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Qikiqtani Inuit Association

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October 25, 2021

Assol Kubeisinova
Technical Advisor, Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
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RE: QIA Updated Technical Comments - Baffinland Iron Mines Corporation's Type 'A' Water Licence 2AM-MRY-1325 Amendment 2

Dear Assol Kubeisinova,

Baffinland Iron Mines Corporation (Baffinland) submitted an updated Amendment 2 package for the Type 'A' Water Licence 2AM-MRY-1325 (the Licence) to the Nunavut Water Board (NWB) on September 17 and 23, 2021. On September 24, 2021, the NWB requested that intervenors submit updated Technical Comments on or before October 18, 2021. This deadline was extended to October 25, 2021 following a request for an extension from the Qikiqtani Inuit Association (QIA).

QIA has diligently reviewed Baffinland's submission and provides its updated Technical Comments in the attached appendix. These Technical Comments are inclusive of previous QIA submissions and incorporate responses provided by Baffinland on August 23, 2019 as well as commitments on the record for parallel regulatory processes.

QIA looks forward to discussing this submission at the upcoming Technical Meeting in Iqaluit on November 12, 2021.

Sincerely,

Chris Spencer
Manager, Regulatory Affairs

cc: Lou Kamermans, Baffinland Iron Mines Corporation

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Appendix: Updated Technical Comments – Phase 2 Water Licence Application

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Updates to Technical Comments Submitted on July 15, 2019

Land Reclamation and Water Compensation

Technical Comment	**1. Inuit Owned Land (ICRP)**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP
Issue/Concern	1.1 Baffinland's May 2019 submission of the Interim Reclamation and Closure Plan (ICRP) has not yet been approved by QIA through the Commercial Lease. QIA can provide an update on this approval process as requested by the NWB; however, QIA will manage the ICRP through the Commercial Lease and not the Water Licence Process.
Status (October 25, 2021)	Unresolved. QIA and Baffinland have exchanged feedback on the Phase 2 ICRP. At this time, QIA has not approved the current version of the ICRP submitted as part of the Amendment 2 package.

Technical Comment	**2. Inuit Owned Land (Security)**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP
Issue/Concern	2.1 QIA will work with Baffinland through the Commercial Lease on all matters related to security for Inuit Owned Land. QIA can provide an update on this approval process as requested by the NWB.
Status (October 25, 2021)	Resolved. QIA is satisfied with Baffinland's August 23, 2019 response.

Technical Comment	**3. Water Compensation Agreement**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-2-Applic
Issue/Concern	The current water compensation agreement (WCA) does not cover Phase 2. Phase 2 is a change to the Project as defined by condition 7 of the current WCA. Therefore, a new WCA or an amendment is required. 3.1 Baffinland should be required to come to a new agreement with QIA prior to the amendment being issued as per Article 20.3.1 of the Nunavut Agreement.
Status (October 25, 2021)	Unresolved. QIA and Baffinland have agreed to work together to develop a revised Water Compensation Agreement for the Phase 2 Project. An agreement has not been established at this time.

Technical Comment	**4. Inuit Water Use**
Reference	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 08MN053_BAF-PH1-830-P16-0008_Environment-Protection-Plan-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE

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Issue/Concern	The specifics of Baffinland's use of Inuit Qaujimajatuqangit in developing its monitoring and management plans is not clear. Page 15/43 of the railway operations plan states the following: *Inuit Qaujimajatuqangit and traditional knowledge have been incorporated into an appropriate design for caribou crossings, by softening the embankment side slopes to an acceptable grade and providing a surface treatment that will make the crossings more accessible to the caribou. Where identified caribou trails will be interrupted by substantial cuts in steeply sloped rock, these will be treated on a site-by-site basis.* It is uncertain how the Environmental Protection Plan, Surface Water and Aquatic Ecosystems Management Plan (SWAEMP) and the Aquatic Effects Monitoring Plan (AEMP) have considered Inuit Qaujimajatuqangit or Inuit's use of water. 4.1 Provide the specifics of how Inuit Qaujimajatuqangit was and will be used and considered in the development of the North Railway, its location, the crossings, and the relevant management and monitoring plans. 4.2 Provide monitoring locations along the proposed North Railway that align with Inuit use.
Status (October 25, 2021)	Deferred. This Technical Comment is now addressed by TC 26-33.

