15 metres of the surface. Most of the soils, vegetation, aquatic and subaquatic ecosystems were disrupted and/or permanently lost as a result of this alluvial mining. These losses to the ecosystem may restrict the range of reclamation that can be performed on the property. However, the mine closure and reclamation planning proposes to use available soils and materials to restore the site at the cessation of mining to achieve a safe and stable landscape.

The Gatsuurt area is characterized by numerous shallow excavations, piles of alluvial sands and trenches of various dimensions that are located within the proposed mine area as a result of these past mining activities (Figure 2.1 shows the area impacted by past mining activities).

Water quality within the Gatsuurt River valley has been impacted by the previous mining activities by other companies, with increased sedimentation of surface water and higher than normal concentrations of some heavy metals and other elements, including arsenic, following the exposure to air of previously buried and saturated soil and rock layers. The exposure of these rocks during past mining activities causes chemical reactions that release naturally occurring metals into the environment through a process called acid rock drainage. In addition to the impacts of past mining activities, the forest surrounding the Gatsuurt valley has been and continues to be subjected to harvesting for timber. Evidence suggests that much of the timber harvesting in the Gatsuurt areas is unregulated.

Mandal soum has the largest population of any soum in Mongolia at just over 25,000 people. The soum is a prime agricultural and cropping area in Mongolia. Furthermore, 70% of the Soum is covered by forested land, which supports forestry. Similar to Mandal soum, Bayangol is a prime agricultural area, and is connected to Ulaanbaatar, Darkhan and Selenge by a paved road, and by railway, on road and rail routes connecting Mongolia with Russia. Some of the key social issues in the area include the lack of vocational education opportunities, unemployment and underemployment, extensive land degradation due to overgrazing and poor agricultural practices, and inadequate availability of health care personnel.

The examination of extensive drilled holes at Gatsuurt has not found any permafrost that could be affected by the mining and associated development activities. It is not expected that any permafrost will be disturbed by the Gatsuurt mining development; however, should permafrost be identified in the Project Area, Centerra will consult with the relevant authorities and the Mongolian Academy of Science to ensure that any adverse impacts to environmental, social or cultural values are mitigated accordingly.

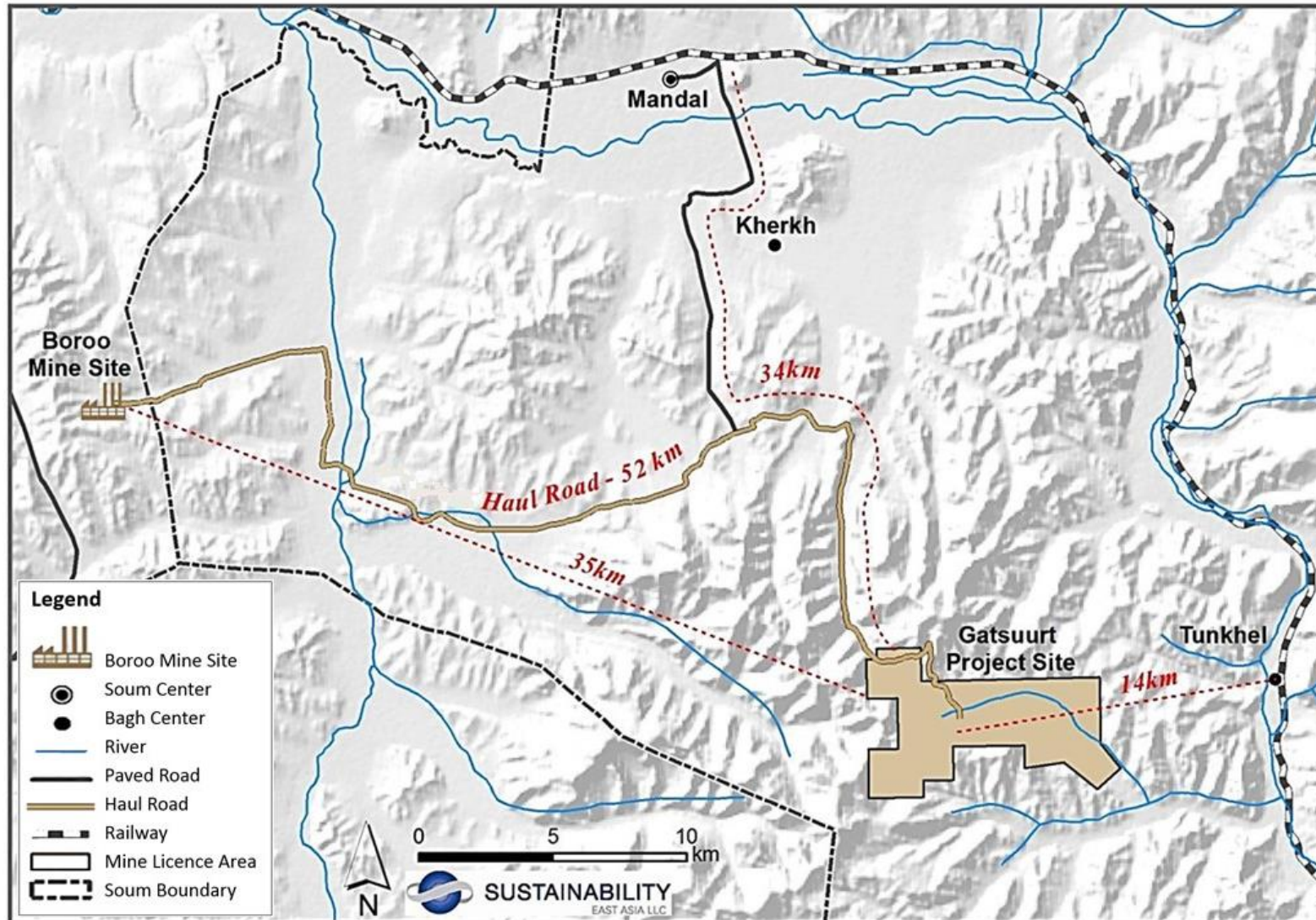


Figure 1.2 Gatsuurt Project Area



2. PROJECT DESCRIPTION

2.1 OVERVIEW

A detailed overview of the Gatsuurt Project is provided in Table 2.1 and Figure 2.1 shows an operational overview of the Gatsuurt Mine.

Table 2.1 Gatsuurt Project Overview

Component	Activities
Open Pit Mining at Gatsuurt	<ul style="list-style-type: none"> Excavation and recovery of ore and waste using explosives, excavation equipment and haul trucks. Stockpiling of ore. Storage and use of explosives within a dedicated magazine. Dewatering of open pits.
Stockpiles and Dumps at Gatsuurt	<ul style="list-style-type: none"> Rehandle and transport of ore to Boroo Gold Mine by truck. Waste dumping and construction of stockpiles at Gatsuurt.
Ore Processing (at Boroo Gold Mine)	<ul style="list-style-type: none"> Unloading and feeding of ore to process plant. Grinding and flotation of materials. Biological oxidation of ore. Carbon in Pulp processing of ore. Limestone crushing and storage. Storage, handling and use of chemicals and reagents. Discharge of process waste to Tailings Management Facility. Treatment of waste tailings to remove arsenic and cyanide. Water supply for ore processing. Upgrade of electrical power supply to meet additional Gatsuurt ore treatment requirements.
Tailings Management Facility (at Boroo Gold Mine)	<ul style="list-style-type: none"> Increase height of tailings dam to accommodate additional tailings volume. Construction of new tailings cell for disposal of tailings from biological oxidation process. Engineering and environmental monitoring.
Other Mine Facilities and Infrastructure at Gatsuurt	<ul style="list-style-type: none"> Fuel handling, storage and use. Use of access road and haul roads. Waste water treatment from worker facilities. Transfer of mining and domestic waste to Boroo mine. Construction and Operation of electrical transmission line. Operation of site domestic water supply. Vehicle workshop and site facilities.



