



# Giant Mine Environmental Assessment

## Round Two Information Request Response

EA No. 0809-001

Fisheries and Oceans Canada IR #01

### ROUND TWO INFORMATION REQUEST (IR) RESPONSE

**EA No: 0809-001**

**Information Request No: Fisheries and Oceans Canada IR #01**

#### **Date Received**

December 1, 2011

#### **Linkage to Other IRs (Round II)**

Alternatives North IR #17

#### **Linkage to Other IRs (from Round I)**

Review Board IR #12

#### **Date of this Response**

February 17, 2012

#### **Request**

##### ***Preamble***

During the first round of information requests, the Giant Mine Remediation Team (Giant) provided a Failure Modes Effects Critical Analysis (FMECA) in response to Information Request #12 from the Review Board. While DFO attempted to clarify various aspects of this report during Day 4 of the technical sessions, certain aspects of the report remain unclear.

Based on DFO's review and current understanding of the FMECA, the majority of initiating events/causes that result in Baker Creek infiltrating the underground are related to failure of systems and components on the site itself, such as channel blockage from construction activity, crown pillar collapse, loss of ground support and subsidence, all related to stability of the surface and underground. The only initiating event directly related to Baker Creek itself, as outlined in FMECA, is a high flow event.

It is also our understanding that the systems and components of the site related to stability and the potential initiating events, as outlined above, are proposed to be addressed in the Remediation Plan submitted in 2007. Furthermore, it's our understanding that the flooding risk associated with Baker Creek is also proposed to be addressed in this plan through realignments of the creek itself.



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During the technical sessions questions were raised by the Review Board staff on whether Giant would consider relocating Baker Creek off-site as a result of “unacceptable long-term risk”. DFO believes it is crucial to clarify the initiating events that could lead to the infiltration of Baker Creek into the underground, and the reduction of risk outlined in the FMECA, as these points are imperative in making decisions regarding unacceptable risk and the causation.

Additionally, there was a lengthy discussion during the technical sessions between the Review Board’s experts and Giant on what a “worst case scenario” would entail and the risks from Giant Mine associated with such an event. It is DFOs understanding that the potential effects from a worst-case scenario situation are at their peak prior to remediation. The proposed remediation project should immediately lower the risk of such a scenario as the remediation commences. It is unclear if this “worst-case scenario” discussion is related to present conditions on site or the remediation project itself.

### **Question**

1. Given the results of the FMECA, would Giant consider that the risks related to Baker Creek (from initiating events from Baker Creek itself or the stability of site) are short-term and will be significantly reduced once the remediation project is implemented? Can Giant describe their current understanding of residual risks related to Baker Creek following the implementation of the remediation project?
2. Does Giant anticipate that any works proposed in the Giant Mine Remediation Plan will exacerbate any effects of a worst-case scenario related to Baker Creek? For further clarification, will any future works proposed by Giant result in a more severe worst-case scenario as compared to current present-day conditions?

### **Reference to DAR (relevant DAR Sections)**

s.10 Accidents and Malfunctions

### **Reference to the EA Terms of Reference**

s.3.2.5 Accidents and Malfunctions

### **Summary**

As part of the first round of Information Requests (IR), a Failure Mode Effects Criticality Analysis (FMECA) report was completed to address Review Board Round 1 Information Request #12. This report included FMECA analysis for a variety of different failure scenarios identified specifically for the Giant Mine site in both the short term (during implementation) and long term (post implementation). The FMECA Report includes FMECA analysis located in tables in Appendix B.



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The risks identified as moderate high or high associated with Baker Creek are reduced as a result of the planned remedial activities. Remaining risks in the long term are associated with the collapse of channel containment as a result of loss of ground support. The risk rating is reduced as a result of underground stabilization efforts including backfilling at A2 Pit raise. Thus, the Giant Mine Remediation Project Team (Project Team) does not anticipate that the implementation of the Giant Mine Remediation Plan (Remediation Plan) will result in a more severe worst case scenario given the proposed remedial underground stability work and surface water management plan.

### Response 1

The risk scenarios for both the short and long term for the Baker Creek system are included in Appendix B of the FMECA Report for a variety of initiating events. These scenarios are categorized based on the likelihood of the scenario and the consequence severity. The risks associated with Baker Creek that are present in the short term would be managed and reduced in the long term. The risk rating and the consequence is thus reduced in the long term for similar scenarios.

For example, scenario BCS-4 in Appendix B is a short term scenario which has an initiating event of underground instability. An underground collapse happens at a location which causes a failure of the Baker Creek bed or creek bank. The scenario occurs at freshet, which is a high flow event. The risk rating for this scenario is rating a "Moderate" for public safety and "High" for environment and cost. The improved channel cross section with a higher capacity to pass a large storm reduces the risk of an overtopping of the creek bank and the measures planned underground to stabilize and support crown / sill pillars reduces the risk of failure of the creek bed or channel. Thus, the risk rating is reduced in the long term after the implementation of mitigating measures to "Moderate" for public safety, "Moderate High" for environment and "High" for cost. The design effort now would continue to focus on further reduction of the consequences after remediation.

As another example, scenario BCS-10 is essentially the same initiating event as BCS-4, but assessed in the long term. The risk rating for public safety remained "Moderate", but the risk rating for environment and cost were reduced from "High" in the short term to "Moderately high" in the long term.

