



Giant Mine Environmental Assessment IR Response

Round One: Information Request - Alternatives North #09

May 31, 2011

INFORMATION REQUEST RESPONSE

EA No: 0809-001

Information Request No: AltNrth #09

Date Received:

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Linkage to Other IRs

YKDFN IR #8
Review Board IR #4-6

Date of this Response:

May 31, 2011

Request

Preamble:

The DAR describes the initial frozen wall as follows:

The objective of the first step will be to create a frozen zone around each storage area that is wide enough to prevent any outflow of water or soluble arsenic trioxide when the chamber or stope is flooded. The current design criterion to reflect that objective is a ground temperature colder than -10°C over a distance of at least 10 m around and below each chamber and stope. (pg 6-28)

Question

1. What is the rationale behind these design criteria?
2. What are the contingencies if these criteria are not reached?

Reference to DAR (relevant DAR Sections):

S. 6.2.6 Initial Freeze (pg. 6-28)

Reference to the EA Terms of Reference:

S.3.3.1 Arsenic Containment

Summary

The criteria for initial freezing were selected to be conservative. The criteria of a -10 °C temperature over a width of 10 m are the same as were adopted at the McArthur River uranium mine in northern



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Saskatchewan. If the criteria are not met within the planned duration, there would be an extension of the initial freeze period.

Response 1

The design criteria rationale for the frozen block method is described in Section 3.2 of the report, "Conceptual Engineering for Ground Freezing" (Supporting document J1 of the Remediation Plan).

The initial criteria are the same as were adopted at the McArthur River uranium mine in northern Saskatchewan. There, ground freezing is used to provide a "freeze curtain" that isolates the mine working from an adjacent rock layer containing high pressure groundwater. The report outlines differences between the McArthur and Giant sites that indicate the conditions at Giant Mine are more favorable to freezing. The main differences are:

- There will be no significant influence of groundwater flow as the Giant Mine will be dewatered during the initial freezing process;
- The freeze wall depths at Giant Mine are typically 100 m, much shallower than the 530 to 600 m depth required at McArthur River;
- The high grade uranium ore at McArthur River creates heat; there are no heat sources present in the ground at Giant Mine;
- Initial temperatures at Giant Mine (typically between -2 and +5 °C) are much cooler than the +5 to +25 °C initial temperatures at McArthur River.

The differences suggest that applying the McArthur River criteria to the Giant Mine ground freezing will be conservative.

Response 2

If the initial criteria of -10°C over a distance of 10 m are not met within the planned duration, there would be an extension of the initial freeze period. Additional contingency measures include:

- If any, replace defective components;
- If required, install additional freeze pipes;
- Extend the duration of the active or hybrid freezing and delaying the transition to passive operation;

In the long term, once the chamber and stopes are completely frozen, the time to repair the damaged freezing system will not be critical, as it would take many years before the thawing reached the dust. Further details on thaw time predications are available in the "Conceptual Engineering for Ground Freezing".

