

# GIANT MINE REMEDIATION PROJECT CLOSURE AND RECLAMATION PLAN

## WHAT IS IN THE CLOSURE AND RECLAMATION PLAN?

The Giant Mine Remediation Project formally submitted its application for a Type A Water Licence to the Mackenzie Valley Land and Water Board on April 1, 2019. The package represents a tremendous amount of work over several years by the Project team, community partners, stakeholders, technical experts, and members of the public. The input from the Project's numerous engagement activities was carefully considered by the team and, along with input received from partners and affected parties, is reflected in the final Closure and Reclamation Plan. The Closure and Reclamation Plan identifies the activities the Project team is proposing to remediate the site and meet its closure objectives. It provides details for the ongoing monitoring, management, and reduction of environmental effects. Components of the Plan are summarized below.

You can access the Closure and Reclamation Plan and supporting documents on the Board's public registry, here:

https://mvlwb.com/registry/MV2007L8-0031



# SITE INFRASTRUCTURE

Currently, the site has approximately 85 buildings, 25 debris stockpiles, and up to 30 kilometres of road network, utilities, and fencing. As part of remediation, the Project team plans to decommission, demolish, and remove the majority of existing infrastructure.

The Project team will construct some new infrastructure that will stay on the site after remediation is complete. This includes:

- A new water treatment plant
- Thermosyphons for the freeze program
- A transport network of roads, culverts, and bridge(s) to access the remaining infrastructure
- Power and communications services
- An overland treated water pipeline and near shore outfall
- An office space and vehicle garage

- A non-hazardous waste landfill
- A closed portal for future underground mine access (if required)
- A fence around the central area of the site that will contain the freeze infrastructure, the new water treatment plant, and the nonhazardous landfill



## UNDERGROUND

The remediation will include filling some underground areas with cemented tailings paste and other materials based on stability assessments. All openings to the underground will be covered, capped, or plugged to prevent public access.

# FREEZING OF ARSENIC CHAMBERS AND B1 PIT

The remediation includes freezing the chambers and stopes that contain the arsenic trioxide dust. The Project team will also freeze part of the B1 Pit, as it will contain some arsenicimpacted materials.

The frozen zone established around these areas will be maintained at -5°C or colder. Temperatures will be monitored to ensure the areas remain frozen.





## **OPEN PITS**

The remaining pits will be filled, or partly filled, with a combination of new quarried rock and coarse waste rock from the mine site.

## TAILINGS AND DAMS

The plan for the tailings areas and dams is to:

- Use some tailings to fill underground areas;
- Cover the cemented tailings paste Containment Areas with a liner and a rock cover;
- Relocate the South Pond tailings into the North and Central tailings ponds;
- Drain and cover the Settling and Polishing Ponds with a cover similar to the Tailings Containment Areas;
- Cover the foreshore tailings area with rock; and,

 Conduct long-term monitoring and maintenance of dams in accordance with Canadian Dam Association guidelines.

## LANDFILL AND OTHER WASTE

A non-hazardous waste landfill will be constructed within the central fenced area of the site. This landfill will contain non-hazardous waste, such as demolition debris and double-bagged asbestos waste. Water treatment plant residuals, sludge, and filter media will be disposed of in a separate cell of the landfill. Hazardous waste will be removed from site and disposed of in an approved facility.



#### **CONTAMINATED MATERIALS**

The areas previously developed for mining (except the town site and marina lands) will be remediated to the Government of the Northwest Territories (GNWT) industrial soil quality guidelines. Areas in the former mine townsite, boat launch, and shoreline will be cleaned up to meet the GNWT residential soil quality guidelines. A rock cover will be placed on sediments. It will extend from the former townsite to the foreshore tailings area. Contaminated soils will either be placed and frozen in the B1 Pit, or will be placed in A1 Pit, B2 Pit, or the Tailings Containment Area.

# **BORROW AND QUARRY AREAS**

Rock quarry and fine-grained borrow areas will provide the material needed to fill the pits and construct covers on tailings containment areas. Wherever possible, rock generated by other site activities will be used. For example, rock will be generated through re-contouring pit walls for safety and constructing a tailings spillway. After remediation is complete, the surface of borrow areas will be graded to match surrounding topography. This is to prevent erosion and impacts to surface water flows.



#### WATER MANAGEMENT

A new water treatment plant will be constructed and operated to remove arsenic and other contaminants from the mine water before it is discharged into the environment. The existing effluent treatment plant will be removed after the new water treatment plant is in operation.

The new water treatment plant will be built in the fenced central area of the site. It will be designed to produce a minewater discharge that:

- Meets the drinking water quality guideline for arsenic, which is 10 ug/L
- Meets water quality criteria that is protective of human health and the environment

The plant will run year round. Treated mine water will be transported by an overland pipe before being released into Yellowknife Bay, near the outlet of Baker Creek.



#### **BAKER CREEK SURFACE WATER**

Baker Creek will stay in its current location, although some sections will be realigned and widened. The alignment will allow the passage of large amounts of water in case of a flooding event. As well, contaminated sediment will be removed from Baker Creek. Fish access to Baker Creek will not be restricted. However, any fish habitat the Project team may construct in Baker Creek will be determined based on future consultation with Fisheries and Oceans Canada, the Yellowknives Dene First Nation, and stakeholders.

#### SITE-WIDE SURFACE WATER

Runoff that contacts the tailings covers and other engineered covers will be collected. It will then be conveyed to the mine water pool and treated prior to discharge. This will continue until monitoring confirms surface runoff from remediated areas is suitable for discharge to the environment.



#### WANT TO LEARN MORE? HERE'S HOW:

- Attend community information sessions and stakeholder meetings
- Learn about the project online: www.giant.gc.ca
- Follow us on Twitter @GiantMine
- Talk to us: 867-669-2426
- Come see us: 3rd floor, Gallery Building, 4923 52 Street, Yellowknife
- Join the newsletter mail out list at aadnc.giantmine.aandc@canada.ca



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