Environmental Management

Technical Comment	**5. Fish and Physical Effects of Flow Diversion**
Reference	Fish Passage Risk Assessment Update (KP Ref VA19-00838)
Issue/Concern	On page 13/37, Knight Piesold makes the following statement: *Monitoring and adaptive management will also be conducted.* 5.1 When will the monitoring and adaptive management plan related to flow diversion be shared for review and comment?
Status (October 25, 2021)	Unresolved. This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.

Technical Comment	**6. Management and Monitoring Plans – North Railway**
Reference	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2
Issue/Concern	Table 2-1 states that management of water quality impacts for the North Railway for stream crossing blockages, slides, and erosion is included in the Railway Operation and

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	Maintenance Management Plan. However, no further information is provided within the plan regarding mitigation and monitoring for water quality issues related to these areas. 6.1 This plan or another should be resubmitted with the monitoring and mitigation measures to be taken for the construction and operations of the North Railway. This should include adaptive management.
Status (October 25, 2021)	Unresolved. This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.

Technical Comment	**7. Management and Monitoring Plans – Referencing Confusion**
Reference	Multiple, for example: 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	References from one management plan to another without specific indication on where to look in the referenced management plan creates uncertainty for reviewers and could be difficult for operators to use. Additionally, there are times when no new information is present or obvious, or the reference is circular. The onus for clarity should be on Baffinland, and not the reviewer. Two examples of this are as follows: Example 1: Table 2-1 of the Railway Operation and Maintenance Management Plan establishes itself as the plan responsible for the management of water quality impacts for the North Railway for stream crossing blockages, slides and erosion. However, no further information is provided within the plan regarding mitigation and monitoring for water quality issues related to these areas. Example 2: The Surface Water and Aquatic Ecosystem Management Plan, on page 31/66 states: *Mitigation measures at Milne Port will include periodic site inspections, as outlined in Baffinland's Environmental Protection Plan…* When reviewing the Environmental Protection Plan, there is no clear indication of where a Milne Port site inspection would be discussed. Table 10-1 in the SWAEMP would be a better reference to provide the reader. 7.1 Baffinland should be required to update all DRAFT management plans so that all references are clear and easy to access. At a minimum, references should include the section headers or section numbers.
Status (October 25, 2021)	Unresolved. QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.

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Technical Comment	8. Management and Monitoring Plans
Reference	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	On page 32/66 Baffinland states the following: *Scheduled monitoring of water quality, water quantity and fish passage at water crossings along the Tote Road, as detailed in Section 10 of this Plan, will be used to inform and prioritize Tote Road maintenance activities and surface water drainage improvements*. Section 10 lists multiple monitoring activities to be completed by Baffinland but lacks detail of how the monitoring activities will prioritize maintenance activities or the frequency at which these monitoring activities will be assessed to inform maintenance activities. 8.1 Resubmit the SWAEMP and include the frequency of the assessment of monitoring activities listed in Section 10 and how this will inform and prioritize maintenance activities.
Status (October 25, 2021)	Unresolved. This concern remains outstanding until thresholds are developed for Fish Passage.

Technical Comment	9. Management and Monitoring Plans
Reference	Multiple, including: 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	Baffinland is requesting approval of management plans with acknowledged missing information in the form of recommendations or with the intention that it will be updated in the future. Stating that information will be provided in the future is not an acceptable placeholder for information; reviewers require this information to assess the adequacy of the plan. For example, in section 10.2.3 Baffinland states: *Surface water and aquatic ecosystem monitoring programs specific to the North Railway focus on monitoring requirements stipulated by Baffinland's Type A Water Licence, DFO authorizations for water crossings, and fulfilling commitments made to stakeholders and regulators.* This statement indicates the plan is missing information that could be further detailed as to what Baffinland intends to do. A second example is that SWAEMP section 10.2.3.1 Construction Monitoring indicates the *water withdrawal site BG32 is recommended in the first year following Project approval*. 9.1 Resubmit DRAFT plans and use language for what Baffinland will do should the Project be approved rather than delaying detail or recommending actions be taken.
Status (October 25, 2021)	Unresolved.

