



**Mackenzie Valley Land and Water Board**  
**7th Floor - 4922 48th Street**  
**P.O. Box 2130**  
**YELLOWKNIFE NT X1A 2P6**  
**Phone (867) 669-0506**  
**FAX (867) 873-6610**

October 8, 2019

File: MV2019X0007  
MV2007L8-0031

Ms. Natalie Plato  
Crown-Indigenous Relations and Northern Affairs Canada  
PO Box 1500  
Yellowknife NT X1A 2R3

Email: Natalie.Plato@canada.ca

Dear Ms. Plato:

**Preliminary Screening Determination**  
**Giant Mine Remediation Project – Giant Mine Site, Yellowknife, NT**

The Mackenzie Valley Land and Water Board (the Board) met on September 25, 2019 to conduct a preliminary screening of your April 2019 Post-EA Information Package for Water Licence MV2007L8-0031 and Land Use Permit (Permit) Application MV2019X0007.

The Mackenzie Valley Environmental Impact Review Board released its Report of Environmental Assessment (EA) for the Project on June 20, 2013. The Board notes changes were made to the scope of development as outlined in the EA, including:

- Remediate open pits by backfilling (fully or partially) with clean borrow material sourced and produced on site, or with contaminated material and a layer of clean borrow material placed over the contaminated material;
- Partially excavate Shoreline Lands including shoreline soils and near-shore sediments along the townsite area, to the foreshore tailings cover;
- Implement a remedial strategy for contaminated soils that includes fencing forested terrain, wetlands, and bedrock areas of the remediation site impacted by roaster emission fallout that has contaminated surficial materials, but does not include remediating all contaminated soils across the site to industrial standards;
- Relocate tailings in South Pond and consolidate in North and Central Ponds;
- Dispose of spent ion exchange adsorptive media in the on-site landfill;
- Quarry on site for required rock borrow material;
- Install a freshwater intake in Yellowknife Bay; and
- Construct a long-term underground access.

As such, the Board conducted a preliminary screening on the above components of the Project. The Board is satisfied that Preliminary Screening of the April 2019 Post-EA Information Package and Permit Application has been completed in accordance with section 125 of the *Mackenzie Valley Resource Management Act*. The Preliminary Screening Report and the Board's Reasons for Decision are attached.

.../2

If you have any questions or concerns, please contact Kimberley Murray at (867) 766-7458 or email [kmurray@mvlwb.com](mailto:kmurray@mvlwb.com).

Yours sincerely,



Mavis Cli-Michaud  
MVLWB, Chair

Copied to: Distribution List

Attached: Preliminary Screening Report – September 25, 2019  
Reasons for Decision

**Preliminary Screening Report Form**

<p><b>Preliminary screener:</b> MVLWB</p> <p><b>Reference / File number:</b> MV2007L8-0031, MV2019X0007</p> <p><b>TITLE:</b> Giant Mine Remediation Project</p> <p><b>ORGANIZATION:</b> DIAND – GIANT</p> <p><b>MEETING DATE:</b> September 25, 2019</p>	<p><b>EIRB Reference number:</b> <u>EA0809-001</u></p>
--	--

**Type of Development:**  
(CHECK ALL THAT APPLY)

- New
- Amend, EIRB Ref. # EA0809-001
- Requires permit, licence, or authorization
- Does not require permit, licence, or authorization

**Project Summary:**

Water Licence MV2007L8-0031 was referred to Environmental Assessment on March 31, 2008. The Mackenzie Valley Environmental Impact Review Board (MVEIRB) released its Report of Environmental Assessment and Reasons for Decision (EA 0809-001) on June 20, 2013 and the Minister of Indian and Northern Affairs Canada (INAC) provided approval of EA 0809-001 with modified measures on August 11, 2014. A Post-EA Information Package and Land Use Permit Application (the Project) was submitted to the Mackenzie Valley Land and Water Board (MVLWB) on April 1, 2019. Since the EA some Project components have changed and require screening.

**Scope:**

Closure and Remediation activities and long-term site management, including engineering investigations and monitoring, for implementation of the Giant Mine Remediation Project (GMRP), on the abandoned Giant Mine Site, located within the municipal boundary of the City of Yellowknife, Northwest Territories.

The scope of the Project is described in the Post-EA Information Package submitted on April 1, 2019, and the additional information submitted during the regulatory process. The ten main components of the GMRP include: underground mine workings; freeze program; open pits and mine workings; contaminated soils and sediment; Baker Creek; Water Treatment Plant; Tailings Containment Areas; borrow material; buildings and site infrastructure; and non-hazardous waste landfill. Project components that have changed since the EA and need to be screened were determined through documents submitted through the regulatory process, the public review, and technical sessions.

The scope of the Project components that have changed since EA 0809-00 and are applicable to this screening includes the following:

- Remediate open pits by backfilling (fully or partially) with clean borrow material sourced and produced on site, or with contaminated material and a layer of clean borrow material placed over the contaminated material;
- Partially excavate Shoreline Lands including shoreline soils and near-shore sediments along the townsite area, to the foreshore tailings cover;
- Implement a remedial strategy for contaminated soils that includes fencing forested terrain, wetlands, and bedrock areas of the remediation site impacted by roaster emission fallout that has contaminated surficial materials, but does not include remediating all contaminated soils across the site to industrial standards;
- Relocate tailings in South Pond and consolidate in North and Central Ponds;
- Dispose of spent ion exchange adsorptive media in the on-site landfill;
- Quarry on site for required rock borrow material;
- Install a freshwater intake in Yellowknife Bay; and
- Construct a long-term underground access.

**Land Use Eligibility - Section 18 Mackenzie Valley Land Use Regulations:**

18(b)

**Type of Disposition**                      **Disposition Number(s)**

- Mineral Claims
- Prospecting Permit (s)
- Mineral Leases
- Oil and Gas: EL/SDL/PL

- Quarry Permit
- Timber Permit
- Other:

Reserve R662T

**Principal Activities (related to scoping) (CHECK ALL THAT APPLY)**

- |  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Exploration       | <input checked="" type="checkbox"/> Decommissioning |
| <input checked="" type="checkbox"/> Installation | <input type="checkbox"/> Industrial        | <input checked="" type="checkbox"/> Abandonment     |
| <input checked="" type="checkbox"/> Maintenance  | <input type="checkbox"/> Recreation        | <input type="checkbox"/> Aerial                     |
| <input type="checkbox"/> Expansion               | <input type="checkbox"/> Municipal         | <input type="checkbox"/> Harvesting                 |
| <input type="checkbox"/> Operation               | <input checked="" type="checkbox"/> Quarry | <input type="checkbox"/> Camp                       |
| <input type="checkbox"/> Repair                  | <input type="checkbox"/> Linear / Corridor | <input checked="" type="checkbox"/> Scientific/     |
| <input type="checkbox"/> Research                | <input type="checkbox"/> Sewage            | <input checked="" type="checkbox"/> Solid Waste     |
| <input checked="" type="checkbox"/> Water Intake |  |   |
| <input type="checkbox"/> Other:                  |  |   |

