Surface Remediation

Giant Mine Remediation Project

Background

Several years of extensive technical and scientific research, and consultation with the public (including governments and other groups concerned about the mine site), have led to the proposal of surface remediation activities to protect the safety of local residents and the environment.

Remediation activities will minimize the release of contaminants from the mine site to the surrounding environment. The surface of the site will be remediated to industrial guidelines as outlined in the *NWT Environmental Protection Act*, with recognition that portions of the mine site may eventually be suitable for other land uses with appropriate restrictions.

Contaminated Soils

Contaminated soils will be excavated and disposed of within the frozen portion of B1 Pit, which will then be covered with non-contaminated material. Additional contaminated soils and spilled tailings will be excavated and moved into the most appropriate tailings or sludge area, and covered, along with the existing tailings and sludge.

Rehabilitation of Baker Creek

Clean-up activities include stopping the current discharge of treated water into the Baker Creek and creating a diversion channel away from the arsenic chambers. Rehabilitation of the creek channel will also encourage habitat development, and help restore Baker Creek to a condition that is as ecologically sound as possible, given the constraints of hydrology and climate.

Highway Diversion

A portion of Highway 4 will be relocated away from the arsenic chambers to avoid interference with surface facilities required for ground freezing.

Baker Creek will be diverted and rehabilitated as part of the Remediation Plan.

Water Management

A new water treatment plant will be constructed to treat contaminated water extracted from around the arsenic trioxide chambers and stopes – step like parts of the mine where minerals are extracted – during and immediately after the ground freezing. Contaminated surface water will also be collected and treated until monitoring data clearly shows that the arsenic levels are low enough to allow direct discharge. Over the longer term, it is expected that water from the underground mine areas outside the frozen zones may continue to need treatment, and the new water treatment plant will remain in operation as long as required.

Open Pits

There are eight open pits on the mine site, five of which are substantial in size. The B1 Pit will be backfilled to facilitate installation of the ground freezing system. Contaminated soils from other areas on the mine site will be contained in the portion of the pit that will ultimately be within the frozen zone. Waste rock, quarry rock or clean demolition waste will be used to fill the remainder of the pit. The entire backfilled area will then be covered with soil and re-vegetated. The other pits will be surrounded by berms or fences to prevent inadvertent public access.

Surface Remediation

An aerial overview of the Effluent Treatment Plant, polishing and settling ponds at Giant Mine

The Assay Office at Giant Mine is one of more than 100 buildings on site scheduled for demolition

Tailings

The tailings and sludge areas will be covered with one layer of quarried rock and a second layer of fine-grained soil. The lower layer of quarried rock will prevent contaminants from the tailings from moving upward and inhibit the downward penetration of plant roots. It will also serve as a final protective layer in the event that the soil erodes. The upper layer of fine-grained soil will enable vegetation to grow and a variety of future uses for the site may be considered. The surface of each tailings area will be graded, and ditches and spillways constructed, to limit erosion and to allow water to run off the cover without becoming contaminated.

Removal of Mining Roads

Mining roads not required for maintenance and inspections at the site will be removed, and these areas will be planted with native vegetation to restore them as closely as possible to their natural state.

Buildings and Infrastructure

More than 100 buildings, supported by associated infrastructure and utilities, remain on the mine site. Many of these buildings pose a hazard to the public. The Remediation Plan calls for all buildings and infrastructure without an identified existing or future use, to be removed and disposed of according to industry-best practices. Any arsenic-contaminated materials will be removed and placed in the empty chamber 15 and frozen underground at that time.

When will this work be done?

The regulatory process could take several years. Once regulatory approvals and licensing by the Mackenzie Valley Land and Water Board under the *Mackenzie Valley Resource Management Act* (MVRMA) are completed, the Remediation Plan can then be implemented.

It is anticipated that surface remediation could be completed within five years of receiving approvals. During this interim period, regular care and maintenance activities will continue at Giant Mine to protect human health, public safety and the environment.

Giant Mine Remediation Joint Project Office

2nd Floor, Waldron Building, 5103 - 48th St., Yellowknife, NT X1A 1N5
Tel.: (867) 669-2426 Fax: (867) 669-2439 Email: giantmine@ainc-inac.gc.ca

QS-Y289-010-EE-A1 Cette publication est aussi disponible en français sous le titre :
Travaux de restauration de surface

Northwest Territories

Canada