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	QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.

Technical Comment	**10. Management and Monitoring Plans**
Reference	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2
Issue/Concern	On page 32/66 of the SWAEMP, Baffinland states the following: *The Road Management Plan describes mitigation for managing dust along the Tote Road, including the application of water as well as calcium chloride and water. Calcium chloride will be applied in accordance with applicable guidelines to minimize runoff into local watercourses.* 10.1 Present the how, where and to what frequency is calcium chloride monitored to remain in accordance with applicable guidelines to minimize runoff into local watercourses. 10.2 Provide the applicable guideline used to minimize runoff into local watercourses.
Status (October 25, 2021)	10.1 Resolved. Monitoring of calcium outlined in Appendix G and H of the SWAEMP is sufficient assuming no evidence of unexpected effects associated with calcium are identified. If unexpected effects are identified, monitoring will need to be adequately modified through the adaptive management process. 10.2 Resolved. QIA is satisfied by the response provided by Baffinland on August 23, 2019.

Technical Comment	**11. Management and Monitoring Plans – North Railway**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm
Issue/Concern	On page 44/202, Baffinland states: *A detailed monitoring program will need to be designed and established as part of the instrumentation and monitoring with additional measures taken as part of the adaptive management approach. This strategy is also used to manage proper remedial actions for other cases where there may be potentially unforeseen warmer conditions encountered in the area.* 11.1 The Water Licence should require Baffinland to monitor the construction, operations and closure of the North Railway. 11.2 The Water Licence should require Baffinland to provide the monitoring program prior to any construction approvals for the North Railway is provided.
Status (October 25, 2021)	11.1 Unresolved.

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	This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway. 11.2 This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence.

Technical Comment	**12. Management and Monitoring Plans – North Railway**
Reference	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2
Issue/Concern	On page 25/43 Baffinland states the following: *Records of inspections and corrective actions will be kept by the Railroad Infrastructure Department.* 12.1 These records should be provided to reviewers as part of Baffinland's reporting requirements under the Water Licence. 12.2 Baffinland should be required to disclose the triggers that result in corrective actions being taken. 12.3 Baffinland should be required to update the NWB and reviewers on the effectiveness of the corrective actions.
Status (October 25, 2021)	12.1 Unresolved. This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence. 12.2 Unresolved. This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway. 12.3 Resolved. QIA is satisfied by the response provided by Baffinland on August 23, 2019.

Technical Comment	**13. Management and Monitoring Plans**
Reference	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	On page 32/66 Baffinland states the following: *The requirement and selection of effective sedimentation and erosion controls to be employed at areas along the North Railway* will *be subject to Project authorizations and applicable DFO guidance and informed by in field monitoring and site experience.* There is no reference to another management plan or document where additional relevant information may be found.

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	13.1 Provide figures that detail the field monitoring proposed to be completed as part of the construction, operation and closure of the North Railway. 13.2 Provide additional details based on Baffinland's current experience from developing a mine with a linear transportation corridor (over 5 years) that would inform the selection of effective sedimentation and erosion controls along the North Railway.
Status (October 25, 2021)	13.1 Unresolved. QIA believes that Table 5.1 should include monitoring activities during closure of the north railway. 13.2 Resolved. Erosion control measures are detailed with installation locations noted, which may be applied to either road or rail water crossings.

Technical Comment	**14. Management and Monitoring Plans**
Reference	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2
Issue/Concern	On page 26/83, Baffinland states the following: *Observations and recommendations made by the Professional Geotechnical Engineer and the Professional Fisheries Biologist in concert with the post-construction water quality monitoring results will be used by Baffinland to determine and prioritize any corrective actions and future upgrades to the Project road network.* 14.1 Provide the severity of the concern that requires immediate action be taken by Baffinland. 14.2 Provide the frequency at which Baffinland would determine and prioritize any corrective actions to the Project road network. 14.3 Provide what would trigger Baffinland to construct the approved Tote Road to the 2014 Hatch design.
Status (October 25, 2021)	14.1 & 14.2 Unresolved. Appendix C was not provided by Baffinland to verify if any changes were made to address this comment. 14.3 Unresolved. Baffinland has indicated that a response to this concern is contingent on the NIRB's review of TRC 22 as part of the "Phase 2 Proposal" assessment.