**Principal Development Components (related to scoping) (CHECK ALL THAT APPLY)**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Access Road                     | <input checked="" type="checkbox"/> Waste Management            |
| <input checked="" type="checkbox"/> construction                    | <input checked="" type="checkbox"/> disposal of hazardous waste |
| <input checked="" type="checkbox"/> abandonment/removal             | <input checked="" type="checkbox"/> waste generation            |
| <input type="checkbox"/> modification e.g., widening, straightening | <input type="checkbox"/> sewage                                 |
| <input type="checkbox"/> Automobile, Aircraft or Vessel Movement    | <input type="checkbox"/> disposal of sewage                     |
| <input checked="" type="checkbox"/> Blasting                        | <input checked="" type="checkbox"/> Geoscientific Sampling      |
| <input checked="" type="checkbox"/> Building                        | <input type="checkbox"/> Trenching                              |
| <input type="checkbox"/> Burning                                    | <input type="checkbox"/> Diamond drill                          |
| <input type="checkbox"/> Burying                                    | <input type="checkbox"/> Borehole core sampling                 |
| <input type="checkbox"/> Channelling                                | <input type="checkbox"/> Bulk soil sampling                     |
| <input type="checkbox"/> Cut and Fill                               | <input type="checkbox"/> gravel                                 |
| <input type="checkbox"/> Cutting of Trees or Removal of Vegetation  | <input type="checkbox"/> hydrological Testing                   |
| <input type="checkbox"/> Dams and Impoundments                      | <input checked="" type="checkbox"/> Site Restoration            |
| <input type="checkbox"/> construction                               | <input type="checkbox"/> fertilization                          |
| <input type="checkbox"/> abandonment/removal                        | <input type="checkbox"/> grubbing                               |
| <input type="checkbox"/> modification                               | <input checked="" type="checkbox"/> planting/seeding            |
| <input type="checkbox"/> Ditch Construction                         | <input type="checkbox"/> reforestation                          |
| <input checked="" type="checkbox"/> Drainage Alteration             | <input type="checkbox"/> scarify                                |
| <input type="checkbox"/> Drilling other than Geoscientific          | <input type="checkbox"/> spraying                               |
| <input type="checkbox"/> Ecological Surveys                         | <input checked="" type="checkbox"/> re-contouring               |
| <input checked="" type="checkbox"/> Excavation                      | <input type="checkbox"/> Slashing and removal of vegetation     |
| <input checked="" type="checkbox"/> Explosive Storage               | <input type="checkbox"/> Soil Testing                           |
| <input checked="" type="checkbox"/> Fuel Storage                    | <input type="checkbox"/> Stream Crossing/Bridging               |
| <input checked="" type="checkbox"/> Topsoil, Overburden or Soil     | <input checked="" type="checkbox"/> Tunnelling/Underground      |
| <input checked="" type="checkbox"/> fill                            | <input type="checkbox"/> Other:                                 |
| <input checked="" type="checkbox"/> disposal                        |   |
| <input checked="" type="checkbox"/> removal                         |   |
| <input type="checkbox"/> storage                                    |   |

**NTS topographic map sheet numbers:**

85J8 & 85J9

**Latitude / longitude and UTM system:**

Minimum latitude: 62°28'51.7224" N

Maximum latitude: 62°32'37.0248" N

Minimum longitude: 114°23'10.3122" W

Maximum longitude: 114°19'2.9676" W

NAD83 Zone 11

**Nearest community and water body:**

Yellowknife/Great Slave Lake

**Land Status (consultation information)**

- Free Hold/Private
- Commissioner's/Territorial Lands
- Federal Crown Land
- Municipal Land

**Transboundary/Transregional Implications**

- British Columbia
- Alberta
- Saskatchewan
- Yukon
- Nunavut
- National Park
- Inuvialuit Settlement Region
- Wek'èezhii
- Gwich'in
- Sahtu

Type of transboundary implication:  Impact / Effect  Development

Public concern: \_\_\_\_\_  
(Describe.)

**Physical - Chemical Effects**

**Impact**

**1) Ground Water**

- water table alteration
- water quality changes

**Mitigation**

Minor operational releases of fuel, other petroleum hydrocarbons, or hazardous materials associated with necessary earthworks, hauling and construction activities could impact shallow groundwater/minewater quality. Conservative fuel management practices will be implemented during remediation work including the use of drip trays, storage in double-walled fuel containers, and secondary containment. Standard conditions related to fuel storage, including adherence to a Spill Contingency Plan, will mitigate the risks.

Disposal of contaminated materials in the open pits could have long-term implications to groundwater quality. Pit closure design work will aim to fill the pits with coarse contaminated granular fill which is more permeable than pit wall material. The pit closure design incorporates drains into the base of the pit. These design components will mitigate impacts to shallow groundwater in the vicinity of the pits or to Baker Creek by preventing water movement laterally out of the pits. It is expected that infiltration through the pits will not influence minepool chemistry predictions such that the Water Treatment Plant design/proposed Effluent Quality Criteria (EQC) will need to be revisited. A series of analyses are underway to confirm this assumption (geochemical testing of contaminated granular fill for metals leaching and potential acid generation; kinetic testing; and comparison of geochemistry results to EQC model inputs). Should these analyses indicate that long-term leachate chemistry differs substantially from what was assumed in the EQC, additional modelling will be undertaken. Results of that modelling will be used to determine if pit cover and caps require re-evaluation. Any highly contaminated pit waste that is frozen in B1 Pit will meet the same frozen containment criteria as other freeze areas so water will not penetrate this highly contaminated pit fill and cannot enter the mine workings below. In order to deal with freeze/thaw cycles and the freeze for B1 Pit, and future climate change, there will be a thermal layer on top of the material placed deeper in the pit. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Contaminated soil that will remain on site post-reclamation and not be remediated to industrial standards could cause water quality changes to groundwater due to infiltration. The proposed Surveillance Network Program (SNP) will include groundwater monitoring. An updated Human Health and Ecological Risk Assessment (HHERA) of the site completed in 2018 that incorporated the understanding of the soil contamination across the site and the proposed management strategy (use of a fence around the Core Industrial Area, remediation of the selected 1.3 million m<sup>3</sup> of contaminated soil across the site) demonstrated that risks to humans are very low, assuming limited use of the area for recreational purposes.

Blasting activities associated with quarrying could result in increased nitrogen residues in water, and the geochemical signature of borrow materials could result in potential acid generation, if not selected properly, that could impact groundwater quality due to infiltration. Best management practices for explosives and methods which decrease the potential for unconsumed nitrogen will be used to minimize blast residues. Geochemical investigations of borrow materials are underway and a licence condition is proposed that requires adherence to a Borrow and Explosives Management and Monitoring Plan that will

include additional details regarding planning and management in the selection and blasting/excavation of borrow materials, and the handling and management of explosives. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Seepage from Water Treatment Plant (WTP) residuals (including spent ion exchange adsorptive media) deposited in the on-site landfill could impact groundwater quality. Based on toxicity characteristic leaching procedure (TCLP) testing results of samples of three brands of spent ion adsorption media from a pilot plant conducted in 2018, WTP waste ion exchange media streams are anticipated to be non-hazardous, and regular monitoring will be completed to confirm landfill performance and seepage quality. Representative sampling and analysis will be undertaken in accordance with the Waste Management and Monitoring Plan. Should future testing indicate that the WTP spent ion exchange adsorptive media is hazardous, the waste will be disposed of off-site at an accredited hazardous waste disposal facility. An SNP station is planned for the landfill sump to monitor and manage landfill seepage. In the long-term, the WTP residuals cells of the non-hazardous waste landfill will be covered using an impervious membrane to limit precipitation infiltration into the cell and prevent further formation of leachate. All waste ion exchange media will be dewatered or drained prior to disposal. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

infiltration changes

Changes in infiltration patterns to shallow groundwater may result from removal of contaminated soils (Shoreline Lands). Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Changes in infiltration patterns to shallow groundwater may result from sourcing borrow. The volume of borrow required will be minimized through detailed design for the many components requiring borrow material (e.g. options for pit filling, such as partial pit filling with water diversion berms, and recycling borrow material that result from other closure activities). Additional shallow groundwater wells will be installed to support the Surveillance Network Program (SNP) and Operational Management Plan (OMP) monitoring programs to monitor quality and quantity of groundwater. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other:

N/A

**Impact**

**2) Surface Water**

**Mitigation**

flow or level changes

Installation of a freshwater intake into Yellowknife Bay is not anticipated to change water levels in Yellowknife Bay as the volume being applied for is less than 1% of the volume of the bay. The water intake will only be required during remediation and will be remediated prior to entering post-closure. No mitigation proposed.

water quality changes

Remediation activities could cause dust, erosion and/or sedimentation and impact water quality through increases in turbidity and/or potential remobilization of contaminants. Conservative erosion and sedimentation best management practices will be implemented for all earthworks activities to minimize the impacts from erosion and sedimentation. Water licence conditions are proposed that require adherence to a Dust Management and Monitoring Plan and Erosion and Sediment Management and Monitoring Plan that includes numerous mitigation strategies to further mitigate dust, erosion, and sedimentation impacts to water quality.