Component	Activities
Ancillary facilities at Boroo Gold Mine	<ul style="list-style-type: none">• Additional worker accommodation for construction and operations.• Fuel handing storage and use.• Workshops for haulage fleet maintenance.
Surface Water Management at Gatsuurt	<ul style="list-style-type: none">• Clean water diversion channel construction and maintenance.• Monitoring of diverted water discharge.• Mine water containment and collection.• Mine water sediment removal and water treatment.• Monitoring of treated mine water discharge.

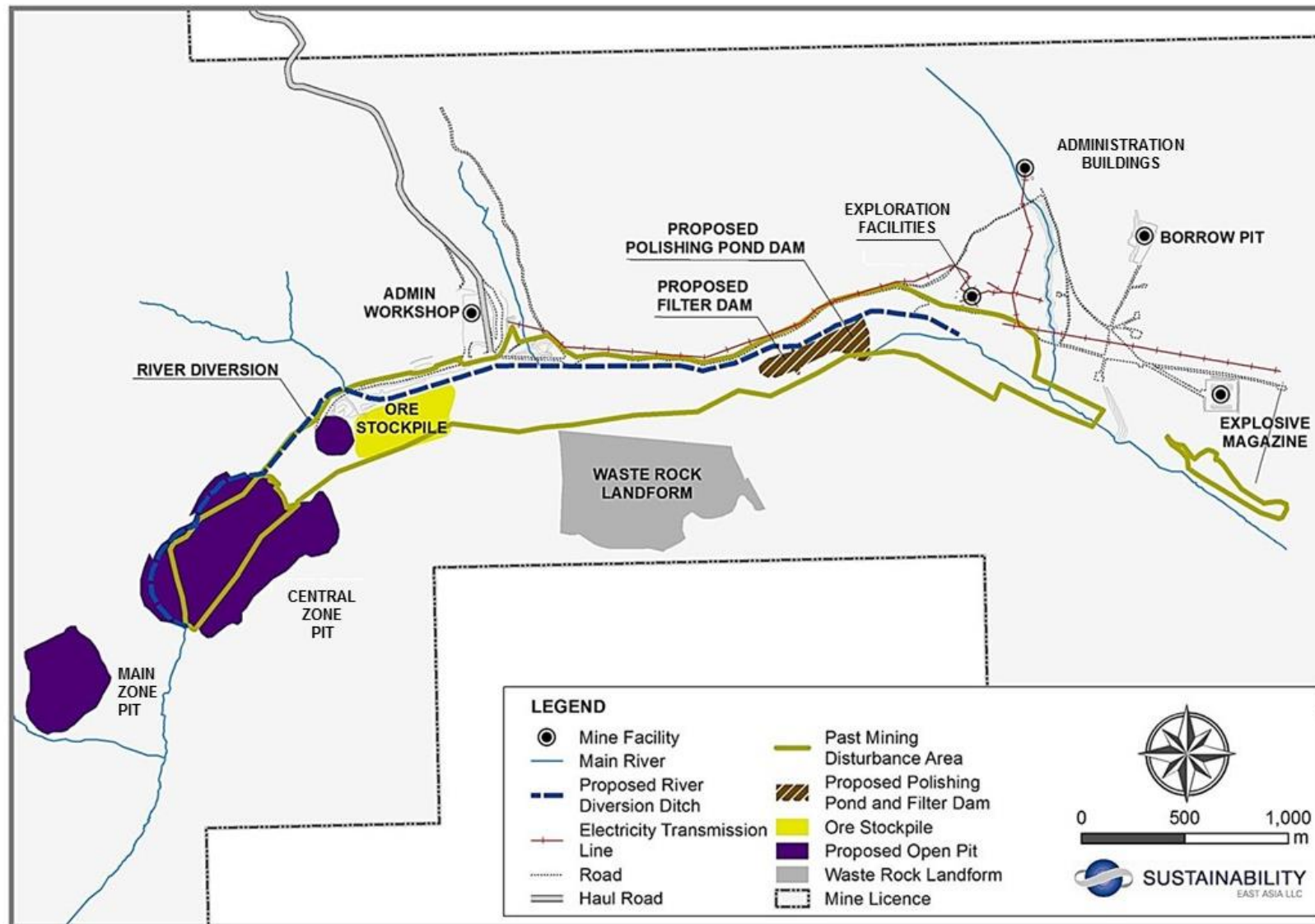


Figure 2.1 Gatsuurt Mine Site Operational Overview



2.2 MINING OPERATIONS

The Gatsuurt Project has an estimated mine life of nine years, with a planned commencement date for operational mining to occur in 2016. The mining method will be a traditional open pit operation. The total mining reserve contained in the Central and Main Zone pits is estimated to be 17.13 million tonnes of ore containing 1,603,000 oz. of gold. The open pit mining will require the excavation of an estimated 89 million tonnes of waste rock material that will be stored in waste stockpiles located near the open pits. The Gatsuurt deposit will be mined at a nominal rate of 35,000 tonnes/day to generate 1.75 million tonnes/year of ore for processing at the Boroo Gold Mine processing plant. The ore and waste will be mined from the open pits using drill and blast methods where explosives are placed into drill holes to break up the rock. The broken rock is then excavated using machinery and loaded onto trucks for transport to the ore stockpile or the waste rock piles. Ore will be shipped from the Gatsuurt ore stockpile to the Boroo Gold Mine run of mine pad for processing at a rate of 5,000 tonnes/day. Mining and ore haulage will operate 350 days per year on a 24-hour continuous shift basis. The mining process for the Gatsuurt Project is shown in Figure 2.2 below.

2.3 PROCESSING

Ore is transported to the Boroo Gold Mine processing plant where it is stockpiled. From there, it is loaded into the jaw crusher where it is crushed to a suitable size and then subsequently moved through a conveyor belt to the grinding circuit. The grinding circuit adds water to the crushed product to produce slurry. The product is then transferred to the fine grinding circuit. Oversize product from the grinding circuit is returned to the crushing circuit where it moves through the circuit once again.

Gatsuurt ores will be processed at the existing processing facility located at the Boroo Gold Mine. Processing will include primary crushing followed by mill grinding, gravity gold recovery, sulphide flotation, biological oxidation of flotation concentrates, neutralizing, cyanide leaching, gold recovery, gold electrowinning and d'oré bullion production.

The Gatsuurt ore is a combination of both oxide ore and sulphide ore, with metallurgical testwork indicating that additional processing facilities are needed to optimize gold recovery rates from the sulphide ore. The oxide ore can be treated through the traditional Carbon-In-Pulp process; this method uses cyanide to extract gold from the ore and is already in operation at the Boroo Gold Mine processing facility. The final waste material that remains once the gold is removed using the Carbon-in-Pulp process is disposed of to a tailings management facility following removal of arsenic and cyanide through a tailings treatment process.

The sulphide ore is considered a double refractory ore which requires additional treatment for gold extraction. Feasibility studies indicated that the sulphide ore was amenable to biological oxidation (BIOX) to increase the recovery of gold from the process. Sulphide ore material from the grinding circuit is fed to a bank of 6 flotation cells which recover a percentage of the flotation feed as a rougher sulphide concentrate. The flotation concentrate is screened and thickened in a high-rate thickener prior to being pumped to the biological oxidation circuit, with the waste overflow sent to a new tailings cell in combination with the overflow from the neutralisation circuit to form a "clean" tailings waste discharge (no cyanide content). The recovered water from this clean tailings discharge is then recycled back into the process plant.



The internationally accepted BIOX process works through oxidation of the sulphide minerals due to the action of bacteria, *Thiobacillus ferrooxidans*, on the sulphide ore particles. Nitrogen, phosphorous and potassium are required for bacterial growth and are added as a solution. A finely ground limestone slurry is added to maintain solution pH in the optimum range for bacterial growth.

After the biological oxidation process has taken place, the oxidized product is washed in a circuit consisting of three thickener tanks in series. The underflow from the second thickener is neutralised with hydrated lime in four tanks in series. The pH is raised in the first two neutralisation tanks to precipitate the soluble iron and arsenic. In the third and fourth tanks, hydrated lime is added to further increase the pH in preparation for treatment in the Carbon-in-Pulp process used for the treatment of oxide ore described above.

