



Giant Mine Environmental Assessment

IR Response

Round One: Information Request - Review Board #12

June 17, 2011

INFORMATION REQUEST RESPONSE

EA No: 0809-001

Information Request No: Review Board #12

Date Received

February 14, 2011

Linkage to Other IRs

Review Board IR #08, 13, 14, 15
YKDFN IR #05, 10

Date of this Response

June 17, 2011

Request

Preamble:

The DAR section on accidents and malfunctions only examines failures of individual elements of the project in isolation. It describes what would happen assuming all design features, mitigation measures and emergency response plans are functioning ideally. It does not address likelihoods and severity of each risk. It provides no scenarios of larger events that could cause compound failures of several elements, or consequences of domino effects within overall systems. This includes the larger events described in section 9.

The risk assessment defines “credible” events as those that have a reasonable probability of occurring within the first 25 years, based on the temporal scope of the EA. However, the temporal scope defines the activities assessed, not the duration of effects of the project to be considered. The Board assesses what happens because of development activities occurring within that time, not only the effects that happen during that time. The developer’s definition of “credible” appears to exclude all long-term risks and low probability events.

Question:

1. Please identify risks for the life of the project, beyond those occurring during initial development activities.
2. Please identify scenarios for events in short and long-term which could cause multiple failures of components of the project
3. Please evaluate probabilities and severities and consequences (including costs) resulting from those scenarios





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4. Please describe how failures of individual components would affect the larger systems they are a part of
5. Please describe probabilities, severities and consequences (including costs) for the events discussed in section 19 plus any additional long-term risks identified (see point 1, above).

Reference to DAR (relevant DAR Sections)

- s. 9 Effects of the Environment on the Project
- s. 10 Assessment of Accidents and Malfunctions

Reference to the EA Terms of Reference

- s. 2.3 Temporal Scope
- s. 3.2.5 Accidents and Malfunctions

Response 1

Three risk workshops were arranged and at the first session, Failure Scenario Analysis (FSA) trees were developed which summarize failure scenarios relevant to this project. These FSA trees identify the initiating events for the overall project, as well as the impact a component failure has on an overall system. Appendix A of the attached report, "Failure Mode Effects Criticality Analysis (FMECA) - Giant Mine Remediation - Giant Mine Remediation – Mackenzie Valley Environmental Impact Review Board – Information Request 12 Response," presents these FSA trees for the various systems and evaluates risk in both the short and long term.

Response 2

Cascading Event Scenarios and Multiple Cause Scenarios were developed to assess how multiple failures of components would affect the Giant Mine Remediation Project (Remediation Project) in both the short and long term. A cascading event scenario refers to a series of accidents and malfunctions occurring because of one initiating event; which may cause another malfunction to lead to a series of other multiple malfunctions. The cascading event scenarios developed for both the short and long term of the Remediation Project are presented in Appendix B of the attached report. Multiple cause scenarios were also examined in preparing the response for Question 2. A multiple cause scenario is a specific fault scenario which includes two or more initiating events occurring simultaneously. These types of scenarios generally have a lower likelihood as they require two unrelated causes to happen simultaneously. In the evaluation of multiple cause scenarios, focus was placed on evaluating multiple cause scenarios for the freeze and water management systems. The multiple cause scenarios developed for both the short and long term are presented in Appendix C.



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Response 3

To evaluate the probabilities, severities and consequences, experienced workshop participants reviewed the hazards and risks from the FSA Trees and further examined consequences, probabilities and severities through Failure Modes Effects Criticality Analysis (FMECA). The risks were broken down into detail and were given a rating for the likelihood of occurring, and a risk rating for public safety, environment and cost consequences. If the scenario posed risks at a level of moderate to high, mitigating measures/design elements were applied and the risk rating was re-evaluated. The FMECA tables for the major systems are presented in Appendix D of the attached report.

Response 4

The first of three risk workshops arranged developed Component FSA Trees which summarizes how a component failure can affect an overall system of the Remediation Project. Appendix A of the attached report presents these Component FSA trees for the various systems and looks at risk in both the short and long term.

Response 5

To evaluate the probabilities, severities and consequences discussed in section 10, the workshop participants reviewed the risks from the FSA Trees and further examined consequences, probabilities and severities through FMECA. The risks were broken down into detail and were given a rating for the likelihood of occurrence, and a risk rating for public safety, environment and cost consequences. If the scenario posed risks at a level of moderate to high, mitigating measures / design elements were applied and the risk rating was re-evaluated. The FMECA tables for the major systems are presented in Appendix D of the attached report.