Minor operational releases of fuel, other petroleum hydrocarbons, or hazardous materials, or a larger spill event associated with necessary earthworks, hauling, and construction activities could impact surface water quality. Conservative fuel management practices will be implemented at all times during remediation work including the use of drip trays, storage in double-walled fuel containers, and secondary containment. Standard conditions related to fuel storage, including adherence to a Spill Contingency Plan, will mitigate the risks.

Runoff from pits filled with contaminated material could cause increased contamination in runoff water. Contaminated materials in pits will be capped with clean, coarse material and all runoff from covers will be monitored. Where needed an engineered cover will be placed over pit fill materials. Covers will be graded to reduce ponding and if any differential settlement is noted re-grading will be carried out. The type of cover or cap will be decided upon on a pit-by-pit bases, depending on pit fill, dust control, flood risks, monitoring and maintenance requirements, the risk of settlement, and the durability. If the final design of a pit incorporates a cover that sheds water, sampling will be required to confirm it meets runoff criteria. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

The partial excavation of the Shoreline Lands could cause sedimentation. Mitigations for sedimentation during in-water work will specifically include installation of silt-curtains and in-water monitoring, and GMRP will work with Fisheries and Oceans (DFO) to obtain a Fisheries Authorization for this work, prior to implementation. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Contaminated soil that will remain on site post-reclamation and not be remediated to industrial standards could contribute contaminated water to the watershed through runoff, changing surface water quality. Runoff monitoring stations are proposed through the SNP. Runoff data from the site has previously been incorporated into water modelling across the site to ensure that proposed water quality objectives can be met. An updated Human Health and Ecological Risk Assessment (HHERA) of the site completed in 2018 that incorporated the understanding of the soil contamination across the site and the proposed management strategy (use of a fence around the Core Industrial Area, remediation of the selected 1.3 million m<sup>3</sup> of contaminated soil across the site) demonstrated that risks to humans are very low, assuming limited use of the area for recreational purposes.

Moving South Pond tailings could result in 'tracking'/leaking contamination across the site if liquids are present within the material, which could result in surface water quality contamination. Runoff from the area will be collected, monitored, and treated until it meets defined discharge criteria. Initial investigations indicate that the fine-grained soils that underly the South Pond Tailings Containment Area met or exceed the GNWT industrial land use criterion. Further characterization will be conducted once the tailings have been removed, and the remaining material will be covered or relocated. Detail on water content and liquid management will be developed as part of detailed design and construction management.

Following relocation of tailings in the South Pond runoff from the remediated tailings pond area could potentially include contaminants. Dam 7 will remain in place, south of the South Pond tailings footprint, and water will be collected and treated until water quality results show that runoff meets surface water criteria. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Blasting activities associated with quarrying could result in increased nitrogen residues in water, and the geochemical signature of borrow materials could result in potential acid generation, if not selected properly, that could impact surface water quality. Best management practices for explosives and methods which decrease the potential for unconsumed nitrogen will be used to minimize blast residues. Geochemical investigations of borrow materials are underway and a licence condition is proposed that requires adherence to a Borrow and Explosives Management and Monitoring Plan that will include additional details regarding planning and management in the selection and blasting/excavation of borrow materials, and the handling and management of explosives. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

The water intake installation could result in erosion and/or sedimentation that could impact water quality in Yellowknife Bay. DFO requirements for water intake systems will be implemented, and GMRP will work with DFO to obtain appropriate approvals for the work, prior to implementation. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Seepage from Water Treatment Plant (WTP) residuals (including spent ion exchange adsorptive media) deposited in the on-site landfill could impact surface water quality. Based on toxicity characteristic leaching procedure (TCLP) testing results of samples of three brands of spent ion adsorption media from a pilot plant conducted in 2018, the WTP waste ion exchange media streams are anticipated to be non-hazardous, and regular monitoring will be completed to confirm landfill performance and seepage quality. Should future testing indicate that the WTP spent ion exchange adsorptive media is hazardous, the waste will be disposed of off-site at an accredited hazardous waste disposal facility. An SNP station is planned for the landfill sump to monitor and manage landfill seepage. In the long-term, the WTP residuals cells of the non-hazardous waste landfill will be covered using an impervious membrane to limit precipitation infiltration into the cell and prevent further formation of leachate. All waste ion exchange media will be dewatered or drained prior to disposal. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

water quantity changes

drainage pattern changes

On-site drainage patterns will change due to soil remediation (Shoreline Lands) and borrow extraction. Construction of covers on the filled open pits will create new drainage patterns across the site. Planned drainage pathways are selected to reflect natural drainage patterns as much as possible. Borrow areas will be designed to positively drain to the extent practicable and prevent borrow pit lakes. Drainage pathways will allow runoff from engineered structures (e.g. pits) to flow from the site only once water quality meets runoff quality criteria. Reclamation work for the Shoreline Lands includes the replacement of 35,000 m3 of soil within the forest and wetland terrain that will be removed as per the remediation strategy for the Shoreline Lands. This will mitigate drainage pattern changes associated with removing soils for remediation. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

temperature

wetland changes/loss

Some small in-land wetlands exist in depressions in bedrock within the Project boundary that may be removed to remediate soils (Shoreline Lands) or extract needed borrow materials. Final borrow locations will be selected to reduce impacts to undeveloped wetland areas on site. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other:

N/A

**Impact**

**Mitigation**

**3) Noise**

noise in/near water

Partially excavating the Shoreline Lands (including near-shore sediments along the townsite area) could result in increased noise. The impact from temporary noise in support of remediation activities on species in/near water will be reduced due to the timing window selected. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

noise increase

The level of noise at the site will increase during remediation activities from heavy machine operation. All heavy equipment will be equipped with standard industrial noise suppression devices and will be maintained in good working condition. Activities will be scheduled to minimize any potential noise effects to human receptors, and on-site noise levels will be regulated by the standards established under the NWT Occupational Exposure Limits. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Periods of greater noise will occur during blasting activities. Noise from blasting occurs in short bursts and will be regulated by the standards established under the NWT Occupational Exposure Limits. GMRP will follow the City of Yellowknife noise bylaw. A condition is proposed that requires the submission of a Borrow and Explosives Management and Monitoring Plan that will include further considerations to minimize noise impacts during



blasting and excavation of borrow sources, and a communication plan for blasting notifications. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other:

N/A

**Impact**  
**4) Land**

**Mitigation**

geologic structure changes/topographic changes

Select borrow sources will result in changes to high-points in the landscape (such as knolls and ridges), and some depressions may result from extraction of borrow. The selection of high-points on the landscape for borrow source locations will minimize the creation of geologic depressions from borrow extraction, where water could collect. Borrow sources will be contoured to reflect natural topography that blends visually into the surrounding terrain, to the degree practicable. Preference will be placed on selection of borrow areas that are outside of public sightlines from Ndilo and Yellowknife. Additional engagement will be conducted in selection of final borrow locations. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

soil contamination

Any fugitive dust will result in dust fall and deposition onto surrounding lands from movement of contaminated soils and tailings (for backfilling open pits, excavating Shoreline Lands, and relocating tailings). Contaminated soils and sediments soil will be wetted down prior to, during and after excavation, as required, to prevent wind erosion. Soil excavation may be suspended in high winds and tarps or tackifier will be used when transporting loads. Machinery will be appropriately sized for level of effort to minimize soil disruption, as much as possible. Dust mitigation measures will be implemented at all times during earthworks activities to minimize dust fall and potential for resulting contamination. A water licence condition is proposed that requires adherence to a Dust Management and Monitoring Plan that includes numerous dust mitigation strategies.

Small operational discharges or spills on land from activities could contaminate soils. Standard mitigations will be implemented at all times during remediation including drip trays, containment berms and secondary containment to minimize impacts from spills. Standard conditions related to fuel storage, including adherence to a Spill Contingency Plan, will further mitigate risks associated with spills that could contaminate soil.

