

**ANNEX 2: Information requests directed to the proponent**

**Table 2: Comments and suggestions for information requests to be directed to the proponent**

IR Number (e.g. HC-IR-01)	Valued Component	Reference to EIS guidelines	Reference to EIS	Context and Rationale	Specific Question/ Request for Information
DFO-1	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.4 Baseline Conditions and 5.1.5 Determine Potential Effects	Volume 2, Part B Section 5.1 and Volume 4, Part G Section 22.0 Appendix 5.1-A and 5.1-B	The upper portion of Water Course 2 (WC2) is described only as rearing and overwintering habitat in section 5.1 and appendix 5.1-B, however in 5.1-A, the upper 20% of the channel is described as having riffle-glide habitat with suitable gravels for spawning salmonids. As well there are small sections of exposed gravels elsewhere in WC2 suitable for spawning. Adult spawner counts between 2004 and 2012 have resulted in observations of Chum, Coho and Pinks. Cutthroat Trout are also known to spawn in the upper reaches of WC2 though data has not been provided.	Characterize the salmonid spawning habitat within WC2 (upper and lower reaches) and describe how the loss of this habitat will impact the various VC populations within WC2 and recruitment to WC2.
DFO-2	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.4 Baseline Conditions	Volume 4, Part G Section 22.0 Appendix 5.1-A	Table 8 is stated to contain returning adult salmon counts from 2009-2013. The 2013 data has not been provided. It is unclear which reaches within WC2 were visually surveyed.	Clarify if any surveys for returning adult salmon were conducted in 2013 and if yes, provide survey data. Identify which reaches were visually surveyed and where the returning salmon were observed.
DFO-3	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.2.6 Mitigation	Volume 4, Part G Section 22.0 Appendix 5.1-B	The proposed offsetting for the loss of fish habitat within WC2 is the development of a rearing and overwintering channel below the pit lake. The channel is not intended to provide spawning habitat. The plan	To improve the adequacy of the proposed offsetting plan and to ensure sufficient recruitment to no loss in fish productivity in the species utilizing watercourse 2, spawning habitat to increase recruitment to

				calls for the placement of suitably sized spawning gravels over 10% of its length however no commitments to create spawning habitat have been created and the use of the gravels for spawning may be unlikely due to the slow moving, low gradient habitat in the current design. Spawning within watercourse 2 has only been identified in portions of the upper watercourse which would be lost as part of the project and at one bend within the lower watercourse. With the proposed loss of the upper spawning habitat there will be a loss of recruitment to the watercourse.	the proposed rearing channel and to offset for lost spawning habitat in upper watercourse 2 should be included in the offset plan. Offsetting options for the creation of spawning habitat downslope of the pit lake or in adjacent fish bearing watercourses should be considered. If no opportunities exist within or near the local study area, opportunities within the region could also be explored. Changes to the proposed channel design optimizing slopes and groundwater capture to increase velocities and to maximize groundwater upwelling may be beneficial.
DFO-4	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.5 Determine Potential Effects	Volume 2, Part B Section 5.1	Salmonid spawning has been observed at the bend in the lower segment of WC2, near MT6. This is the only stated spawning location in the lower reaches of WC2. Baseflows in lower WC2 are predicted to drop by 19% to 37%. Impacts to fish habitat in lower WC2 have only been described in the context of lost wetted width and generic instream habitat.	Flow reductions have the potential to reduce the quality and suitability of spawning habitat in a channel. Will the predicted 19% to 37% drop in base flows impact the quality or suitability of the spawning habitat in lower WC2? Will the flow reductions or changes in water characteristics (temperature, nutrients, dissolved oxygen etc.) impact egg to fry survival in WC2?
DFO-5	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.5 Determine Potential Effects	Volume 2, Part B Section 5.1	The creation of an outlet to the pit lake containment berm is not currently planned to occur until closure. At closure, the outlet is designed to connect to WC2 at the head of the proposed offset channel. Changes have recently been made by the Province to the criteria used in classifying berms and dams.	Given the recent changes to the Provincial regulations, will the pit lake containment berm be classified as a dam requiring an outlet or overflow structure? If yes, where will the outlet or structure be located and will there be any fish or fish habitat impacts resulting from the structure or the release of any overflow water?
DFO-6	<ul style="list-style-type: none"> <li>Fisheries</li> </ul>	5.2.6 Mitigation	Volume 2, Part B	Proposed mitigation includes	In order to evaluate the likely

