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Your file - Votre référence
NWB1NAN9702
Our file - Notre référence

August 8, 2002

Ms. Alexandra Thomson
Nanisivik Coordinator
Nunavut Water Board
Box 119
Gjoa Haven, NU
X0B 1J0

Dear Ms. Thomson,

Re: Nanisivik Mine: Considerations for Water Licence Terms and Conditions

On behalf of the Department of Indian Affairs and Northern Development, I offer the following suggestions for the Board's consideration. The recommendations we have chosen to make are based in large measure in our belief that the present A&R plan is still deficient in the manner in which a number of issues are addressed.

We believe these suggestions are necessary to guide the company in order address the outstanding issues identified at the public hearing while leaving open to the company the options for management of the issues.

Sincerely,

Paul Smith
Manager, Water Resources
Nunavut Regional Office
(867) 975-4550

Canada

Suggested Terms and Conditions Relating to Mine Closure

1. The company shall prepare a final A&R plan which presents:

- general reclamation objectives for the site,
- specific reclamation objectives for each mine component, and,
- detailed documentation (text and engineering drawings) which demonstrate that the proposed reclamation measures will be effective in meeting the objectives and how the reclamation work will be carried out, and,
- a schedule of when the work will be carried out.

The final reclamation plan shall be submitted to the Board for approval not later than 180 days from the date of issuance of the Licence.

2. The company shall include in the A&R plan a detailed assessment of the proposed covers which includes:

- description of proposed materials,
- results of field testing and the thermal modeling for covers over tailings, waste rock and landfill debris,
- assessment of cover performance under 1000 year return period warm year and global warming scenarios,
- plans showing the pre and post cover topography on not less than 0.15 cm contour intervals,
- a description of the cover construction methodology including QA/QC to ensure minimum thickness is achieved,
- confirmation of available supplies of materials for cover construction,
- the bathymetry of the sub-aqueous tailings in West Twin Lake which shows the extent of tailings which are located within 1.0 m of the water surface, and plans for mitigation of wave action on these tailings,

3. The company shall include in the A&R plan a detailed assessment of the postulated talik in the surface tailings cell and the test cell which includes:

- the results of drilling and other investigations to characterize the extent of the taliks,
- thermal conditions and soil properties within the taliks,
- identification of the potential for and extent of frost heave, pore water expulsion (volume, rate and water quality) and pingo formation, and measures to mitigate the effects of any of these processes should they be expected to occur.
- The company shall include in the A&R plan a detailed assessment of the quarries for cover construction which includes:
- description of mining method and rate of production,
- identification of waste/overburden volumes and disposal site, and,
- description of final quarry geometry and reclamation measures.
- The company shall include in the A&R plan a detailed assessment of the proposed spillway which includes:

- design hydrology,
- spillway geometry, with emphasis on the geometry where the spillway meets the covered tailings,
- geology along the centre line of the spillway,
- erosion protection measures,
- perform an assessment on the effects of permafrost formation in shallow regions of the reservoir portion, or entrainment of tailings within surface ice formation will have on the resuspension of tailings and how these mechanisms will effect long term water quality, and,
- assess how pore water expulsion from the freezing surface cell may affect the long term water quality of the reservoir portion of the WTDA.

4. The company shall include within the A&R plan a comprehensive closure section, complete with engineered drawings, for the West Twin Disposal Area, which includes:

- a brief description of historical operating practices, water movement and overall function of the system,
- an updated water balance for the system,
- current site assessment including characterization of all tailings both physical properties (gradation, density, minerology) and thermal conditions in the surface cell, dyke and possibly the reservoir,
- cover design and description of all construction activities associated with the closure plan,
- predictions of site stability and water quality with details of analyses that support the plan,
- contingency plans for dealing with uncertainties and adverse performance during the post-closure monitoring period. These plans need to include a discussion of events that trigger their implementation,
- a monitoring plan that includes: permafrost stability, deformations of both the dyke and soil cover as well as water quality determinations, and,
- an appendix that constitutes a construction plan with material specifications, a quality control plan and as-built deliverables.

5. The company shall include in the A&R plan a detailed assessment of metal release rates from mine soils (waste rock, pit walls, roads, wind blown tailings, concentrate spills) under acidic and alkaline leaching conditions. This assessment shall include an evaluation of the metal release rates from the site under: assumed or estimated pre-mining conditions, current conditions, and upon completion of reclamation activities.

6. The company shall include in the A&R plan a detailed assessment of the contaminated areas (spills and industrial landfill) which includes:

- results of the phase 2 investigation,
- an assessment of the closure options for hydrocarbon contamination and the industrial landfill, and,
- a description of the proposed approach including a comparison of the proposed approach to comparably contaminated industrial landfill remediation at DEW line and

other northern sites.

7. The company shall include in the A&R plan a detailed assessment of the underground disposal areas which includes:

- a simple classification system for was designated for underground disposal based on type and future risk,
- criteria for segregation of material according to the classification system adopted,
- allocation of available space, based on the premise that those materials that pose the greatest risk will be stored in the deepest portions of the workings,
- placement methods and schedules for the various material types,
- maps and sections that show typical or critical components of the disposal areas both before and after filling,
- plans and sections which show the extent of the proposed disposal areas,
- an estimate of the percentage of each void space to be filled.
- an evaluation of those locations that pose the greatest risk of long-term instability. Identification of monitoring where it may be required, and,
- an outline of the documentation that will confirm compliance with the disposal plan and the deliverables that will be on file following closure,

8. The company shall include in the A&R plan a detailed assessment of the waste rock inventory which includes:

- plans, sections and estimated volumes of potentially acid generating or metal leachable waste rock at the primary disposal areas,
- a description of the removal methodology, sequence, rate and disposal locations for material which cannot remain on surface, and,
- an estimate of the quantity of acid generating or metal leachable waste rock which cannot be practically removed and the scope of compensatory environmental protection measures.