Moving South Pond tailings could result in 'tracking'/leaking contamination across the site if liquids are present within the material, which could result in soil contamination. Detail on water content and liquid management will be developed as part of detailed design and construction management.

Approximately 1.3 million m<sup>3</sup> of contaminated soil across the site will be remediated, however some contaminated soil will remain on site post-reclamation and not be remediated to industrial standards. Soil located within the most contaminated land, the Core Industrial Area, will be restricted from public access by a fence (two fenced areas may be necessary as the Core Industrial Area is intersected by the Ingraham Trail). The rationale for the location of the physical barrier was developed based on the forensic mineralogy findings, the soil quality model, review of case studies, and input from the risk assessment team. An updated Human Health and Ecological Risk Assessment (HHERA) of the site completed in 2018 that incorporated the understanding of the soil contamination across the site and the proposed management strategy (use of a fence around the Core Industrial Area, remediation of the selected 1.3 million m<sup>3</sup> of contaminated soil across the site) demonstrated that risks to humans are very low, assuming limited use of the area for recreational purposes. A Quantitative Risk Assessment (currently underway) will provide more detailed information on failure modes for closure components after the site is closed and assess the level of risk and acceptable risk thresholds. The QRA is expected to influence management and monitoring programs, and contingency planning, moving forward. Existing risk management activities restrict access to the site, including physical barriers and controls such as fences and gates, and 24-hour security and routine checks of buildings and infrastructure occur. Long-term land management considerations will include a

consideration of contaminated soils across the site and will include physical controls for the Core Industrial Area. In the case of a future land disposition, GMRP will provide any necessary guidance and expertise about the final state of the land, including outlining any residual risks and/or constraints to align with HHERA assumptions. Use of these lands may have constraints dependent on the lands of interest and may only be permitted to be leased with appropriate conditions. If the land were to be transferred in fee simple, considerations would be included in the transfer using restrictive covenants. The GMRP has included a risk communications approach through their Closure and Reclamation Plan (CRP), including proposing Site Wide Objective SW-4: Residual risks are identified, and local residents have been and continue to be, information of residual hazards. GMRP proposes SW-4 to include two closure criteria: public communication initiatives as outlined in the Perpetual Care Plan/Engagement Plan are undertaken (SW4-1) and a land map with residual risks identified and available at Land Titles and project websites (SW4-2). Considerations for specific residual risk communications for future generations will be developed with affected parties during the development of the Perpetual Care Plan beginning June 2019 and will include considerations for communication tools (e.g. signs, murals, oral storytelling, land administration controls).

buffer zone loss

Partially excavating the Shoreline Lands including near-shore sediments along the townsite area could include removal of littoral vegetation, which could affect species that use littoral habitat (e.g. for food sources). A water licence condition is proposed that would require adherence to an Erosion and Sediment Management and Monitoring Plan that includes numerous sedimentation mitigation strategies to mitigate sedimentation of the Shoreline Lands. Further, detailed mitigations will be presented in the Design and Construction Plans proposed to be submitted to the MVLWB as per the water licence.

soil compaction and settling

destabilization/erosion

Erosion is a potential impact of earthworks activities. Erosion and sedimentation best management practices will be implemented for all earthworks activities to minimize impacts from erosion and sedimentation. A water licence condition is proposed that would require adherence to an Erosion and Sediment Management and Monitoring Plan that includes numerous erosion mitigation strategies associated with earthworks activities. Erosional site assessments will be part of each individual Design and Construction Plans (proposed to be submitted to the MVLWB as per the water licence) as part of information provided under activity-specific monitoring and mitigation.

Geotechnical stability issues under pits and settlement of materials could be potential impacts of backfilling the open pits. Coarse rock will be used as pit fill to provide geotechnical stability and minimize erosion potential. Fine-grained soils may be used in select areas as part of the fill. Geotechnical characteristics of the greenstone rock available at the Giant Mine will be completed to determine the steepest stable fill slope that can be practicably constructed. Where exposed at the ground surface, fine-grained soils will be revegetated as a best management practice for erosion control. An ongoing investigation that includes collecting data to categorize the underground voids will improve the understanding of the requirements for stabilizing the underground areas under and adjacent to the open pits. All openings to the surface present in the open pits will be filled to prevent pit fill material from moving into the underground. If excessive settlement occurs, sinkholes develop or if underground stabilization does not achieve desired stability, areas around pits will be fenced. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Erosion could occur at areas excavated at Shoreline Lands, particularly at steep slopes near the Townsite. Active stabilization using vegetation is planned. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Any fine-grained material that remain under the South Pond tailings, if found to be of an acceptable soil quality, will be protected from erosion to prevent soil losses by placement of vegetation or rock covers. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Fine-grained borrow sources could present a potential for erosion. These sources will have

erosion controls implemented, including the potential for revegetation. A water licence condition is proposed that requires submission of a Borrow and Explosives Management and Monitoring Plan that includes further mitigations for erosion potential. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Installation of the water intake pipe on land will include some disturbance of vegetation and potential for erosion along the pipeline path. The intake and outfall pipelines are anticipated to be installed near one another to minimize additional impacts. The water intake pipe will be temporary, and it will be decommissioned prior to entering post-closure. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

permafrost regime alteration

If permafrost is present in areas where earthworks are taking place changes to the thermal regime (air or water) may impact permafrost. Engineering design teams are aware of the discontinuous permafrost zone in which the site is located, and this has underpinned design decisions.

While remediation activities will mostly occur in areas where historic mining practices have already disturbed ground/soil, excavation of borrow sources on site may result in disturbance of permafrost in areas that are not in/near previously disturbed areas. The greatest concern is for areas where quarrying for fine-grained borrow materials will occur. Avoidance of permafrost in sourcing fine-grained materials is a mitigation strategy. If permafrost is encountered, impacts will be minimized by regrading/sloping and armouring, and vegetation may be used to support this work for borrow areas. Best practices will be implemented to minimize the potential disturbance of permafrost if encountered.

explosives/scarring

Quarrying on site for required rock borrow material will require blasting. Explosives storage on site will adhere to all applicable regulations to minimize potential impacts, best management practices will be implemented during blasting and new on-site borrow sources will only be developed for borrow volumes that are not already being created as a by-product of remediation activities. Quarry permits will be acquired prior to quarrying activities. A proposed water licence condition requiring adherence to a Borrow and Explosives Management Plan will include further mitigation strategies related to blasting. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other:

N/A

**Impact**

**5) Non-renewable natural resources**

resource depletion

other:

N/A

**Impact**

**6) Air/climate/atmosphere**

other: dust

**Mitigation**

**Mitigation**

Reclamation activities have the potential to create dust and have corresponding impacts to air quality. Dust mitigations and best management dust practices for all earthwork activities will be used to minimize airborne dust. Cover material that is placed over contaminated materials will use coarse rock, not susceptible to wind erosion. GMRP has incorporated consideration of seasonal variability into the scheduling and staging of activities for seasonal variability, including historic wind patterns for activities with medium and high potential for dust generation. Increased frequency of security patrols can be used, if necessary, to identify areas of potential concern around the site regarding dust. Security personnel have direct contact with the appropriate incident response leaders to provide immediate action (e.g.

applying dust suppressant) and this will decrease the potential for fugitive dust to leave the Giant Mine site. EA0809-001 Measures related to air quality will be adhered to. This includes the following mitigations: all construction activities with the potential to release large amounts of dust or contaminants into the air will be conducted when wind directions will minimize the chance of dust and contaminants blowing into the City of Yellowknife, Dettah and Ndilo (Measure 20); dust and contaminant level data from soil and vegetation will be collected in the vicinity of major reclamation activities before and after major demolition or construction activities to serve as a baseline for any related adaptive management activities that may follow (Measure 21); and an Air Quality Management Plan which incorporates an ongoing air quality monitoring program will be developed (with interested Parties) that includes all previously identified on-site air quality monitoring stations and one off-site air quality monitoring station near Niven Lake. Ambient concentrations of NO<sub>2</sub> and PM<sub>2.5</sub> will be monitored at the Niven Lake site at a minimum. Total suspended particulate and metal concentrations will be monitored at the on-site locations, and the air quality monitoring program will identify action levels and trigger additional management and mitigation activities, if required. GMRP uses the Guideline for Ambient Air Quality Standards in the Northwest Territories (2014), as well as Ontario Ambient Air Quality Standards (2012) where NWT standards do not exist. A proposed water licence condition requiring adherence to a Dust Management and Monitoring Plan, that includes numerous dust mitigation strategies, will further mitigate dust impacts. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other: combustion emissions

Activities involving earthworks, hauling and construction require the use of motorized machinery that result in combustion emissions. The fleet of motorized remediation equipment will be maintained in good working condition.

