12.0 SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT PLAN

12.1 BACKGROUND

Treasury is committed to responsible stewardship of the environment. Treasury's goal is to minimize environmental impact, conduct efficient use of the resources we consume, and conserve natural resources for future generations. As stated with the Environmental Core Policy (Appendix Z) Treasury's commitment is to:

- Manage our operations to minimize or eliminate impacts on the environment through use of best management practices and appropriate application of technology;
- Adopt and promote policies specific to protecting the environment;
- Implement measures to ensure the efficient use of resources, energy and materials to minimize environmental impacts through all phases of the operation;
- Ensure compliance with all environmental legislation and regulations;
- Set objectives and put processes in place to continually improve our environmental performance; and
- Curtail operation if necessary to prevent or resolve environmental non-compliance conditions.

As per the Federal EIS guidelines, the EA will outline the conceptual environmental monitoring programs developed though the EA process, through all phases of the Project.

This section provides a framework for components to be included within the environmental monitoring program. Further monitoring details will be developed through on-going stakeholder consultation during the EA process, and through conditions placed on regulatory instrument such as permits, authorizations and approvals issued by the Federal and Provincial regulatory agencies. The Province will issue the bulk of these authorizations and permits.

Treasury will be responsible to carry out the environmental monitoring program and that the involved Federal and Provincial agencies and authorities will be responsible for ensuring implementation of the environmental monitoring program, with input from Aboriginal and public stakeholders. The environmental monitoring program will be reviewed to determine its effectiveness and if changes are required.

12.2 OBJECTIVES AND CONTEXT

Environmental monitoring programs are created to ensure the Project is being carried out in compliance with existing legislation, best practices, and compliance with Federal and Provincial guidelines. In addition, the environmental monitoring program is to ensure that the Project complies with Treasury's core environmental policy. The environmental monitoring program will ensure that the measures implemented to mitigate environmental and social effects are successful and that benefits from the Project are enhanced.

Environmental monitoring program implementation will occur over all phases of the Project (site preparation, construction, operations, closure, and post-closure). Enactment of the environmental monitoring program will allow for compliance of all development phases with permit and approval requirements, while providing information of the effectiveness of mitigation strategies and measures. Environmental monitoring programs will provide for progressive or adaptive management should effects vary from that predicted, mitigation methods are less effective than anticipated, or new information becomes available. As per Treasury's commitments, a precautionary approach will be used to ensure Treasury meets all applicable regulatory and Company requirements.

The conceptual environmental monitoring program included within the EA will be developed into a stand-alone document as the Project is defined in further details. The environmental monitoring program will be finalized as the Project moves into construction and operations.

12.3 REPORTING

All monitoring programs associated with the Project will be under the supervision of Treasury and the site environmental manager. All reporting will be subject to applicable conditions as set within permits, approvals, and Federal and Provincial guidelines and mechanisms. All reporting results will be provided to the relevant Federal and Provincial agencies and authorities. Monitoring report results upon approval by relevant Federal and Provincial agencies and authorities will be provided to Aboriginal groups and stakeholders if requested.

12.4 MONITORING MEASURES AND PLANS

Monitoring plans and measures proposed for the Project are outlined for applicable disciplines as defined by physical, biological, and human environments as defined through the effects prediction presented within the EA (Section 6.0), and current industry best practices.

The conceptual environmental monitoring program includes monitoring discipline, parameter, standard, and location and is summarized in tables 12.4.1, 12.4.2, and 12.4.3 for the physical, biological and human environments, respectively. Monitoring frameworks and monitoring networks will be established from existing baseline monitoring, although modification will occur to satisfy compliance and reporting requirements.

Treasury will design the environmental monitoring program to monitor the implementation of any mitigation measures resulting from Aboriginal consultation though the EA process, including:

- Verifying predictions of environmental effects with respect to Aboriginal peoples, as well as residual impacts that could not be addressed within the context of the EA;
- Determining the effectiveness of mitigation measures as they relate to environmental effects with respect to Aboriginal peoples in order to modify or implement new measures where required;
- Supporting the implementation of adaptive management measures to address previously unanticipated adverse environmental effects with respect to Aboriginal peoples or unanticipated adverse impacts to Aboriginal rights;
- Verifying measures identified to prevent and mitigate potential adverse effects of the Project on potential or established Aboriginal and Treaty rights; and
- Providing information that can be used to improve and/or support future EAs and Aboriginal consultation processes.

Finalization of the detailed environmental monitoring program will occur though consultation with Aboriginal communities, public stakeholders and Federal and Provincial governments. Industry standards, regulations, current legislation and legislative guides will be used to develop and finalize the components of the detailed environmental monitoring program. Frequency and timelines for monitoring will be finalized though this phase. Information presented within the detailed environmental monitoring program will be consistent with information presented within this section.