Tailings generated from the process plant have been analysed for cyanide content as required under the Company's regulatory permits. Feasibility study testwork indicates that the cyanide levels measured, in the Weak Acid Dissociable (WAD) form, will meet Mongolia's and Centerra's regulatory requirements.

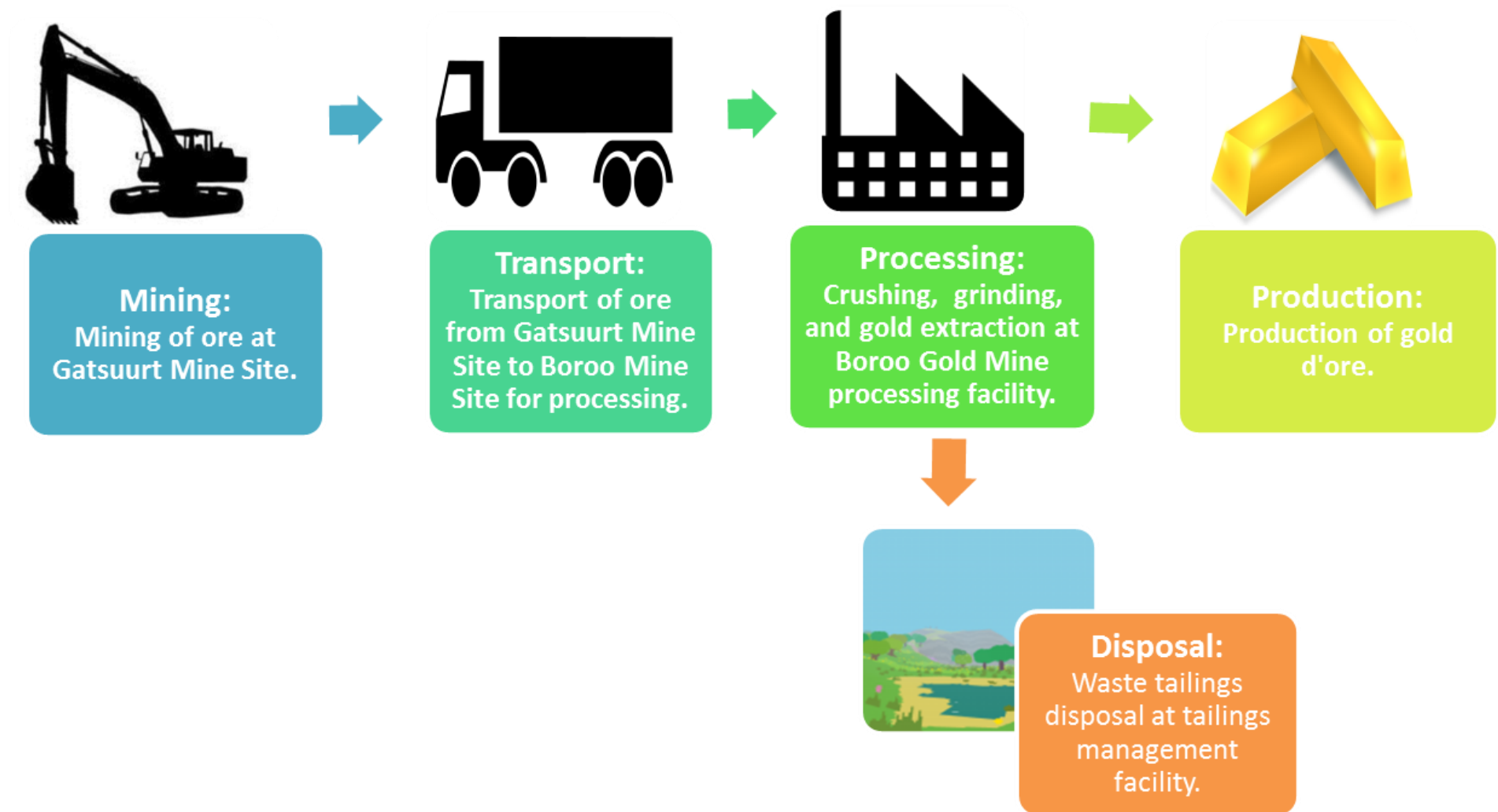


Figure 2.2 Processing Overview



2.4 TAILINGS MANAGEMENT FACILITY

The Tailings Management Facility (TMF) is located at the Boroo Gold Mine operation, near the confluence of the Ikh Dashir and Baga Dashir valleys, about 6km east of the process plant. The original TMF was designed and constructed in stages between 2003 and 2008 initially for use by the Boroo Mine operations. The facility consists of a 1.5mm thick compacted clay liner base with the perimeter wall sealed with a High Density Polyethylene (HDPE) liner on the upstream face. A network of monitoring wells is used to detect any water that may enter the wells through the dam liner materials. A series of water monitoring wells are in place to detect any seepage of tailings leachate that may occur. During the life of the Boroo Gold Mine project, none of the monitoring wells have indicated contamination of nearby groundwater.

As a result of the addition of the biological oxidation process at the Boroo Gold Mine processing plant, the use of the TMF will be altered. A new cell to the east of the existing structure will be constructed for the Gatsuurt Project. This new TMF cell will be used to contain the “clean” tailings stream from the flotation and neutralisation overflow. Water from this cell will be recycled for reuse in the process plant.

The existing TMF will be utilised for the Carbon-in-Pulp tailings stream that is treated to reduce cyanide and arsenic prior to disposal to the tailings facility. The cyanide levels will continue to meet the current regulatory limit of 1 mg/L weak acid dissociable (WAD) cyanide at the discharge to the TMF. The processing of the Gatsuurt ore will result in increased concentration of thiocyanate in the Carbon-in-Pulp tailings but this chemical is far lower in toxicity than cyanide. However, the thiocyanate concentrations in the Carbon-in-Pulp tailings would harm the bacteria in the biological oxidation process so the water from these tailings will not be recirculated to the process plant. An operational water balance is in place for the Boroo processing facility and will be revised during detailed design of the additional processing facilities in order to manage the appropriate freeboard capacity within the existing TMF and prevent overtopping of the facility.

2.5 WASTE ROCK LANDFORMS

Waste rock will be segregated into material that is Potentially Acid Generating (PAG) and Non-Acid Generating (NAG) material. PAG material includes the rock types that contain high levels of sulphide and which, when exposed to air, are likely to oxidise and produce acid that may mobilise harmful heavy metals in the environment. The PAG material has been identified from testwork undertaken in international laboratories. PAG rock will be placed into the mined-out Central Zone Pit as the preferred option for disposal. The Central Zone Pit PAG will be covered with water to cut off oxygen and thereby stop the Acid Rock Drainage reactions. Ongoing waste rock testing may indicate that more PAG rock exists than previous studies had indicated. Any surplus PAG will be placed in the Main Zone Pit. As a final option, PAG material that cannot be placed in either the Central Zone Pit or the Main Zone Pit will be placed in an engineered surface waste rock facility.

It is expected that there will be about 9 million tonnes of PAG material while there will be approximately 36 million tonnes of NAG material. In the event that a PAG rock pile is required to be constructed, it would be laid down with stable 2.5:1 or 3:1 outside slope for long term stability. The PAG pile will be covered with an engineered earthen cover that is designed to limit the incursion of water into the pile. This would have the effect of slowing the development of ARD and making the volume of any ARD seepage manageable within the water management system.



The NAG waste rock will be stored in a single waste rock landform located to the south of the Central Zone pit. The dump will abut the south side of the valley, will have a final height of about 80 m and has been designed with an adequate factor of safety to ensure stability. The dump will be constructed at angle of repose but will be configured in 20 m lifts allowing re-sloping to 3:1 in order to permit re-vegetation as required.

2.6 SUPPORT FACILITIES AND WORKFORCE

During the operating phase of the project, Gatsuurt operating personnel will be housed at the existing facilities at the Boroo Gold Mine and transported to and from Gatsuurt on a shift to shift basis.