N/A

## BIOLOGICAL ENVIRONMENT

### **Impact**

#### **1) Vegetation**

### **Mitigation**

species composition

Due to additional borrow needs vegetation areas will be cleared, however it is anticipated that the areas to be cleared will not be large enough to have additional impact on species composition within the GMRP boundary.

Soils greatly impacted by roaster emissions (approximately 1 km in radius) in vegetated areas beyond the developed area of the Site will be fenced rather than excavated to minimize vegetation clearing, as well as further impacts, from excavation of such a large area.

species introduction

To address potential erosion issues for the long-term, revegetation efforts may be required in areas where quarrying for fine-grained borrow occurred. Any revegetation will be done with native species to encourage native re-colonization to the extent possible. Some weeding may be required based on seed mix.

toxin accumulation

Fugitive dust that will result in dust fall and deposition onto surrounding lands from movement of contaminated soils and tailings could contain toxins that could impact vegetation. Dust mitigation measures will be implemented at all times to reduce any additional impacts from dust deposition. A proposed water licence condition requiring adherence to a Dust Management and Monitoring Plan, that includes numerous dust strategies, will further mitigate dust impacts. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other:

N/A

### **Impact**

### **Mitigation**

## 2) Wildlife and Fish

effects on rare, threatened or endangered species

Earthworks activities will disturb already-contaminated lands that have been used previously as habitat for wildlife, including possible use by rare, threatened or endangered species. Habitat surveys will be conducted in any areas that are to be disturbed to confirm that habitat for rare or endangered species are not present. Input from regulators and affected parties will be sought as part of detailed design so activities consider the presence and key life stage of any sensitive species in a work area.

fish population changes

waterfowl population changes

breeding disturbance

Many terrestrial species may avoid the site during remediation activities due to the noise and presence of machinery and people. Habitat surveys will be conducted in areas that are to be disturbed to confirm nesting or denning is not occurring in area prior to the commencement of work. Deterrence of birds during nesting season may be implemented to deter nesting and promote nesting and denning in habitat away from the site and remediation activities.

population reduction

species diversity change

health changes

Earthworks required for remediation activities could result in increased short-term sedimentation and contaminant mobilization in Baker Creek and Yellowknife, with potential impacts to aquatic biology and fish health. Best management practices for erosion and sedimentation controls will be implemented to minimize additional impacts to water quality during remediation activities. GMRP will work with Fisheries and Oceans (DFO) to obtain necessary Fisheries Authorization for remediation work, prior to implementation. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

behavioural changes

Due to noise and the presence of machinery and people, many terrestrial species will likely avoid the site. The factors that will result in avoidance behaviour will be significantly decreased or ceased once Phase 2 is complete.

habitat changes / effects

The partial excavation of the Shoreline Lands, including near-shore sediments along the Townsite area will result in localized habitat loss and affect aquatic habitat. A baseline study of existing habitat in Yellowknife Bay is currently underway, in support of Suggestion 14 from EA0809-001. The GMRP will work with DFO to obtain a Fisheries Authorization for this work, prior to implementation. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Minor habitat loss is anticipated in implementation of the fence line as some clearing will be required for installation of the fence. As the purpose of the fence is to limit wildlife access to the area, wildlife will have a localized decrease in access to habitat. There is sufficient habitat in the local and regional area to attract and sustain terrestrial species.

The installation of the freshwater intake could impact fish habitat. The freshwater intake will be constructed to adhere to all DFO regulations to prevent any impacts to fish; this pipe will be temporary and decommissioned before entering post-closure. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

Some vegetation will be removed in sourcing borrow material, resulting in changes to terrestrial habitat. Areas where borrow materials are removed will be graded to promote drainage. Fine grained borrow source areas may be revegetated as an erosion control measure, where required. The reclamation of the borrow sources will follow the NWT Northern Land Use Guidelines for Pits and Quarries. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

game species effects

toxins/ heavy metals

The remedial strategy for contaminated soils may result in a risk to small mammals. Post closure monitoring of the risks to small mammals and the terrestrial ecosystem within the Core Industrial Area will be further evaluated.

The 2018 HHERA determined that there were risks associated with arsenic levels to birds that consumed insects, although this evaluation was based on many conservative assumptions. The GMRP is evaluating adding an insect monitoring component to its monitoring plan. Best management practices for dust and erosion control will be implemented to minimize the spread of contaminants from site during remediation activities to prevent further risk of arsenic exposure to wildlife.

forestry changes

agricultural changes

other:

N/A

### Interacting Environment

#### Impact

#### Mitigation

##### 1) Habitat and Communities

predator-prey

Site activities (e.g. noise, the presence of machinery and people) will likely deter wildlife but increase the numbers of scavenger species (e.g. ravens and foxes). Habitat surveys will be conducted at areas that are to be disturbed to confirm nesting or denning is not occurring in areas prior to the commencement of work. There is habitat in the local and regional area to attract and sustain terrestrial species.

wildlife habitat/ecosystem composition changes

Bank swallows could nest in stockpile quarries and these nests could be disturbed if access to the stockpiles is required. Inactive stockpiles with slopes greater than 70 degrees will be reported to the GMRP on-site Environmental Manager so that appropriate action can be taken.

reduction/removal of keystone or endangered species

Remediation activities may disturb habitat that has been used previously by rare, threatened, or endangered species. Habitat surveys will be conducted of any areas that are to be disturbed to confirm nesting or denning is not occurring in areas prior to the commencement of work. Deterrence of birds during nesting season may be implemented to deter nesting. Deterrence may promote nesting and denning in habitat that is away from the site and remediation activities.

removal of wildlife corridor or buffer zone

The fence line will deter wildlife passage through the most contaminated areas of the site where vegetated and local wetland areas exist. Habitat surveys will be conducted in areas that are to be disturbed to confirm nesting or denning is not occurring in areas prior to the commencement of work.

other:

N/A

#### Impact

#### Mitigation

##### 2) Social and Economic

planning/zoning changes or conflicts

increase in urban facilities or services use

rental house

airport operations/capacity changes

human health hazard

While residual risks to human health following remediation and reclamation activities are present, an HHERA conducted at the site found that the risks are low to very low and that the situation will improve following remediation. A Quantitative Risk Assessment (currently underway) will provide more detailed information on failure modes for closure components after the site is closed and assess the level of risk and acceptable risk thresholds. The QRA is expected to influence management and monitoring programs, and contingency planning, moving forward. GMRP is funding an independently led Health Effects Monitoring Program (HEMP) (required by Measure 9 of EA0809-001) to establish current baseline levels of arsenic and other contaminants of concern in residents of Ndilo, Detah and Yellowknife, in order to compare baseline levels to those levels determined within participants sampled during active remediation and post-remediation to understand if remediation activities might be increasing the exposure of residents to contaminants (e.g. through dust exposure related to earthworks activities).

impair the recreational use of water or aesthetic quality

Due to remediating the townsite and associated area (including excavating the Shoreline Lands) to residential soil standards, access to areas currently used by the Great Slave Sailing Club will be impaired. The club operates a “not for profit” sailing school program for children and youth that would also be impacted. Access to the City of Yellowknife boat launch and dock will also be impaired. The GMRP will explore the possibility of a staged solution during detailed design and will continue to ensure there is enough lead time as possible to look at ways to minimize impacts, as well as to give the affected parties time to plan alternatives for when the land will not be accessible. The GMRP will continue to work to keep the inconvenience as short as possible and continue discussions with affected parties on minimizing impacts to this area.