Table 12.4.1 Proposed Physical Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Air Quality	Total Suspended Particulates (TSP)	High volume samplers	Ontario Reg. 419/05 air quality standard for TSP	Construction → Operations	Location will be finalized based on predicted contaminants of concern (COC) levels, and consultation with appropriate government regulators.
Air Quality	Metals	Analysis of high volume samplers TSP samples collected (filter)	Ontario Reg. 419/05 air quality standard for metals	Construction → Operations	Location will be finalized based on predicted COC levels, and consultation with appropriate government regulators.
Air Quality	NOx/SO_2	Passive samplers	Levels to be screened and follow Ontario Ambient Air Quality Criteria (OAAQC)	Construction → Operations	Location will be finalized based on predicted COC levels, and consultation with appropriate government regulators.
Noise and Vibration	A-weighted decibels (dBA), construction noise	Noise monitor	NPC-103, NPC-232	Construction → Closure	When construction is within the 1km range of any sensitive noise receptor defined within the study area. The closest receptor to the construction activity can be taken as the representative location for monitoring.

Table 12.4.1 Proposed Physical Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Noise and Vibration	A-weighted decibels (dBA), operations noise	Noise monitor	NPC-103, NPC-232	Construction → Closure	Sensitive receptors will be determined within the study area based on the operations at that time
Noise and Vibration	Decibels (dB), construction or operational blasting noise	Noise monitor	NPC-103, NPC-119, NPC-232	Construction → Closure	Sensitive receptors will be determined within the study area based on the blasting at that time
Noise and Vibration	Vibration Levels (PPV), construction or operational vibration	Vibration monitor	NPC-103, NPC-119	Construction → Operations	Sensitive receptors will be determined within the study area based on the blasting at that time
Geochemistry	ABA and ICP metals scan – mine rock	Blast hole sampling	Mine Environmental Neutral Drainage (MEND) 2009 Prediction Manual for Drainage Chemistry from Sulphuric Geologic Materials Natural Resources Canada	Operations	Selected cutting from mine rock blasts

Table 12.4.1 Proposed Physical Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Water Quality	Surface water quality samples will be tested for various general chemistry, metals and organic material. Additional parameters will be considered depending on specific site characteristics.	Surface water sample collection, in-field filtration and preservation as required by laboratory. QA/QC controls such as blanks and duplicates will be completed during each sampling round.	Provincial Water Quality Objectives (PWQO) and Canadian Water Quality Guidelines (CWQG) Metal Mining Effluent Regulations (MMER) and Ontario Reg. 560/94	Pre-development → Post-closure	Project site components: collection ponds, seepage ponds, polishing pond. Surface water receivers: Wabigoon Lake, Thunder Lake, Blackwater Creek, Little Creek, Hoffstrom's Bay Creek, Thunder Lake Tributaries.
Water Quality	Groundwater quality samples will be tested for various general chemistry, metals and organic material. Additional parameters will be considered depending on specific site characteristics.	Groundwater sample collection using mechanical or hand pumping techniques, in-field filtration and preservation as required by laboratory. QA/QC controls such as blanks and duplicates will be completed during each sampling round.	Provincial Water Quality Objectives (PWQO) and Canadian Water Quality Guidelines (CWQG) Ontario Drinking Water Standards (ODWS) Metal Mining Effluent Regulations (MMER) and Ontario Reg. 560/94	Pre-development → Post-closure	Groundwater monitoring wells to be determined around Project site
Hydrology and Climate	Meteorological parameters that include: air temperature, relative humidity, wind speed, wind direction, solar radiation and total precipitation	Meteorological sampling equipment located on 10 m tower on-site.	Environment Canada (1992) Atmospheric Environment Service (AES) Guidelines for Co-operative Climatological Autostations	Pre-development → Post-closure	Continue at current location

Table 12.4.1 Proposed Physical Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Hydrology and Climate	In-stream characteristics	TSP sampling; Measurement of stream cross sections for channel geometry. Measure of sediment erosion/accumulation using erosion pins/disturbance rods.	Industry Best Practice	Construction → Closure	The reach of Blackwater Creek, the reach of Thunder Lake Tributary
Hydrology and Climate	Water usage from freshwater sources	Flow meter capable of recording instantaneous and total daily volume.	Ontario Water Resources Act (Section 34)	Operations	Tree Nursery Ponds or other freshwater source
Hydrology and Climate	Discharge to the environment	Flow meter capable of recording instantaneous and total daily volume.	Ontario Water Resources Act (Section 53)	Operations	Effluent treatment facility outlet
Hydrology and Climate	Water transfer	Flow meter capable of recording instantaneous and total daily volume.	Industry Best Practice	Operations	Water monitoring locations to be determined around Project site
Hydrogeology	Groundwater levels around the open pit	Monitoring wells with data loggers to obtain continuous records of groundwater levels along with quarterly manual depth to groundwater measurements.	Industry Best Practice	Construction → Closure	Deep groundwater monitoring wells at specific locations around the perimeter of the open pit