A 400-person construction camp will be located to the east of the existing Boroo accommodation facilities. This camp will include 30-person management accommodation units built next to the Boroo facility, and 80 4-person gers, kitchen/dining facility and recreation facility.

There is no planned Centerra worker accommodation facility to be located at the Gatsuurt mine.

2.7 ROAD TRANSPORT

A gravel-surfaced 56km long, road was constructed between Gatsuurt and Boroo in 2010. The haul road is also a public road and was constructed by Centerra for the Mandal soum government. This is an 8-metre-wide single lane road, with a passing lane strategically located along the route to allow traffic to pass safely. The haul road will be used by the Project for ore haulage and all Project vehicle movement between Boroo and Gatsuurt (see Figure 1.2. Gatsuurt Project Area). All ore mined from the open pits at Gatsuurt will be delivered to the ore stockpile located adjacent to the Central Zone pit. Then, ore will be transferred via excavator into highway trucks for transport to the Boroo processing plant via the haul road. At the full mine production rate of 5,000 tonnes per day, a fleet of up to 28 haul trucks may be required for ore haulage on a continuous 24-hour shift basis. Trucks will cover the 56km route six to seven times daily (which is an average of six haul truck movements per hour, i.e. an average of one fully laden truck travelling to Boroo plus one empty truck travelling to Gatsuurt, every 20 minutes). The ore haul fleet is owned by Centerra and will be operated under the supervision of the Company. Fuel for the haul fleet will be provided at Gatsuurt site and maintenance of the haul fleet will also be predominantly undertaken at Gatsuurt site. There will be a need for approximately 144 haul truck drivers during the operation of Gatsuurt. A stipulation of the ore haul contract will be that drivers and maintenance personnel will be hired locally on a priority basis, in line with Centerra's existing employment policy specifications.

2.8 RESOURCE USAGE

The addition of the biological oxidation circuit to the existing Boroo Gold Mine processing plant will require an additional 12 MW of electrical power. The existing power at Boroo is supplied from a regional electrical power grid. When the demand and utilization factors are applied, the estimated peak demand is expected to be approximately 8.9 MW. This will require an additional transformer of 15 MVA, 110-33 kV capacity to support Project requirements.



The existing substation at Boroo will be upgraded to include parallel 15MW transformers with tie breakers installed to provide flexibility and backup to run the plant on a reduced rate in the event of a transformer failure. In addition, a second 6km, 110-kV power line to Boroo will be installed in parallel with the existing line, as well as the necessary low voltage power distribution system to provide power to the additional process circuits.

A significant requirement is the three 650kW back-up power supply units in the form of diesel fired generators located on-site to maintain the operation of the large air blowers used for the bio-oxidation reactors in the event of a power outage.

Power at the Gatsuurt mine area will be serviced by an existing 10-kV line from Tunkhel. This line will be upgraded to provide 500kW of power for distribution to ancillary buildings at Gatsuurt.

Fresh water required at the Boroo process plant will be taken from the existing bore field located in Boroo river valley to the east of the mine and pumped to a water storage tank at the process plant site. The fresh water supply system is designed to supply an average flow of 300 m³ per hour.

An existing potable water treatment plant will treat the fresh water prior to storage in the potable water storage tank. Sewage will be collected and chlorinated before disposal. Effluent from the sewage treatment plant will be discharged into the tailings facility at Boroo and a septic field at the Gatsuurt site. The capacity of the sewage system will be increased to accommodate the enlarged permanent camp and the addition of temporary facilities.

At the Gatsuurt site, diesel and gasoline storage facilities will be provided at the mine services area. One diesel fuel storage tank and one gasoline storage tank will be installed above-ground. A mine maintenance/operations administration building and a security gatehouse facility will be built at the mine site.



3. ENVIRONMENTAL AND SOCIAL IMPACTS AND MANAGEMENT

3.1 AIR QUALITY

3.1.1 Existing Conditions

Air quality in the Gatsuurt area is generally very good due to the lack of emission sources. The only man-made emission sources affecting the area are dust from the use of the access road to the Gatsuurt site, including public traffic, and natural wind-blown dust as a result of local weather conditions.

Centerra has undertaken air quality monitoring within the Project area, including the access road, for a number of years and an air quality monitoring dataset is available which provides an understanding of baseline dust levels.

The processing of Gatsuurt ore at Boroo is not expected to result in any additional significant impacts, or significant change to existing impacts.

3.1.2 Impacts and Management

The following activities are expected to occur as a result of Project construction and operation and are considered to be the primary generators of atmospheric emissions:

- Dust generated from clearing of natural vegetation during Gatsuurt mine start up and process plant construction at the Boroo Gold Mine;
- Dust from Gatsuurt mine open pit mining activities including blasting and handling of waste rock and ore;
- Vehicle emissions from mine and haulage fleet;
- Generation of emissions from point source infrastructure, and including back-up diesel generators; and
- Dust generated from road transport onsite at Gatsuurt and on the access road to Boroo Gold Mine.

Management of mining and transport activities to minimise dust emissions will use tested methods applied by Centerra for the Boroo Gold Mine operations. These methods include limiting vehicle speed, watering of road surfaces and using road construction methods and materials that minimise dust generation. Management actions will be captured in an Atmospheric Emissions Management Plan to be implemented during the Project activities.

The Gatsuurt area is not located nearby any sensitive receptors, although the generation of dust through transport of ore along the haul road to the Boroo processing plant has the potential to impact local herders, crop farmers, livestock, pasture- and crop-lands. Management actions related to the use of the haul road are captured in the Community Traffic Management Plan.



3.2 WATER

3.2.1 Existing Conditions

Natural background water conditions in the Gatsuurt Project area are impacted by the previously mined area within the Gatsuurt River valley whereby water flowing over or through the mined area contains elevated concentrations of Arsenic. Water monitoring undertaken by Centerra over several years in the areas within and downstream of the previous alluvial mining areas in the Gatsuurt River valley floor has shown elevated levels of contaminants in surface and groundwater including arsenic, iron, aluminum, copper, ammonium, nitrate and zinc.

Surface Water

The Gatsuurt River, which flows through the mine site, has a catchment area of about 36km² at the confluence with the Balj River, which in turn empties into the Kharaa River 5.5km distant. The total flow distance of the Gatsuurt River, from the Gatsuurt License boundary to the Kharaa River is 11km.

The Gatsuurt River originates from a point approximately 4.4km upstream of the proposed Central Zone Pit, which is also the approximate location where the existing disturbance area begins. All rivers and freshwater lakes freeze in the winter, and smaller streams commonly freeze to the bottom. Surface water in the project area is rare, with small streams flowing only in response to rain storm events.

Groundwater

The unconfined shallow groundwater flow in the Gatsuurt river valley is interconnected with the surface water, with flows typically close to the surface and following topography. Groundwater levels may vary significantly depending on rainfall.

3.2.2 Impacts and Management

Water disposal, ore storage, transport, and waste generation have potential to impact water quality. The general objectives of water management are to maintain the quality and hydrological function of the water systems within and surrounding the Project area.

Potential impacts to water resources during construction and operation phases include:

- Interruption to existing surface water flow patterns;
- Reduction of surface water runoff volume and quality, and hence downstream vegetation, in water courses downstream of the development/infrastructure;
- Discharge of chemicals, including hydrocarbons and various reagents; and
- Potential for Acid Rock Drainage (see Section 3.4).

Surface Water

Hydrological consultants have completed a detailed surface water assessment for the Project, which summarises the options for management of surface water flows. Currently, Centerra is progressing a water management scenario involving the diversion of surface water flows upstream of the mine operation through a diversion pipeline located on a mine pit bench within the Central Pit Zone. The diversion pipeline will capture all upstream water prior to it contacting the any mine-impacted feature and divert it through the pipeline to downstream of the Project location. This water is unaffected by mining activities and as such does not require treatment prior to discharge.