affect water use for other purposes

affect other land use operations

quality of life changes

public concern

Leaving contaminated soil on site could cause public concern as it has long-term implications for the management of large areas of land at and around the site. A Quantitative Risk Assessment (currently underway) will provide more detailed information on failure modes for closure components after the site is closed and assess the level of risk and acceptable risk thresholds. The QRA is expected to influence management and monitoring programs, and contingency planning, moving forward. Existing risk management activities restrict access to the site, including physical barriers and controls such as fences and gates, and 24-hour security and routine checks of buildings and infrastructure occur. Long-term land management considerations will include a consideration of contaminated soils across the site and will include physical controls for the Core Industrial Area. In the case of a future land disposition, GMRP will provide any necessary guidance and expertise about the final state of the land, including outlining any residual risks and/or constraints to align with HHERA assumptions. Use of these lands may have constraints dependent on the lands of interest and may only be permitted to be leased with appropriate conditions. If the land were to be transferred in fee simple, considerations would be included in the transfer using restrictive covenants. The GMRP has included a risk communications approach through their Closure and Reclamation Plan (CRP), including proposing Site Wide Objective SW-4: Residual risks are identified, and local residents have been and continue to be, information of residual hazards. GMRP proposes SW-4 to include two closure criteria: public communication initiatives as outlined in the Perpetual Care Plan/Engagement Plan are undertaken (SW4-1) and a land map with residual risks identified and available at Land Titles and project websites (SW4-2). Considerations for specific residual risk communications for future generations will be developed with affected parties during the development of the Perpetual Care Plan beginning June 2019 and will include considerations for communication tools (e.g. signs, murals, oral storytelling, land administration controls).

Blasting for borrow sources within city limits could impact Yellowknife residents as unexpected events associated with blasting (e.g. a plume) may quickly be seen with potential concern. The GMRP will abide by all applicable regulations related to operating a quarry within the Northwest Territories, including those related to explosive use and misfire

reporting. The GMRP commits to using safe and efficient blasting techniques, as well as engineered blast pattern and blast initiation designs in order to minimize the impacts on the surrounding communities and its residents. Quarry permits will be acquired prior to quarrying activities. A proposed water licence condition includes adherence to a Borrow and Explosives Management Plan that will include blasting notification procedures. Further detailed mitigations and monitoring will be presented in Design and Construction Plans submitted to the MVLWB as per proposed water licence conditions.

other: security

Constructing the long-term underground access, resulting in access into the underground in the long-term, may have security concerns if not properly monitored and maintained. This access point will be within the fenced area and access will be restricted and controlled.

other: impair the recreational use of land or aesthetic quality

The requirement for borrow could result in aesthetic impacts to the land. Blasting and potentially filling pits A1 and A2 could impact the future recreational use of these areas as A1 and A2 bluffs have high potential to be developed as climbing routes. Selection of borrow locations and their design will consider several factors, including aesthetics, safety considerations, public feedback, and traditional land use/archaeological considerations. Pit closure and borrow design effort is ongoing and there will be future borrow engagement.

N/A

**Impact**

**Mitigation**

**3) Cultural and Heritage**

effects to historic property

The Yellowknife Heritage Society outdoor equipment display in the public boat launch area may be impacted. The GMRP will explore the possibility of a staged solution during detailed design and will continue to ensure there is enough lead time as possible to look at ways to minimize impacts, as well as to give the affected parties time to plan alternatives for when the land will not be accessible. The GMRP will continue to work to keep the inconvenience as short as possible and continue discussions with affected parties on minimizing impacts to this area.

increased economic pressure on historic properties

change to or loss of historic resources

change to or loss of archaeological resources

increased pressure on archaeological sites

Expansion of onsite borrow areas could result in increased pressure on archaeological sites. Further engagement on borrow and borrow sources will be conducted. Additional Archaeological Impact Assessment's (AIA's) will be conducted on any new areas should engagement identify alternatives not yet assessed through the AIA completed in 2018; this is included as a condition in the draft land use permit.

change to or loss of aesthetically important sites

effects to aboriginal lifestyle

other:

N/A

- Pursuant to Schedule 4.1 of the **Northwest Territory Métis Nation (NWTMN)** Interim Measures Agreement, the MVLWB determined that written notice was given to the NWTMN and that a reasonable period of time was allowed for NWTMN to make representations with respect to the application.
- Pursuant to subsection 1.6, paragraphs (a) and (b) of the **Akaiicho Territory Dene First Nations (ATDFN)** Interim Measures Agreement, the MVLWB determined that written notice was given to the ATDFN and that a reasonable period of time was allowed for ATDFN to make representations with respect to the Application.



**Preliminary Screener / Referring Body Information**

Akaitcho IMA Implementation Office	GNWT – PWNHC (Prince of Wales Northern Heritage Centre (w/in ECE))
Alternatives North	Golder Associates
Bathurst Inlet Development Ltd.	Gov of Canada
Bathurst Inlet Lodge	Great Slave Sailing Club
CanNor NWT Region	Great Slave Yacht Club
CBC	Hamlet of Fort Resolution
City of Yellowknife	INAC – CARD
Dehcho First Nations	INAC - NWT Inspectors
Dene Nation	INAC - Yellowknife
Deninu K'ue First Nation	Katlodeeche First Nation
Det'on Cho Corporation	Lutsel K'e Dene First Nation – Chief or Wildlife, Lands and Environment
DIAND – GIANT	Mackenzie Valley Environmental Impact Review Board
Ecology North	Manitoba Denesuline
EcoMetrix Incorporated	MVLWB
Environment and Climate Change Canada	Natural Resources Canada NRCan
Fisheries and Oceans Canada	New Nadina Explorations Limited
Fort Providence Metis Council #57	North Slave Metis Alliance
Fort Providence Resource Management Board	Northwest Territory Metis Nation
Fort Resolution Metis Council	NWT & Nunavut Chamber of Mines
Forward Mining	NWT- OROGO
General Public	Salt River First Nation
Giant Mine Oversight Board	Slater Environmental Consulting
GLWB	Smith's Landing First Nation
GNWT – ENR	Snap Lake Environmental Monitoring Agency
GNWT – ENR – EAM	TerraX Minerals Inc.
GNWT - ENR - North Slave Region	Tlicho Government
GNWT - ENR - South Slave Region - Fort Smith	Tlicho Lands Protection Department
GNWT – Executive Indigenous Affairs	Town of Fort Smith
GNWT – HSS (Health and Social Services)	Town of Hay River
GNWT – INF (Infrastructure)	Transport Canada
GNWT – ITI (Industry, Tourism and Investment)	Wek' eezhii Renewable Resources Board
GNWT – Lands	West Point First Nation
GNWT - Lands – Hay River Region	Willms@Shier Environmental Lawyers LLP
GNWT - Lands - North Slave Region	WLWB
GNWT - Lands - South Slave Region - Fort Smith	Wood
GNWT – MACA (Municipal and Community Affairs)	Yellowknives Dene First Nation
GNWT – PPCA (Policy, Planning, Communications and Analysis (w/in ITI))	

**Reasons For Decision**  
(List all reasons and supporting rationales for preliminary screening decision)

**DECISION**

Detailed Reasons for Decision are issued under a separate cover.

