Attachment 1

Freshwater Environment

Comment Number	**3.1.1 Freshwater Fish Community- Rascal Goose Lake Diversion**
Subject / Topic	Freshwater Fish Community, Project Infrastructure Footprint – Rascal/Goose Lake Diversion
Reference (Volume, Section, Page. Paragraph)	Volume 6, section 7.5.2.1 p7-38 and Volume 10, section 3.5.4 pg. 16, and Section 3.2.1, 2013 Freshwater Fish and Fish Habitat Baseline Report, pg. 3-187 to 3-193. And
Summary (include Sabina's conclusion if relevant and conclusions of commenting party)	Sabina's Conclusion: Diversion of water from the eastern channel of the northern-flowing drainage from Rascal Lake into Goose Lake will be diverted into the western channel which flows through Gander Pond. The water will be allowed to flow naturally and no diversion channels will be excavated, however the construction of berms may be required to divert the flow and constrain the combined flow in the existing channel. DFO's Conclusion: 2013 Freshwater Baseline data identified the presence of impassible barriers as well as areas with no defined channel. While this diversion may be suitable for water management purposes the viability of this option to provide fish habitat for the Arctic Grayling should be re-evaluated.
Importance of issue to Impact Assessment	The diversion of water away from the airstrip and the Goose Open Pit is an important component of the project. It is important to understand the impacts this diversion will have on Arctic grayling and whether the western channel will function as productive fish habitat.
Detailed Review Comment **1. Gap / Issue** **2. Disagreement with FEIS / Addendum Conclusion** **3. Reasons for Disagreement with FEIS / Addendum conclusion**	The DEIS does not provide information on the impact that this additional water would have on the ability of the existing channels to handle these flows and whether these additional flows would have negative impact on channel stability and result in increased erosion. The increased volume of water may also increase water velocities which may have a negative impact on fish passage and usage of the stream. Baseline data collection done in 2013 has shown that there are barriers in the western channel and a steeper gradient, as well as areas where there is no defined channel. 2013 Baseline data collection also showed that Arctic grayling spawning adults and fry were found only upstream of Gander Pond, thus suggesting the fish are coming downstream from Rascal lake and not upstream from Goose Lake. Therefore based on the new 2013 baseline data the suitability of this western channel to support Arctic grayling should be reassessed.

	An additional concern which would arise if the western channel was not suitable for Arctic grayling spawning is whether there are other suitable spawning streams for this population in the Goose and Rascal watersheds.
Recommendations	1. DFO recommends that Sabina re-evaluate the feasibility of diverting flows to the western channel of the Gander Pond Stream as an offsetting option. 2. DFO recommends that Sabina assess whether the Arctic grayling spawning and rearing habitat is limiting for the population which is currently using the Rascal –Goose and Main Goose Pit Streams to determine if this population of Artic Grayling would be lost if the water flow in these streams was diverted.

Comment Number	**3.1.3 Watercourse Crossings**
Subject / Topic	Watercourse Crossings
Reference (Volume, Section, Page. Paragraph)	Volume 10, section 3.5.1 pg. 14 and section 4.2. 11, Volume 2, section 6.4.3, pg. 6-7, Sabina response to DFO Information Request 3, Appendix G: Back River Project: 2013 Freshwater Fish and Fish Habitat Baseline Report.
Summary (include Sabina's conclusion if relevant and conclusions of commenting party)	Sabina has indicated all culverts will be designed to handle a 1 in 50 year storm event. Engineering Drawings will likely be provided prior to the technical meetings.
Importance of issue to Impact Assessment	Watercourse crossings have the potential to have a negative impact on fish, fish habitat and fish passage if they are not designed, sized and installed properly.
Detailed Review Comment **1. Gap / Issue** **2. Disagreement with FEIS / Addendum Conclusion** **3. Reasons for Disagreement with FEIS / Addendum conclusion**	In Sabina's response to DFO Information Request 3, they have indicated that culverts will be designed to handle 1 in 50 year storm events. Spring freshet in the Arctic can result in large volumes of water passing through waterbodies often over a very short period of time. It is important that the culvert is designed to handles these flows otherwise there is a risk that the culverts and the associated road will wash out. The fish passage design criteria for culverts often focuses on high flows, however low flows may prevent or delay fish passage particularly when flow is spread through multiple large diameter culverts. Low flow depth may affect both upstream and downstream movements and may lead to fish stranding as fish migrate back from rearing to over-wintering habitat.

Recommendations	1. DFO requests that Sabina provide the rationale for using the 1 in 50 year storm event for the sizing of the culverts. 2. DFO recommends that an assessment of fish passage for high, low and average flows also be included as part of the culvert design process.