Table 12.4.1 Proposed Physical Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Hydrogeology	Groundwater levels around the various mining locations and stockpile	Monitoring wells with data loggers to obtain continuous records of groundwater levels along with quarterly manual depth to groundwater measurements.	Industry Best Practice	Construction → Closure	Numerous locations around mine site and stockpiles
Hydrogeology	Groundwater levels in the vicinity of surface water features to access interactions between groundwater and surface water	Monitoring wells with data loggers to obtain continuous records of groundwater levels along with quarterly manual depth to groundwater measurements.	Industry Best Practice	Construction → Closure	Monitoring locations to be adjacent to select hydrological stations

Table 12.4.2 Proposed Biological Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Aquatic Biology	Water – TSS and turbidity	Standard methods and handheld meter.	1mg/L TSS and 1 Nephelometric Turbidity Unit (NTU)	Construction	Downstream of active construction areas
Aquatic Biology	Water – metals, pH, nutrients, hardness, dissolved organic carbon alkalinity	Inductively Coupled Plasma Mass Spectrometry (ICP-MS).	(MDL<CCME standards)	Construction → Closure	Locations downstream of Project discharge and referenced areas
Aquatic Biology	Sediment – metals, total organic grain size	Surficial sediment collected from grab or core sample.	Environmental Effects Monitoring (EEM) under MMER and Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (COA) requirements under Ontario Water Resources Act (OWRA)	Operations → Closure	Locations downstream of Project discharge and referenced areas
Aquatic Biology	Benthic invertebrate community	Depositional sampling using ponar, identified to lowest practical level.	Environmental Effects Monitoring (EEM) under MMER and Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (COA) requirements under Ontario Water Resources Act (OWRA)	Operations → Closure	Locations downstream of Project discharge and referenced areas

Table 12.4.2 Proposed Biological Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Aquatic Biology	Fish community	Collection of fish using standard collection methods, or as prescribed by OMNRF. Identification and enumerate and determine relative abundance.	Environmental Effects Monitoring (EEM) under MMER and Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (COA) requirements under Ontario Water Resources Act (OWRA)	Operations → Closure	Locations downstream of Project discharge and referenced areas, and habitats affected by watercourse realignments
Aquatic Biology	Fish health	Two sentinel species using either a non-destructive or lethal study (measuring for length, weight, age, live weight, gonad weight, egg size, and fecundity). Measures all abnormalities on all fish collected.	Environmental Effects Monitoring (EEM) under MMER and Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (COA) requirements under Ontario Water Resources Act (OWRA)	Operations → Closure	Locations downstream of Project discharge and referenced areas
Aquatic Biology	Fish tissue	Boneless, skinless filet from adult sport fish measured for total mercury.	Cold Vapor Atomic Absorption Spectrophotometry (CVAAS), while tissue metal analysis performed by ICP-MS	Operations → Closure	Areas affected by stream realignments and referenced areas
Terrestrial Biology	Wildlife – Project interactions (i.e., removal or deterrent actions, injury and or mortality)	Site surveillance monitoring (identification of species, number, location of wildlife interaction, and risks to wildlife).	N/A	Construction → Closure	Project site

Table 12.4.3 Proposed Socio-economic Monitoring Parameters, Standards, and Locations

Discipline	Parameter	Monitoring Method	Standard	Time Period	Location
Socio-Economic	Number, skill sets and positions held by local or First Nation and Métis personal and contractors at the Project site	Database maintained by Treasury Metals Human Resources department or others as required.	N/A	Construction → Closure	N/A
Socio-Economic	Number of employees moving into the regional communities from outside the region	Database maintained by Treasury Metals Human Resources department or others as required.	N/A	Construction → Closure	N/A
Socio-Economic	Number of local employees successfully transitioning to new employment after closure	Database maintained by Treasury Metals Human Resources department or others as required.	N/A	Construction → Closure	N/A
Socio-Economic	Number of local or First Nation and Métis hired to decommissioning and closure contracts	Database maintained by Treasury Metals Human Resources department or others as required.	N/A	Construction → Closure	N/A

12.5 OCCUPATIONAL HEALTH AND SAFETY PLAN (OHSP)

Treasury will continue to develop the OHSP. Treasury is committed to protecting the health and safety of all employees. Safety is a core value and is the highest priority on all activities we undertake. Treasury is committed to caring for all employees, providing safe working conditions, equipment and work sites. Treasury will continue to strive to support employee involvement in identifying, preventing and eliminating hazards and risks to injury.

The current OHSP outlines objecting and expectation of all employees of Treasury:

- All injuries are preventable;
- Every task can be performed without injury;
- All employees are responsible and accountable for their personal safety;
- Treasury is committed to achieving full compliance with all applicable legal requirement and Company standards;
- Promote and develop strong leadership, safe behaviours and personal accountability in health and safety through employee involvement in continuous improvement processes;
- Maintain a workplace free of the effects of alcohol and other drugs of abuse;
- Promote health and safety at work, at home and within our communities; and
- Recognize, reward and support excellent safety performance.

The OHSP will address all components of the Project and will be developed to conform to the requirements of the *Occupation Health and Safety Act*, Regulation 854 – Mines and Mining Plants. Current procedures and policies in place at Treasury can be referenced within Appendix Z.