Groundwater

Groundwater flow into the mine pits is expected, meaning that water will be in contact with the ore body as well as potentially impacted by mining activities. Where possible, groundwater extraction wells will be used to prevent inflow of water to the pit and will allow groundwater to be discharged without any contact with mining areas. Where water does flow into the mine pit, it will be directed to a polishing pond through an in-pit dewatering system for treatment prior to discharge. Water will be treated through a precipitation process to remove components of concern including arsenic. This will allow sediment to settle prior to it being discharged downstream after monitoring data provides confirmation that all parameters are below applicable discharge criteria.

It is expected that all water removed from the pit (whether from groundwater / surface water flows or rainfall) will contain elevated levels of suspended solids / sediment, and residual arsenic. Levels of ammonia and nitrate from the use of blasting agents are typically elevated for a short time following mine closure as a result of residue from blasting agents that are used during mining.

Dirty Water Treatment

The treatment of dirty water captured through the surface and groundwater management features shall be treated through a two stage linear process involving a sedimentation pond to allow suspended settlements to drop out of the water column. From the sedimentation pond the water will flow to a polishing pond where the water will be treated with a flocculent to facilitate the precipitation of contaminants such as arsenic into an insoluble solid which is then removed from the pond through filtration.

Greenhouse Gas Emissions

Predicted greenhouse gas emissions have been calculated for the Gatsuurt operations as 36,156 tonnes of CO₂ e.q. per year from direct Project emission sources including fuel use, and 64, 629 tonnes CO₂ eq per year of indirect emissions related mainly to the use of electricity from the Mongolian grid.

3.3 MINERAL WASTE

3.3.1 Existing Conditions

Testwork undertaken for the Project indicates that while the majority of waste rock is not expected to generate Acid Rock Drainage (ARD), the potential for mobilisation of arsenic in water run-off is possible. Management of mine waste needs to consider the potential for the formation of ARD to take place. ARD is a complex process in which pyrite and other sulphide minerals exposed to oxygen and water, as well as bacteria, oxidise to produce dissolved metals, sulphate, and acidity. The mobilisation of dissolved metals from the rock has the potential to contaminate ground and surface waters in the Project area.



3.3.2 Impacts and Management

Operationally, the characterisation of waste rock into PAG or NAG (NAG waste testing is planned to be accomplished using on-site testing methods such as using a LECO Sulfide analysis machine). Evidence suggests that the cut-off measure that seems most reasonable for Gatsuurt rock at this time defines PAG as rock that has 0.3% or more of sulfides. It is this rock that would be stored adjacent to the Central Zone open pit for disposal below the water level of the pit once mining was finished at the Central Zone. Another testing approach that would likely provide a relatively fast turnaround time is to send waste rock samples out to a local laboratory for analysis where the turnaround time for sulfide results should be relatively short. This short period of time for analysis facilitates selective placement of the waste.

As mentioned in Section 2.5, onsite ARD testing may also show that more waste rock requires ARD mitigation than the pre-mine ARD testing had indicated. This may mean that the waste rock that has ARD potential may have a greater volume than the Central Zone Pit can hold and still act as a mitigation measure. Therefore, an unknown volume of ARD generating material that is detected after mining starts may need to be stored in one or more alternative locations. The preferred storage area if the Central Zone Pit is unavailable would be the Main Zone Pit and / or a separate waste rock facility that is covered with an engineered soil covering that discourages the infiltration of atmospheric water in the stored waste and thereby effectively discouraging the generation of ARD.

3.4 BIODIVERSITY

3.4.1 Existing Conditions

Flora

The Gatsuurt survey area is located at the interface of the Mongol-Daurian and the Khentei botanical-geographic regions, and consequently exhibits high species diversity within forest-steppe plant community types. Terrain ranges from lower elevation, gentle slopes supporting forb-dominated meadows and mesic, mixed forest community types, to very steep, drier slopes supporting variations of the mixed forest and pine-dominated community types. A willow-birch riparian community type is located on the Gatsuurt River above the existing placer disturbance. Disturbed soils on the old placer mining deposits and along local roads support a ruderal community type comprised of early successional plant species.

Fauna

Wildlife inhabiting the Gatsuurt survey area includes small numbers of large mammals such as Siberian roe deer (*Capreolus pygargus*), small and medium-sized mammals, and a variety of resident and migrant birds. One species of reptile, one amphibian and one species of fish were also encountered during the July 2006 surveys. Species composition is expected to vary seasonally, and other species in addition to those recorded during the approximately ten-day long field survey are expected to occur in the area. The greatest species diversity would be expected to occur in the spring and summer months, when migratory breeding birds arrive to nest in the area. The Project is not located within any listed specially protected areas and there are no animal species that are listed in the Red Book of Mongolia or under any international (IUCN) classifications.



3.4.2 Impacts and Management

The main impacts to biodiversity as a result of the Projects development may include:

- Habitat loss;
- Loss of local forest resources;
- Loss of or disturbance to rare or endangered species;
- Decline in local wildlife populations;
- Wildlife deaths as a result of vehicle strike along the Project haul road; and
- Wildlife interaction with potentially harmful reagents in solution at the Boroo TMF.

Although some medium and high quality habitat will be removed from site area, large areas of the Gatsuurt valley, where the proposed mine facilities are to be located, have been previously disturbed by historical mining activities and are currently un-vegetated with exposed mine workings (reworked subsoils). The magnitude of the impact to terrestrial biological resources is further reduced given the availability of large expanses of similar vegetation nearby and the planned implementation of a site closure and rehabilitation plan following operations. The implementation of the mine closure and reclamation plan also allows for the rehabilitation of some of these disturbed areas that otherwise may not have been rehabilitated, providing a positive environmental impact within the Project area.

Speed limits on the haul road will be limited in order to reduce the potential for wildlife mortality as a result of vehicle strikes. Drivers shall also be made aware of their environmental requirements through a training and awareness program.

As previously discussed, management of the TMF discharge to ensure levels of cyanide and arsenic are at or below 1.0ppm to insure impacts to bird life are minimised. Centerra is a signatory to the International Cyanide Management Code (the Code) and is certified as fully compliant with the Code, which is considered international best practice with regards to cyanide management. The Code sets limits on the levels of cyanide allowed to be present in TMF water solutions in order to minimise impacts to wildlife. Additionally, the Government of Mongolia has set water quality limits on the TMF water that are substantially more stringent than the Code requirements and these strict standards have been complied throughout the operational life at Boroo Gold Mine's operations. As a result, impacts to bird life that may utilise the TMF area are considered unlikely.

3.5 LANDSCAPE AND SOIL

3.5.1 Existing Conditions

The Project location is in a forested area within a river valley. Approximately 146ha of land has been impacted by historical alluvial mining activities and approximately 50% of the lands proposed for the Gatsuurt mine and site facilities have been previously disturbed.

Outside of the already disturbed areas, the soil in the area is considered fertile, rich in nutrients and organic matter. No limiting elements were detected in the soil and soil in project area is suitable for agricultural use, including for farmlands, pastureland and hay preparation.



3.5.2 Impacts and Management

Landscape impacts are not expected to be major. The Project is operating in a historically disturbed area and as such reclamation activities are expected to address legacy disturbance in addition to mitigating the impacts of land disturbing activities from the mine.

3.6 SOCIAL IMPACTS AND MANAGEMENT

3.6.1 Existing Conditions

Demography

There are unique demographic challenges confronting Mandal and Bayangol *soums*. Due to its large population of youth between the ages of 20 and 24, the key challenge for Mandal *soum* is driving vocational educational, economic opportunities and work spaces for youth. In Bayangol *soum*, the key challenge based on its large population of young children is providing sufficient educational facilities. Statistically migration is declining in the Project area, although there is a perception among communities in the Project area that there is an influx of migrant herders who are viewed as a key source of pastureland degradation and land use conflict. An emerging risk is the growing number of female headed households in the Project area and the accompanying increase in vulnerable households. The highest percentage of the population with no formal education at all is seen in Tunkhel *bagh* (11%) and so Tunkhel *bagh* citizens may be less equipped to take advantage of any economic and employment opportunities presented by the Project due to lagging education indicators.

