



Giant Mine Environmental Assessment

IR Response

Round One: Information Request - Alternatives North #11

June 17, 2011

INFORMATION REQUEST RESPONSE

EA No: 0809-001

Information Request No: Alternatives North #11

Date Received

February 28, 2011

Linkage to Other IRs

YKDFN IR #02, 03, 04

Date of this Response

June 17, 2011

Request

Preamble:

The remediation options that were considered for the pits are:

- Backfilling and covering;
- Allowing flooding to form full depth pit lakes; and
- Partially backfilling and flooding to form shallow pit lakes or wetlands.

Backfilling and covering the pits would produce a surface that could allow a variety of future land uses. The main issue is the availability of backfill material. The available amount of clean backfill is very limited and is also in demand for other remediation activities. Two sources of material for backfilling the pits are the tailings and the contaminated soils from elsewhere on site. Both of these materials contain high levels of arsenic. Measures to limit release of that arsenic would need to be included in the backfill design.

Establishing pit lakes might provide additional aquatic habitat. However, the pits are connected to the underground mine workings. Therefore, any water allowed to accumulate in the pits would be contaminated for as long as the mine water itself was contaminated.

Partially backfilling all the pits could minimize the contact between the contaminated mine water and the shallow pit lakes or wetlands. However, any leakage through the backfill could result in Baker Creek drying up during low flow periods. The lack of sufficient clean backfill is also a problem for this option. After consideration of these options, it was decided to proceed with a combination that makes use of the limited available backfill, reduces physical hazards associated with mine openings and pit walls and prevents the formation of contaminated pit lakes. (pg. 6-51 and 6-52).





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Question:

1. Please provide a systematic review of the reclamation alternatives considered for each pit on site including cost, perpetual care requirements (including fences, berms, water treatment), risks, and uses and any other matters considered.
2. Please indicate whether perimeter blasting and sloping was considered as an option and whether it might eliminate the need for fences and firms.

Reference to DAR

s.6.4.2 Method Selection, Alternatives and Preferred Alternative

Reference to the EA Terms of Reference

s.3.2.4 (7) Development Description

Response 1 Summary

The analysis of options for the pits has been addressed elsewhere. References are provided below.

Response 1

Section 6.6.6 of the Developer's Assessment Report (DAR) and the response to the Yellowknives Dene First Nation Information Request #03 address this request.

Response 2 Summary

The use of drilling and blasting as an alternative to berms and fences is discussed in more detail.

Response 2

Perimeter blasting and sloping as a method of remediating pit walls were not documented as a viable alternative to fencing and berms, due to NWT Mining Health and Safety Regulations as well as practical limitations. The Regulations specifying open pit security are:

- Surface Openings: Section **1.128**. The manager shall ensure that surface excavations or openings are securely fenced or otherwise protected against inadvertent access; and
- Cessation of Work: Section **17.03**. (1) Where work at a mine or exploration site is stopped for a period exceeding 30 days, the owner or manager shall cause the entrances to the mine or exploration site and all other pits and openings that are dangerous by reason of their depth or otherwise, to be suitably protected against inadvertent access within the time limit specified by the chief inspector.





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The requirement to prevent inadvertent access, i.e. fencing or berms, would still be needed even though the pit walls were drilled and blasted to make to a stable slope. The excavation would become considered an extension of the pit. Perimeter blasting and sloping the walls of a pit would not change the potential hazard of settlement of the pit floor, or failure of a pillar between underground workings and the pit.

The practical limit to sloping the pit walls can be illustrated by assuming that the blasting and sloping will result in a long term stable slope of 2.5 to 1 (horizontal to vertical) for unconsolidated material, like blast rock. Blasting the pit walls back to that slope would result in the top of the walls extending quite a distance beyond the existing pit walls. Some practical constraints to making a 2.5 to 1 slope would be (from south to north):

- A2 Pit: an excavated slope on the east side would encounter A Shaft and the underground mine excavations beneath the hill near A shaft. The excavation would also pass through a power line, Baker Creek, leaving no place for the creek to flow, Highway 4, the Mining Heritage Society site, and possibly out into Great Slave Lake. Excavation on the west side would encounter a high rock hill and an electrical power line. Excavation on the south side may cause instability in the DWC Stope area.
- A1 Pit: as with A2 Pit, the excavation on the east side would pass through a power line, Highway 4 and Baker Creek. Excavation on the west would encounter a water diversion channel that diverts surface water past the pit, a high rock hill and an electrical power line.
- C1 Pit: an excavated slope on the east side would pass through a power line, Highway 4 and a possible future location to relocate Baker Creek. On the south and west sides, an excavated slope would pass through Baker Creek. On the west side a high rock hill and electrical power line would be encountered.
- B2 Pit: an excavated slope on the east side would pass through the four AR1 arsenic storage chambers, Baker Creek, Highway 4 and possibly the AR2 arsenic storage area. On the north side the slope would pass through Baker Creek and B Shaft. A high rock hill and Brock mine workings would be encountered on the west side.
- B1 Pit: this pit is to be backfilled, however fencing or berms may still be required to prevent entry as failure of underground mine openings could lead to unsafe conditions.
- B3 Pit and B4 Pit: as with the above pits, drilling and blasting would be a major change to the landscape and environment surrounding the pits.