<b>Preliminary Screening Decision</b>	
<input type="checkbox"/>	<b>Outside Local Government Boundaries</b>
<input type="checkbox"/>	The development proposal might have a significant adverse impact on the environment, <i>refer it to the EIRB.</i>
<input type="checkbox"/>	<i>Proceed with regulatory process and/or implementation.</i>
<input type="checkbox"/>	The development proposal might have public concern, <i>refer it to the EIRB.</i>
<input type="checkbox"/>	<i>Proceed with regulatory process and/or implementation.</i>
<input type="checkbox"/>	<b>Wholly Within Local Government Boundaries</b>
<input type="checkbox"/>	The development proposal is likely to have a significant adverse impact on air, water or renewable resources, <i>refer it to the EIRB.</i>
<input checked="" type="checkbox"/>	<i>Proceed with regulatory process and/or implementation.</i>
<input type="checkbox"/>	The development proposal might have public concern, <i>refer it to the EIRB.</i>
<input checked="" type="checkbox"/>	<i>Proceed with regulatory process and/or implementation.</i>

**Preliminary Screening Organization**

Mackenzie Valley Land and Water Board

September 25, 2019

**Signatures**

Mavis Cli-Michaud, Chair



**Mackenzie Valley Land and Water Board**  
**7th Floor - 4922 48th Street**  
**P.O. Box 2130**  
**YELLOWKNIFE NT X1A 2P6**  
**Phone (867) 669-0506**  
**FAX (867) 873-6610**

## Reasons for Decision

Issued pursuant to section 121 of the *Mackenzie Valley Resource Management Act* (MVRMA)

<b>Post-EA Information Package and Land Use Permit Application Preliminary Screening</b>	
<b>Preliminary Screener</b>	MVLWB
<b>Reference/File Number</b>	MV2007L8-0031 and MV2019X0007
<b>Applicant</b>	Department of Indian Affairs and Northern Development – Giant Mine Remediation Project
<b>Project</b>	Remediation, Giant Mine Site, Yellowknife, NT

These Reasons for Decision set out the Mackenzie Valley Land and Water Board's (the Board or MVLWB) decision on the preliminary screening of a Post-EA Information Package and Land Use Permit Application made by the Department of Indian Affairs and Northern Development – Giant Mine Remediation Project (GMRP) to the Board on April 1, 2019 for MV2007L8-0031 (Licence) and MV2019X0007 (Permit).

### **1.0 Background**

The Giant Mine, located in Yellowknife, produced gold from 1948 until 1999. After the mine owner (Royal Oak Mines Ltd.) went into receivership in 1999, the mine was transferred to Indian and Northern Affairs Canada (DIAND). Immediately thereafter, DIAND entered into an agreement by which Miramar Giant Mine Ltd. continued to operate the mine, with the gold ore shipped offsite for processing, from 1999 until 2004. Mining ceased in July 2004 and DIAND again took control of the site. The Giant Mine became "orphaned and abandoned" when Miramar Giant Mine Ltd. was assigned into bankruptcy. DIAND has managed the site in a state of care and maintenance since the mine closed in 2004.

#### Regulatory Procedural History

The surface land lease for Giant Mine, L-3668T, was returned to the GNWT following the operations of the mine. The GNWT subsequently established a reserve in favour of DIAND, Reserve R662T, with the same boundaries as the former lease. DIAND, now Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), remains in control of the site. All remediation will take place within the boundaries of the former lease L-3668T, with two exceptions, the areas of the former Giant Mine "Townsite", and an area of historic tailings deposition along the north shore of the Yellowknife Bay. These additional areas were added to the reserve lands under DIAND responsibility. The entire Project is located within the limits of the City of Yellowknife. GNWT is a co-proponent with the Government of Canada on the Project, as established with the signing of the 2005 Cooperation Agreement.

On October 19, 2007 DIAND Contaminants and Remediation Division (CARD) submitted to the MVLWB their Type A Water Licence Application with accompanying Giant Mine Remediation Plan and supporting documents for the remediation of the Giant Mine Site. On March 31, 2008 the City of Yellowknife referred Licence Application MV2007L8-0031 to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for Environmental Assessment (EA) on the basis that the proposed activities to take place during the term of the Water Licence would have, in the City's opinion, an adverse impact on the environment within its municipal boundaries. On June 20, 2013, MVEIRB released its Report of Environmental Assessment (EA0809-001) for the GMRP and on August 11, 2014, the Minister of DIAND provided approval of the REA, including modified Measures.

On April 1, 2019, the GMRP Team submitted its Post-EA Information Package for Water Licence MV2007L8-0031 and Land Use Permit Application MV2019X0007 to the Board. The Post-EA Information Package and land use permit application submitted by the GMRP Team included various plans, programs, and reports for the closure and remediation of the Giant Mine Site, including information on the following ten major Project components: underground mine workings; freeze program to address arsenic trioxide dust remaining on site; open pits and mine workings; contaminated soils and sediments; Baker Creek, Water Treatment Plant, Tailings Containment Areas; borrow material; buildings and site infrastructure; and non-hazardous waste landfill.

## **2.0 Public Review and Technical Sessions**

- August 20, 2014 – MVLWB requested DIAND to submit an updated Project Description and supporting documents in order to recommence the water licencing process;
- April 1, 2019 – Post-EA Information Package and Land Use Permit Application MV2019X0007 received;
- April 10, 2019 – Post-EA Information Package and Permit Applications deemed complete and review commenced;
- May 30, 2019 – Reviewer comments and recommendations due and received;
- June 25, 2019 – Proponent responses due and received;
- July 9-12, 2019 – Technical session held by Board staff in Yellowknife, NT;
- September 9-13, 2019 – Closure criteria workshop and second technical session held by Board staff in Yellowknife, NT; and
- September 25, 2019 – Preliminary screening including Project changes since EA0809-001 presented to the Board for decision.

## **3.0 Security**

Not applicable in accordance with Section 94 of the Mackenzie Valley Resource Management Act: Notwithstanding section 7, Her Majesty in right of Canada and, for greater certainty, the territorial government shall not be required to post security pursuant to section 71.

## **4.0 Preliminary Screening Decision**

The Board has conducted a preliminary screening in accordance with section 124(1) of the *Mackenzie Valley Resource Management Act* (MVRMA). As per the Preliminary Screening Requirement Regulations of the MVRMA, the Board must conduct a preliminary screening for any application for a proposed development that requires a Water Licence and Land Use Permit if it is not exempt from Part 5 of the MVRMA.<sup>1</sup> The preliminary screening identifies potential impacts and mitigations for the proposed

---

<sup>1</sup> See the Mackenzie Valley Environmental Impact Review Board ([www.reviewboard.ca](http://www.reviewboard.ca)) for the [Environmental Impact Assessment Guidelines](#), 2004.

activities. The test within the preliminary screening is to determine whether the project ‘might have a significant adverse impact on the environment’ or ‘might be a cause for public concern.’<sup>2</sup>

The Board completed a Preliminary Screening of this application on September 25, 2019, in accordance with subsection 125(1) of the MVRMA. The Preliminary Screening includes consideration of Project changes since EA0809-001 that were not previously screened and therefore not exempt from Part 5 of the MVRMA. Project changes to be included in the scope of the Preliminary Screening were determined using information from EA0809-001, the Post-EA Information Package and Land Use Permit Application submitted April 1, 2019, and evidence gathered during the public review and technical sessions to date. The following includes a discussion of evidence used by the Board to determine the scope of the Preliminary Screening, as well as environmental and socio-economic impacts and mitigations associated with the scoped activities.

### Scope of the Preliminary Screening

GMRP submitted a Preliminary Screening Document with their Post-EA Information Package and Land Use Permit Application outlining 16 Project “modifications” and 3 potential Project “modifications” since the 2007 Application. GMRP indicated that the modifications were a result of the Environmental Assessment measures or suggestions, public engagement, or further investigations/engineering work. Board staff also created a draft Preliminary Screening Document that included an analysis of the modifications presented in the GMRP Preliminary Screening Document to help the Board and reviewers understand which modifications are Project changes since EA0809-001 that need to be screened, pursuant to 125 of the MVRMA. Board staff concluded in the draft Preliminary Screening Document that the following activities appeared to have not been assessed during EA0809-001, and could require screening:

- Remediation of open pits by backfilling (fully or partially) with clean borrow material sourced and produced from site, or with contaminated material and a layer of clean borrow material placed over the contaminated material;
- Partial excavation of Shoreline Lands including shoreline soils and near-shore sediments along the townsite area, to the foreshore tailings cover;
- Fence forested terrain, wetlands, and bedrock areas of the remediation site impacted by roaster emission fallout that has contaminated surficial materials;
- Relocate tailings in South Pond and Consolidate in North and Central Ponds;
- Dispose of spent ion exchange adsorptive media in the onsite landfill;
- Quarrying onsite for required rock material;
- Install a freshwater intake in Yellowknife Bay;
- Construction of long-term underground access; and
- Partially raise the minewater elevation in underground mine workings.