	and Freshwater Habitat		Section 5.1	designing the pit lake in such a way that the lake elevation can be used to manage hydrostatic pressure through the course of operations so that changes to groundwater flow do not lead to a loss of flow within McNab Creek. As well, the elevation of the pit lake will be used to manage baseflows in the groundwater watercourses below pit lake. No outlet / overflow channel is currently planned for the pit lake during operations and lake inflows are groundwater, precipitation and surface runoff. As such, it is unclear at this time how the lake elevation will be managed.	effectiveness of the proposed mitigation, provide further details regarding how the pit lake elevation will be manipulated / engineered to “manage” the groundwater and base flows within McNab Creek and the groundwater channels below the pit lake? What conditions will trigger the pit lake elevation active management and what are the details of the proposed monitoring strategy to inform pit lake elevation management?
DFO-7	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.5 Determine Potential Effects and 5.2.6 Mitigation 5.1.4 Baseline Conditions	Volume 2, Part B Section 5.1 / Volume 4, Part G Section 22.0 Appendix 5.1-A and 5.1-B	Limited information on the groundwater flow patterns around the existing groundwater channels in the foreshore area and in the proposed mitigation area has been provided. The hydraulic properties of the sediments present in the area of the groundwater channels and foreshore below pit lake have not been described. More detailed baseline information and predictions are required to ascertain where the increased groundwater from the pit lake will discharge into the aquatic / marine environments.	An increase in ground water has been predicted in WC3 through WC5 and the estuary. As well, the proposed mitigation channel will rely on groundwater flow. It is unclear from the information provided, where this water will leave the ground and enter the watercourses, estuary and marine environment. A better understanding of where and how the ground water will be flowing into the aquatic and marine environments will assist in understanding mixing and potential effects. It is also unclear where the groundwater will be sourced (from the Pit Lake or deep groundwater), which could have implications on the temperature. Provide information on the depth and hydraulic properties of the sediments in the lower WC2 and

					mitigation area, including information on the recent back hoe dug test hole and logs of test holes located south of the hydro power line right of way. Provide a tabulation of current and predicted water sources and inflow quantities into, and from, the WC2 channel and the mitigation area channels. The sources to include Pit Lake and deep groundwater.
DFO-8	<ul style="list-style-type: none"> <li>Fisheries and Freshwater Habitat</li> </ul>	5.1.5 Determine Potential Effects 5.1.4 Baseline Conditions	Volume 2, Part B Section 5.1 / Volume 4, Part G Section 22.0 Appendix 5.1-A and 5.1-B	Limited information on seasonal water temperatures have been provided for the fish bearing watercourses downslope of the Pit Lake. Given the proximity to the Pit Lake and the ground water inputs that will likely be sourced from the Pit Lake, water temperature changes are likely to higher in the fall and lower in the spring. More detailed baseline information and predictions are required to identify and understand the magnitude of water temperature changes and any potential associated impacts to fish and fish habitat including egg to fry survival, growth rates and changes to the aquatic invertebrate and macrophyte communities.	Provide current and predicted post operation seasonal water temperatures in the WC2, WC3, WC4 and WC5 as well as the proposed mitigation rearing channels. Discuss any potential impacts (positive and negative) to the fish communities utilizing the watercourses including any changes to the habitat quality and food availability resulting from potential changes to the benthic macroinvertebrate and macrophyte communities.
DFO-9	<ul style="list-style-type: none"> <li>Marine Resources</li> </ul>		Volume 2, Part B Section 5.2	The groundwater contribution to the marine estuary (inactive fan) is anticipated to increase as a result of the proposed pit lake. The locations of where the groundwater is expected to upwell have not been identified / modelled. An increase in	Describe any impacts or risk associated with the increased ground water flow and associated hydrostatic pressure on the stability of the sediments and slopes in the marine estuary, the potential for movement and any associated

				groundwater may result in an increase in the hydrostatic pressure in the subsurface. With only limited information on the geology and groundwater flow patterns, there is insufficient information to determine if there is a risk the increased hydrostatic pressure could impact the stability of the inactive fan forming the marine estuary.	impacts to fish and fish habitat?
DFO-10	<ul style="list-style-type: none"> <li>Marine Resources</li> </ul>	5.1.5 Determine Potential Effects	Volume 2, Part B Section 5.2	The EIS states that the barging route overlaps with the glass sponge reef at the mouth of Ramillies Channel. No other sponge reefs (glass sponge or otherwise) have been identified by the proponent in the proximity of the project. At the public information sessions held Sept. 12-13, 2016 several members of the public expressed concern for cloud sponge reefs close to the proposed project infrastructure.	In order to ensure all potential effects have been considered, identify the location of the closest known sponge reefs in relation to the project area. Given the location, depth and distance to the project will there be any potential effects and if so, what?

*ANNEX 3: Advice to the proponent*

**Table 3: Additional advice to the proponent, such as guidance or standard advice related to your departmental mandate**

Departmental number (e.g. HC-01)	Reference to EIS	Context and Rationale	Advice to the Proponent
DFO-1	<ul style="list-style-type: none"> <li data-bbox="443 532 926 589">Fisheries and Freshwater Habitat and Fish and Fish Habitat Baseline Report</li> </ul>	<p data-bbox="951 532 1310 751">The baseline data provided for the fisheries and freshwater habitat sections and associated appendices was collected between 2009 and 2012. This information is four plus years old and is becoming outdated.</p>	<p data-bbox="1335 532 1818 1076">Typically fisheries related baseline data should not be more than five years old. The majority of baseline data in the fisheries section was collected between 2009 and 2012. If this project proceeds to the regulatory phase, updated fisheries baseline data (adult spawner counts, fish abundance surveys etc.) would be required in WC2 through WC5 and McNab Creek to adequately characterize localized effects, serious harm, to be used as the basis for developing offsetting effectiveness metrics and in support of the follow up effects monitoring. Current fisheries data from both even and odd years would be warranted given the nature of the pink salmon spawning runs in the area.</p>