To answer the second part of the question in Response 1, Appendix B of the FMECA Report lists the current understanding of risks following implementation (long term) and their ratings. Specifically, failure scenarios BCS-6 through BCS-10 are failure scenarios which identify risk in the long term associated with Baker Creek. In all cases the risk ranking was reduced from the short term levels of risk with several items still requiring improvements. This would be part of the focus for the detailed design effort.

### Response 2

The Project Team does not anticipate that the implementation of the Remediation Plan will exacerbate risks associated with Baker Creek. As shown in the FMECA Report, Appendix B, the risk ratings remain



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consistent or are reduced from short to long term. As noted above there are still risks associated with the creek post-closure, but all risks have been reduced from the short term.

The Project Team anticipates that the implementation of the Remediation Plan will reduce risks associated with Baker Creek. The questions refers to “any future works” which is not included in the scope of the FMECA report, all risk assessments have been completed assuming that the implementation of the Remediation Plan will go forward as currently planned.



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Fisheries and Oceans Canada IR #02

### ROUND TWO INFORMATION REQUEST (IR) RESPONSE

**EA No: 0809-001**

**Information Request No: Fisheries and Oceans Canada IR #02**

#### **Date Received**

December 1, 2011

#### **Linkage to Other IRs (Round II)**

Fisheries and Oceans Canada IR #01  
Alternative North IR #14  
Review Board IR #02, 03

#### **Date of this Response**

February 17, 2012

#### **Request**

##### ***Preamble***

During the Giant Mine EA Technical Sessions held from October 17-21, 2011, the Giant Mine Remediation Team (Giant) introduced the concept of a contingency plan that involves a diversion of Baker Creek off-site should the creek pose an unacceptable risk to the underground.

On Day 3 of the Technical Sessions, DFO recommended that additional information related to the North Diversion be submitted to parties to assist them in reviewing the contingency plan as part of the EA process (*Giant Mine Technical Session Transcript, Day 3, October 19, 2011, p.19-20.*). This included but was not limited to:

- Definition of emergency and emergency scenarios on site that would initiate consideration/requirement for a North Diversion;
- Criteria that would be used for decision making related to the use of the north diversion;
- A hierarchy or outline of contingency measures, monitoring and mitigative actions that would be conducted on site to avoid an emergency/worst-case scenario from developing, including such things as a water management strategy for Baker Creek;
- Conceptual aquatic effects assessment of the potential north diversion, including effects to Baker Creek and other potential water bodies from the:
  - Construction of the north diversion
  - Short-term or temporary operation of the diversion
  - Long-term or permanent operation of the diversion



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Fisheries and Oceans Canada IR #02

Giant provided some additional information on the North Diversion in the response to Undertaking #5 regarding the feasibility work performed to date, potential regulatory requirements related to implementation of a diversion, as well as potential interactions between the diverted Baker Creek water and the Yellowknife River. The response also indicated that a workshop is planned in 2012 to conduct further analysis and evaluation of risks, mitigation approaches and thresholds. While DFO realizes that work in this area is ongoing, we feel that the information outlined and requested during the technical sessions is necessary to fully evaluate this contingency.

### Question

DFO requests that Giant provide a status on the feasibility studies, baseline information and effects assessment of the North Diversion. This should also include a timeline for the submittal of this information to the Review Board as part of this environmental assessment. DFO also recommends that the information outlined during the technical session and subsequently sent to Giant in a letter, should be submitted as part of the contingency plan. In particular the plan should include an effects assessment related to the construction, and the short-term and long-term operation of the diversion

### Reference to DAR (relevant DAR Sections)

- s. 5.8 Baker Creek
- s. 7.1.2.1 Study Site Area
- s.7.4.3 Aquatic Environment, Site Study Area

### Summary

The North Diversion of Baker Creek is not currently being pursued as a contingency measure.

### Response

The Giant Mine Remediation Project Team (Project Team) is no longer pursuing the North Diversion as a contingency for flooding risks of Baker Creek.

The North Diversion of Baker Creek was evaluated to determine if it was technically possible to divert water away from the Giant Mine site should an event occur that allowed water from Baker Creek to flood the mine. The risk of Baker Creek flooding the underground is one of the highest risks on the property until the Giant Mine Remediation Plan (Remediation Plan ) is implemented on site. The technical feasibility of the North Diversion was assessed in September 2011 to address these high risks and heightened concerns arising from the subsidence at B1 adjacent to Baker Creek and the Creek changing course over the JoJo Lake tailings during the spring melt.

Some mitigation measures have been put in place during the fall of 2011 to reduce these risks, such as capping the JoJo Lake tailings, constructing a dyke between Baker Creek and subsidence at B1 and raising the road along reach 3 (C1 pit) of Baker Creek. With these measures in place, the Project Team still considers Baker Creek a high risk and to address these risks are doing a review of the risks



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associated with Baker Creek in the short term up until the final Remediation Plan is in place. This review may show that additional short term mitigation measures are required until implementation of the mitigation strategies found in the Remediation Plan.

This review is currently underway and an assessment of requirements for additional mitigation measures will occur in 2012 with support of Technical Experts. The Project Team is in the process of reviewing site risks and therefore do not have a firm date for the assessment of mitigation measures with Experts.

The Project Team has not done any additional work to advance the design of the North Diversion and is currently focusing on the risk review and assessment of all possible short term mitigation measures for Baker Creek. The Project Team will be pleased to share this information with the Mackenzie Valley Environmental Impact Review Board and the Parties to the Environmental Assessment prior to the Public Hearing.