During the public review, in a response to a MVLWB staff comment asking GMRP to clarify which Project activities the Proponent believed should be screened, GMRP replied that they agreed with Board staff’s draft Preliminary Screening Document regarding activities that should be screened, except for one activity that GMRP did not agree should be screened (“dispose of spent ion exchange adsorptive media in the onsite landfill). The Giant Mine Oversight Board (GMOB) agreed with the Board staff draft Preliminary Screening Document regarding Project changes, and Slater Environmental Consulting also agreed with the document, with one exception (see contaminated soils discussion below). Due to the agreement from reviewers regarding Project changes to be screened (including disposing of spent ion exchange and

---

<sup>2</sup> See the Mackenzie Valley Environmental Impact Review Board ([www.reviewboard.ca](http://www.reviewboard.ca)) for the [Environmental Impact Assessment Guidelines](#), 2004.

adsorptive media in the onsite landfill), as well as comments received through the public review about the spent ion exchange adsorptive media, the Board has included this activity in the screening.

Slater Environmental Consulting agreed with Board staff that the effects of managing contaminated soils by restricting access with a fence did not appear to be considered in the EA, but Slater Environmental Consulting considered the issue to have a much larger scope, given that un-remediated contaminated soil will also remain outside of the proposed fence. The Giant Mine Oversight Board and the City of Yellowknife also indicated that they believed GMRP's proposal to build a fence *and* not remediate all contaminated soils across the site was a change in scope from EA that should be screened.

During the July 9-12, 2019 technical session, Board staff asked GMRP if the plan for remediating soil, including not remediating the soil across the site to industrial standards, should be screened. GMRP did not agree that it should be screened, indicating that they did not believe the Developer's Assessment Report produced during the EA process proposed or outlined excavating and cleaning up soil across the entire site to an industrial guideline, but instead identified specific volumes that would be excavated. GMRP further explained that the Developer's Assessment Report did assume that the site going forward would be suitable for industrial purposes. The City of Yellowknife indicated at the technical session that they still believed that not remediating the site to industrial standards should be screened.

Given the evidence, the Board has included the following in the preliminary screening scope regarding contaminated soil management at the site:

- Implement a remedial strategy for contaminated soils that includes fencing forested terrain, wetlands, and bedrock areas of the remediation site impacted by roaster emission fallout that has contaminated surficial materials, but does not include remediating all contaminated soils across the site to industrial standards.

During the July 9-12, 2019 technical session, the Yellowknives Dene First Nation (YKDFN) expressed significant concerns with a partial raise to the minewater elevation in the underground mine workings, and the Reclamation Research Plan that GMRP was proposing to determine if the minewater raise would be feasible. For example, one statement heard by the YKDFN regarding the minewater raise was:

*"Yellowknives Dene First Nation were alienated from those lands, and they do not want to be alienated from the comfort that that void provides in terms of the contingency factor. So it's the Elders, they don't approve of it at all. Masi cho".<sup>3</sup>*

Questions and concerns from other reviewers were brought up throughout the discussion of the underground during the technical session. For instance, GMOB brought up a concern they had with the Reclamation Research Plan about the minewater raise trial being similar to the permanent raise following a trial, and that this would increase the probability of failure.

On the last day of the July 9-12, 2019 technical session, in its closing comments, GMRP stated that:

*"We have heard the concerns raised by the [Yellowknives] Dene with respect to the reclamation research plan for the partial minewater raise. And as a result and after careful thought, the project will formally make a submission to the Board to withdraw the reclamation research plan for the partial minewater raise from its application. We really hope this will alleviate the concerns raised by the Yellowknives Dene. The*

---

<sup>3</sup> See the Mackenzie Valley Land and Water Board ([www.mvlwb.com](http://www.mvlwb.com)) for the [Giant Mine Remediation Project MV2007L8-0031 MV2019X0007 Technical Session](#) transcript page 271 lines 11 – 15, July 11, 2019.

*project still does believe it's important to consider this option for long-term maintenance of the site, and we will engage with parties in the future".<sup>4</sup>*

On August 15, 2019 GMRP sent a letter to the MVLWB formally removing the Partial Minewater Raise Reclamation and Research Plan from the Post-EA Information Package and Permit Application for Water Licence MV2007L8-0031 and Land Use Permit MV2019X0007. As such, this activity ("partially raise the minewater elevation in underground mine workings") was not included in the scope of the Preliminary Screening. Furthermore, the Board is of the opinion that removing this activity from the scope of the Project alleviated significant public concern.

#### Environmental and Socio-Economic Impacts

Mitigations proposed by GMRP during the regulatory process to date to address environmental impacts to activities to be screened are reflected in the Preliminary Screening Report Form. The mitigations include employing activity-specific best management practices, developing future designs in a way that will address required mitigations, committing to conducting future investigations and research for activities where necessary, proposing activity-specific monitoring to ensure mitigations are adequate (in some instances by ensuring monitoring results are meeting pre-determined criteria), obtaining and abiding by other authorizations where necessary (e.g. quarry permits, DFO Authorizations), ensuring that environmental standards for certain activities are met where necessary (e.g. NWT Occupational Exposure Limits for noise, Guideline for Ambient Air Quality Standards in the Northwest Territories, City of Yellowknife noise bylaws), and implementing a risk communication approach. GMRP has proposed water licence conditions that will require the Proponent to submit several different management and/or monitoring plans (e.g. Dust Management and Monitoring Plan, Erosion and Sediment Management and Monitoring Plan, Borrow and Explosives Management and Plan) following issuance of Water Licence MV2007L8-0031 and Land Use Permit MV2019X0007. GMRP proposes that these plans would be for Board approval and would include further mitigation details specific to the topic of the plan. Standard Board conditions requiring adherence to an approved Waste Management Plan and Spill Contingency Plan will also mitigate environmental impacts associated with some of the Project activities included in the Preliminary Screening scope. GMRP has also proposed to submit Design and Construction Plans for different Project components. These Design and Construction Plans would be for Board approval and would include further activity-specific mitigations and monitoring details.

Socio-economic impacts were also identified by reviewers during the public review and technical session. Along with implementing assessments and programs (Quantitative Risk Assessment, Human Effects Monitoring Program, Perpetual Care Plan) to address socio-economic impacts, GMRP has committed to continually engage with affected parties to address concerns. A standard Board condition requiring adherence to an approved Engagement Plan will mitigate socio-economic impacts associated with some of the Project activities included in the Preliminary Screening scope.

Having reviewed all relevant evidence on the Public Registry, including the submissions of the GMRP, the written comments received by the Board, evidence gathered during technical sessions, and any staff reports prepared for the Board, the Board has decided that in its opinion:

- There is no reasonable likelihood that the proposed application might have a significant adverse impact on the environment; and
- The proposed application is not a cause of public concern.

---

<sup>4</sup> See the Mackenzie Valley Land and Water Board ([www.mvlwb.com](http://www.mvlwb.com)) for the [Giant Mine Remediation Project MV2007L8-0031 MV2019X0007 Technical Session](#) transcript page 259 line 20 – page 260 line 7, July 12, 2019.

The Board believes that all comments and recommendations provided by Parties, related to potential impacts of the project, can be mitigated through the imposition of the terms and conditions developed through public review, and approved by the Board for Permit MV2018X0007 and Water Licence MV2007L8-0031. As such, the Board believes that the Post-EA Information Package and Land Use Permit Application can proceed through the regulatory process.

SIGNATURE

Mackenzie Valley Land and Water Board



September 27, 2019

---

Mavis Cli-Michaud, Chair

---

Date