Social Structures

The levels of trust in public institutions in the Project area are generally low due to community dissatisfaction with the activities of public organisations, especially political parties. Community perceptions on corruption are also a key source of discontent with the political situation in both Mandal and Bayangol. In both *soums*, the *soum* Citizens Representative Khural (CRK) and *soum* Government have the greatest overall levels of trust among public organisations. *Baghs* face unique challenges in the Project area, including the perception among *bagh* citizens that their voice does not count or is not heard in decision-making. Welfare and community upliftment projects have generally low levels of awareness in the Project area. The program with the highest level of awareness is the “restocking livestock program” run by the Government.

Economy

Steep price inflation of goods and services is the major concern for households in the Project area, as are the poor quality of goods. Tunkhel *bagh* households experience these issues most acutely in the Project area due the *bagh's* more remote location. A related issue is that households in the Project area appear to be increasingly living on credit, and struggling to pay back their loans. Households in the Project area are also increasingly frustrated and limited by their lack of access to professional assistance, knowledge and technology on effective crop and vegetable farming methods that may assist them in being better farmers and in obtaining higher yields. Moreover, livestock insurance coverage is low in the Project area, driven by a general lack of awareness of insurance (in the case of *dzud*, fire, drought or natural disaster). There is also a general lack of awareness about the formal mining sector in the Project area, the processes and technicalities thereof, and the potential benefits and risks associated with large scale mining.



Employment

Job creation is generally low across the Project area and unemployment is also significant problem. This is particularly an issue among younger people, most of whom are educated. Youth unemployment and lack of opportunity is arguably the biggest concern to the community in Tunkhel *bagh*. Related to the high levels of unemployment in the Project area is the problem of under-employment. Many of the available jobs are temporary and / or seasonal and therefore mean that people are unable to draw a steady income. Monthly average salaries are lowest in Tunkhel *bagh*, whose population is also the least educated in the of Project area. Income diversification strategies are an important way in which households manage risk, and most households engaged in multiple activities to supplement their incomes.

Social Infrastructure

Kindergarten facilities are stretched to over-capacity in both Mandal and Bayangol, with children being turned away. There are limited opportunities in the Project area to access tertiary and vocational education and the facilities that do exist in Mandal *soum* provides vocational training for a predominantly male student population in traditionally male professions. Households in the Project area primarily receive information, news, and entertainment from television rather than radio. Vehicles and the railway are the most common forms of public transport, with rail transport the most popular. Baseline studies suggest that construction of the Project haul road has enhanced opportunities for local small businesses.

The main sources of drinking water in the Project area are wells, rivers and springs, and mobile distribution points. The majority of households residing in *soum* centres consume energy from the central energy system as well as from renewable energy sources, especially solar energy (in particular for herders and those in Bayangol). Tunkhel has a greater reliance on the local diesel system (which only works in the winter months) compared to other *baghs*. Heat supply is an essential basic service in Mongolia, but it is not accessible to everyone, in particular, people in rural areas. The current heating system in *soums* mainly consists of (i) small stoves; and (ii) coal fired boilers. The majority of heating in households is independent of the centralised grid.

Land Use and Natural Resources

Overgrazing and the accompanying pastureland degradation is a central issue in the Project area, due to existing herders and livestock owners having increased the number of animals they own in recent years. Overgrazing problems has led in some areas to land use disputes among herders, and between herders and crop farmers. Most herders have their own winter shelter and spring grazing area, even if these are not always formally registered, and so, many do not pay land use fees. This means that there is less funding available to be reinvested into environmental improvements (regulation requires 15% of land use fees are spent on environmental improvements). A related theme is that more than half of all surveyed households do not hold possession certificates for use of pastureland. With respect to water resources, household water availability is not currently a major concern, although the potential impact of mining on water resource availability and quality are key issues. This indicates that water pollution is increasingly likely to become a key community concern particularly in Tunkhel *bagh*, regardless of any actual impacts.

When the Socio-economic Baseline Study was conducted in March-April 2015, 60% of Mandal *soum* households or 4,228 family members were involved in Artisanal and Small-scale Mining (ASM) – to



supplement their incomes / livelihoods, as a hobby, or as a poverty reduction strategy. Around 228 soum residents were members of the 30 officially registered ASM cooperatives (3 big NGOs, with around 30 to 100 members and 27 small cooperatives with 3 - 10 members). The ASM context changed significantly from when the Socio-Economic Baseline Study was conducted, when beginning in September 2015 over 5,000 miners were recorded conducting trespass and illegal mining at the Gatsuurt Project site. These miners gained access to the site in large vehicle convoys and overcoming safety and environmental measures in place at the site. As a result of this activity, Centerra in cooperation with the local authorities undertook some 28 operations to safely remove miners off the site. Centerra also conducted additional analysis of the context and impacts of this ASM activity and proposed additional company commitments to effectively manage the issue.

Community Health, Safety and Security

There is a lack of health care personnel (doctors and nurses) in the Project area. Key problems households are experiencing with health services include the poor quality of health care; no time to go to the hospital; and, that hospitals are too far away. Infectious diseases have increased in the Project area since 2014, the most common of which are Sexually Transmitted Infections. Selenge *aimag* has the highest rate of TB in Mongolia, which may be explained by the significant number of artisanal and small-scale miners, many of whom work underground in confined spaces, thereby facilitating transmission from infected persons to others of vulnerable health status.

The main causes of traffic accidents in the Project area are related to risky driving practices. Specifically, in Bayangol these include driving on the wrong side of the road and speeding, and in Mandal, drunk driving, speeding and failure to stop vehicles in slippery conditions. Moreover, police statistics indicate that the major crimes in Selenge *aimag* are related to traffic safety and the use of motor vehicles. These risky driving practices present the greatest public health risk from the Project once the use of haul trucks on the Gatsuurt road commences. Indicative traffic surveying shows the majority of vehicles travelling along the Gatsuurt haul road are light vehicles, and thus there is the potential for collisions with haul trucks. Related to this is that alcohol is a key influence on crime in Project area, including driving while intoxicated. According to 2015 police data, 33% of total registered crimes were committed under the influence of alcohol in Selenge *aimag*. Domestic violence against women is perceived to be higher in Tunkhel *bagh* compared with other places surveyed. Indeed, the Mandal *soum* crime profile suggests the majority are committed against women, with alcohol involved. Child labour was also reported by over 30% of respondents as a key issue in Bayangol *soum*, compared to slightly over 20% in Mandal *soum*. Child labour most often takes the forms of herding, artisanal mining or working for forestry companies.

Cultural Heritage

Respondents in the Project area report only moderate engagement with local cultural heritage objects and practices. On average, the majority of baseline survey respondents indicated that they do not receive any benefit at all from cultural heritage. Worship of Noyon *uul* (mountain), located immediately north of the Project area as shown in Fig.2.3, is a traditional heritage practice in the Project area. According to households in the Project area, worship of the mountain occurred before the Socialist era, but was then forbidden during communist rule (1920s to 1990s). The idea of worshipping the mountain once again was initiated during the transition period in the 1990s. The *Ethnographic Report of the Intangible Cultural Heritage in the Region of Gatsuurt Mining Area* (conducted by The Mongolian Academy of Sciences Institute of History and Archaeology as part of the Socio-economic Baseline



Studies) found that worship rituals performed at Noyon Mountain are flexible, and have been performed at various different places near and on the mountain. Shamans also use the area to worship several times a year.

The nearest artefact and heritage sites to the Gatsuurt Mine Licence Area are mostly centred in two Locally Protected Areas: Zuun Modnii Gol and Noyon Uul sites (this Noyon Uul is not the same as the mountain located immediately north of the Gatsuurt Project Area but is a site located is 7km away and has the same name) which contain the Sujikhtai Hunuu Graves site. A site of national importance, the Sujikhtai Hunnu Graves site is located 7km from the Gatsuurt mine and outside any potential influence from blasting or vibration impacts. The Gatsuurt road, which existed as a public road prior to the Project being developed, passes through two Locally Protected Areas - Zuun Modnii gol and Noyon Uul (see Figure 2.3 which shows in further detail the boundaries of the Mine Licence Area, the Gatsuurt mine site and the road in relation to Noyon Uul).

Five (5) tangible heritage sites from the Mongol Era (12th-18th century) (see Figure 2.3) were recorded in a recent (2015) archaeological study conducted by the Mongolian Academy of Sciences in the Gatsuurt Mine License Area. These sites have not been recommended by Mongolian Academy of Sciences for further investigation.

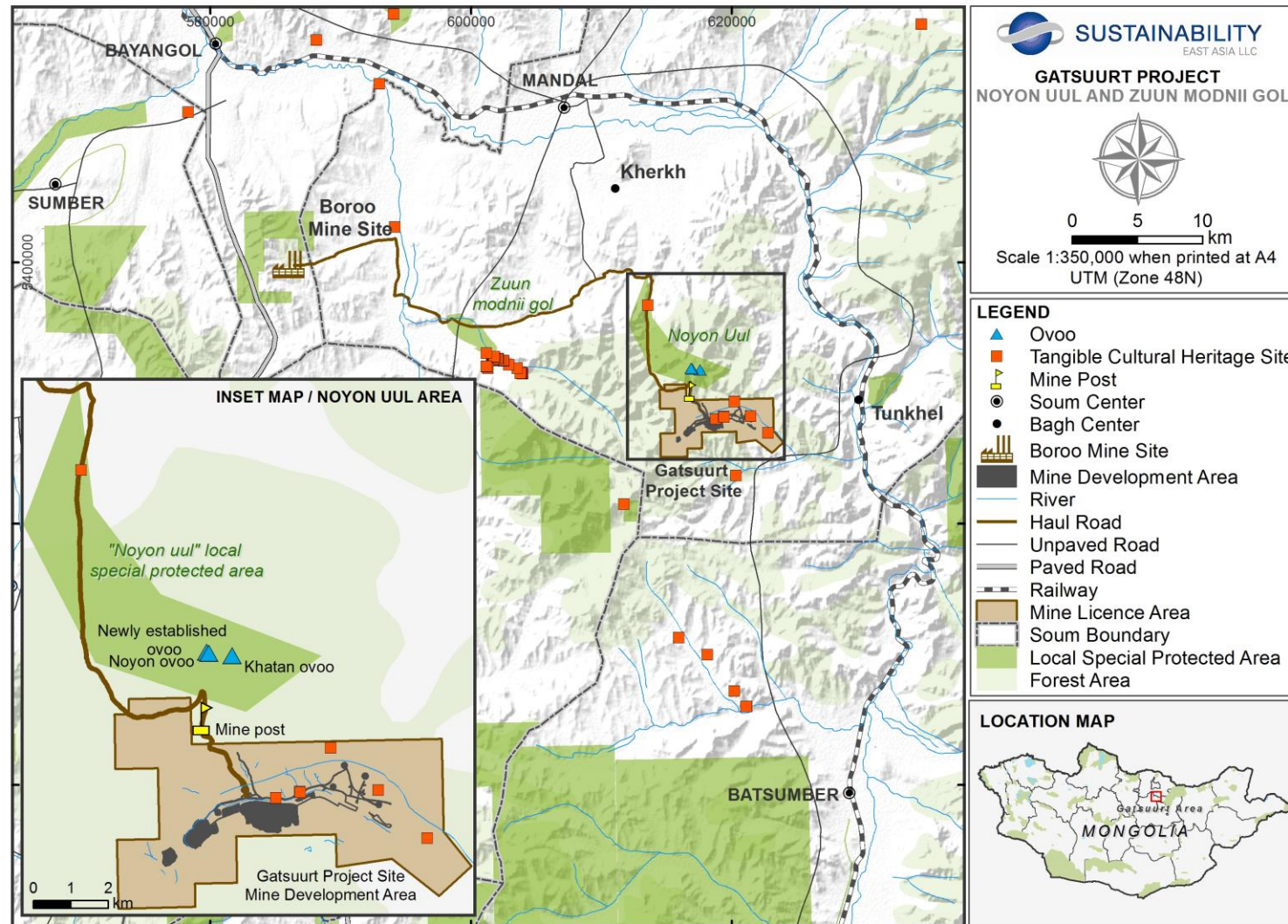


Figure 2.3 Map Showing Key Cultural Heritage Sites in Relation to the Gatsuurt Mine Site, Mine Licence Area, and Public Road



3.6.2 Impacts and Management

A Social Impact Assessment (SIA) was undertaken to assess the impacts associated with the construction, operation and closure of the Gatsuurt Project, and develop and propose mitigation to be implemented by the Project. In this way, impacts can be prevented, reduced or maintained to an acceptable level, and the positive impacts can be further enhanced, including through meaningful participation from interested stakeholders.

The areas of possible impact that presented the greatest risk to the Project and its social interactions and social performance were determined following scoping and impact assessment. Mitigation measures have been proposed to respond to all of the identified potential impacts, combining a combination of management controls (such as the development and implementation of a Management Plan, and internal procedures), engineering controls (such as signage and passing lanes on the road), and engagement with stakeholders (to inform, enable participation and collaboration to design and deliver joint solutions). Opportunities for enhancement of beneficial impacts are also available, including strengthening delivery of sustainable community development initiatives in the area of influence of the Project. Those impacts with the greatest risk, and the control, mitigation and enhancement measures thereof are presented below.

- **Potential Impact:** Risk of unmet community expectations for jobs due to lack of suitable candidates.

Proposed Control, Mitigation and Enhancement Measures: Centerra will define and implement local hiring preference policy through its Management Plans and ensure eligibility for 'local hiring preference' through a specific timeframe of residency in the Project Area of Influence. The Company proposes to communicate employment estimates, timeframes and skills requirements clearly to the community on a continuous basis through Community Relations Officers (CROs). Centerra will also invest in skills training to facilitate employment of the local population through cooperation with training partners, to supplement on-the-job training. Further, the Company will engage with training providers on types of skills needed and timeframes to support skills requirements of the Project. Centerra will consider current / former Boroo staff in supervisory roles (as appropriate), including for training of new employees

- **Potential Impact:** Increased risk to workers of accident, injury or fatality in working on a new mine site.

Proposed Control, Mitigation and Enhancement Measures: Centerra proposes to implement the existing relevant measures from the Boroo project to the Gatsuurt Project, including ensuring that all staff and contractors are familiar with the site (day and night conditions), provision of induction, training and supervision in the first months of employment, for both staff and contractors. Risk assessments for new tasks, systems of work and plant will be conducted, including a focus on new materials and training for the BIOX facility. Contractors will be required to have a minimum level of OHS competency through the contract duration, and contractors will be subject to prequalification / screening processes prior to commencement, and performance monitoring throughout the contract. An emergency response plan and a BGC mine rescue team with ongoing training will be implemented.



- **Potential Impact:** Risk of unplanned emergency events impacting workers, emergency responders, Government agencies and communities in the Project area.

Proposed Control, Mitigation and Enhancement Measures: Centerra will implement the existing relevant measures from the Boroo project to the Gatsuurt Project, including customising the existing Centerra Crisis Management Plan and Emergency Response Plan for the Gatsuurt Project. The Company will undertake engagement with emergency response organisations on emergency response issues. Centerra will also continue application of the International Cyanide Management Code for the manufacture, transport and use of cyanide to ensure good international industry standards are applied and maintained in how the company procures, transports, stores, uses, disposes of cyanide. BGC also works with the local disaster agency in any applicable incidents that may occur.

- **Potential Impact:** Threats to human health and safety of communities from access to mining facilities at Gatsuurt or processing facilities at Boroo.

Proposed Control, Mitigation and Enhancement Measures: Centerra proposes implementing the existing relevant measures from the Boroo Project to Gatsuurt, including excluding the public from active mining areas to minimise the impacts of blasting and dangers of heavy equipment activities. This will be done by using security personnel to ensure no unauthorized public access to these areas; the use of signage at all entrance/exist points and periodically on boundaries/fenced areas; regular stakeholder engagement program to notify of key safety issues on, around and offsite; and an outreach program to periodically bring visitors for site visits in a controlled and safe manner.

As mentioned above, the ASM context changed rapidly after the Socio-economic Baseline Studies were conducted. In order to effectively address the emergence of this form of ASM, which manifested as trespass and illegal mining, Centerra has committed to remain non-confrontational and fully align with the *Voluntary Principles on Security and Human Rights*¹. Further the Company has tried to improve security around the site Gatsuurt site, including implementing a Mutual Assistance Agreement with the Mongolian Police and specific internal security protocols. Moving forward the Company is committed to developing a Strategic Action Plan with key partners and other Mongolian stakeholders to effectively address the issue of ASM.

- **Potential Impact:** Risk of road accidents, incidents or fatalities on the public road between Gatsuurt and Boroo site, between Project and public road users.

Proposed Control, Mitigation and Enhancement Measures: Centerra proposes to develop and implement a Traffic Management Plan, effective for direct and indirect employees, which provides strategies to manage vehicle and equipment travel on the road during all phases of the Project.

The potential for speed-related accidents / interactions between Project and public traffic will be mitigated by retaining the gravel road for the duration of the Project, including:

¹ The Voluntary Principles on Security and Human Rights are a set of principles designed to guide companies in maintaining the safety and security of their operations within an operating framework that encourages respect for human rights.



- Maintenance of the existing road as per the existing soum-level agreement. The local government shares responsibility for maintenance of the Gatsuurt haul road by virtue of a formal agreement, however Centerra conducts all maintenance work on the road.

Setting aside funds by the Centerra to upgrade and modify the road on completion of the Project for public use only, should this be agreed with relevant authorities as part of Mine Closure Planning. Centerra will design and implement specific road engineering controls to minimise the potential for incidents, including:

- Construction and establishment of safe passing places / pull over areas with appropriate signage to enable Project traffic to pull over while local traffic can pass safely without facing oncoming vehicles; and
- Engineering controls to prevent passing on blind corners/crests.
- Dust control program.

Centerra proposed to implement the existing Boroo controls in place for drivers to minimise the potential for incidents, including:

- Speed control / limits by vehicle type / time of day / driving conditions;
- Boroo Drug and Alcohol Policy;
- Driver training and assessment;
- Driver identification / clear vehicle numbers for easy identification by other road users;
- Penalties for verified incidents of any poor driving / speeding;
- Personal protective equipment for drivers;
- Haulage scheduling to minimise potential interactions with public vehicles (including, avoiding a haul schedule at peak public vehicle use times or westbound at sunset); and
- Truck controls of covering loads (no unsecure loads) to prevent loose rocks from haul trucks from falling off and hitting cars.

Apply reasonable efforts to work with the Government of Mongolia to minimise potential incidents:

- Establishment and enforcement of speed limits;
- Conduct vehicle spot checks for safety;
- Enforcement of blood alcohol limits;
- Development and training of vehicle emergency incident response including roles and responsibilities;

Engagement with the community to minimise potential incidents:

- Develop and deliver road safety campaigns with relevant partner organisations, highlighting speed limits, safety belts, and vehicle maintenance; particular campaign actions should also target vulnerable groups such as elderly drivers and children;



- Provide advance public notification of the schedule haulage times, frequency and road risks to road users, using television as the preferred medium of communications as well as newspapers and CROs, as documented in the Stakeholder Engagement Plan; notification will be provided prior to commencement of haulage;
- Provide notification of the Grievance Mechanism should any nuisance issues or complaints against particular drivers arise;
- Provide notification of emergency services details (including on the roadside as well as through media) in the event of minor or major accidents with people, other vehicles or livestock; and
- It should be noted that mitigation for interactions with livestock on the public road are the same as the above for people and/ or other vehicles.

The impact of the Gatsuurt Project on Noyon Mountain worshipping and on the Sujikhtai Hunuu Graves at Noyon Uul was raised by interested parties throughout the impact assessment process, however the impact assessment process and studies conducted showed that the Project poses little risk to either Noyon Mountain worshipping or the graves. Further the building of the Gatsuurt road, a public road, has also provided greater accessibility to the mountain for worship purposes. There are two known areas used for worshipping near the public road. The first is a longstanding site, access to which has been made more convenient through construction of the road. The second site was facilitated by the road construction (i.e. it was not associated with worship rituals prior to the road being developed). From an impact perspective therefore, the Gatsuurt Project has no negative impact on Noyon Mountain worshipping. The same is also true for the Sujikhtai Hunnu Graves, which are located 7km away from the mine, and outside of any potential influence.

From a management perspective, the Gatsuurt Project will continue to work with interested parties, and stakeholders to proactively manage any concerns about access to and impacts on Noyon Mountain worship practices and the Sujikhtai Hunnu Graves through the Stakeholder Engagement Plan and Grievance Mechanism. Centerra will also collaborate with soum governments and community groups to support local cultural events and conserve and reinforce local traditions and culture. Further, a strict Code of Conduct will be implemented for all employees, including prohibiting interference with cultural heritage sites by employees and contractors. In relation to the sites identified in the Gatsuurt Mine Licence Area in 2015, these are not planned to be disturbed by the Project and should any potential disturbance be required, Centerra will consult with the Mongolian Academy of Sciences Institute of Archaeology. The Company also adheres to a chance find policy on cultural, heritage and ancient artefacts or sites whereby the preservation in the best interest of all is taken into consideration.



3.7 CUMULATIVE AND TRANSBOUNDARY IMPACTS

Development of the Gatsuurt Project suggests that there will be both positive and negative cumulative effects in the Project area of influence, which link strongly to existing challenges in the area. These include providing sufficient infrastructure services for what is an already changing population profile and social services that meet their changing needs; facilitating economic opportunities for the existing under- and unemployed population, particularly of young men with lower levels of education compared to women, and a general preference for self-employment rather than taking up salaried positions. Baseline data shows that the Mandal population is becoming increasingly urbanised, which puts pressure on the social infrastructure and services for its citizens. The Project area offers an existing and diverse range of businesses for seeking potential partnerships and benefits to enhance economic opportunities. There are 208 other industries in Mandal and 80 other businesses in Bayangol (i.e. other than Centerra). There are commercial exploration and mining activities in the aimag (e.g. in coal, iron ore), and physical environment of Selenge lends itself to further economic investment, as the area has proximity to markets by road and rail, good water supply and a large population in the economically active age category.

The Project will work closely with the Bayangol and Mandal soum governments to ensure that in- and out-migration is monitored effectively, and that cumulative impacts, such as safety impacts of use of the public road, are managed jointly. The Project is likely to contribute positively to local economic development through employment and procurement, improve local employment opportunities, and increase the human capital of the area.



4. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING

4.1 MANAGEMENT PLANS

Management of significant Project environmental and social aspects and impacts is through a suite of Management Plans that have been developed as part of the EISA Disclosure Package and which will be implemented prior to construction activities. The following Management Plans have been developed to a framework status and outline the expected Project performance.

4.1.1 Environment

- Biodiversity Management Plan;
- Water Management Plan;
- Acid Rock Drainage Management Plan;
- Hazardous Materials Management Plan; and
- Transport Management Plan.
- A mine closure/reclamation plan has also been developed and forms part of the Gatsuurt EIA document.

4.1.2 Social

- Stakeholder Engagement and Grievance Management.
- Social Management Plan

4.2 ENVIRONMENTAL AND SOCIAL ACTION PLAN

An Environmental and Social Action Plan (ESAP) has been drafted to ensure that identified gaps in environmental and social performance are managed, and that the Project can be developed and operated to meet the EBRD PRs for the duration of the Project. The ESAP has been developed as a result of a detailed environmental and social review of the Gatsuurt Project documentation.