Technical Comment	**15. Management and Monitoring Plans - North Railway**
Reference	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2
Issue/Concern	On page 24/43 Baffinland states the following:

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	Instrumentation will be located at select locations along the North Railway line to target areas identified as being at higher risk of future settlement and instability risk. A preliminary inventory of rail condition monitoring equipment and locations has been developed. This will predominantly address monitoring during the construction stage and the information gathered during construction will be used to finalize the operational condition monitoring plan. 15.1 Provide the target areas identified as higher risk and validation for this assessment. 15.2 Provide what additional information will be gathered prior to construction of the North Railway and how that information will be used to inform the construction of the North Railway. 15.3 Provide how the information gathered during the construction of the North Railway will be used to finalize the operational condition monitoring plan. 15.4 Provide the inventory of rail condition monitoring equipment and locations.
Status (October 25, 2021)	15.1, 15.2 and 15.4 Resolved. Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan. 15.3 Unresolved. Triggers, Actions and Thresholds have yet to be established for geotechnical monitoring criteria.

Technical Comment	**16. Adaptive Management**
Reference	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	The use of triggers to implement mitigative measures are a foundation of adaptive management. Triggers based on monitoring data are used to avoid the exceedance of water quality criteria and potential impacts to the receiving environment. The submitted monitoring and management plans are not clear on the difference between a monitored activity and one that would trigger a mitigative action. For instance, the SWAEMP has numerous mitigative measures in Section 6.4.3 Generic Erosion and Sediment Control Measures but there lacks an indication of what monitoring data thresholds would be considered to trigger the use of such mitigation measures. Attachment 1 includes the general monitoring conducted by Baffinland extracted from Section 10 of the SWAEMP. 16.1 Present the triggers based on monitoring data listed in Attachment 1, that will be implemented to mitigate against an exceedance of a water quality criteria, relevant thresholds, and potential impacts to the receiving environment. As committed to by Baffinland in the NIRB process, QIA is willing to work with Baffinland through updating its adaptive management included in monitoring and management plans. 16.2 Update all applicable water quality monitoring plans to include triggers, based on monitoring data, and to implement the mitigation measures to avoid exceedance of water quality criteria, relevant thresholds, and potential impacts to the receiving environment.

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	16.3 Describe how the proposed measures will mitigate the occurrence of an exceedance to water quality criteria.
Status (October 25, 2021)	16.1 Unresolved. This concern remains outstanding until thresholds and responses are developed to include all analytical water quality monitoring parameters. 16.2 &16.3 Unresolved. This information has not yet been incorporated into the relevant management plans.

Construction and reporting

Technical Comment	**17. Fish and Physical Effects of Flow Diversion**
Reference	Fish Passage Risk Assessment Update (KP Ref VA19-00838)
Issue/Concern	On page 12/37, Knight Piesold makes the following recommendation: *Site specific assessments should be undertaken at this diversion during detailed engineering design of the railway. The assessments should consider fish use and length of impacted channel, and potential mitigation options can be identified and incorporated into the final design.* 17.1 Is Baffinland committed to completing these recommendations? If yes, when will the assessment and detailed design be shared for review and comment?
Status (October 25, 2021)	Refer to TC 24 1.4.

Technical Comment	**18. Fish and Culvert Passage**
Reference	Fish Passage Risk Assessment Update (KP Ref VA19-00838) 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE
Issue/Concern	On page 11/37, Knight Piesold makes three recommendations regarding fish passage and impact mitigation: *Install at least one culvert at each fish bearing crossing as an embedded culvert, such that slope, bed material and discharge per unit width are sufficiently comparable to upstream and downstream conditions. A Qualified Professional (QP) with sufficient experience and training should supervise design and installation.* *At the highest risk crossings, site-specific assessment (e.g. assess baseline depths, velocities and discharge, channel morphology and fish use) will be conducted. If required, site-specific design and construction (e.g. embedded box or arch culverts, or fish passage culverts) will be used to mitigate risk.* *A monitoring program will be developed to monitor conditions at the highest risk crossings.*

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	18.1 Is Baffinland committed to completing these recommendations? If yes, when will the monitoring program be shared for review and comment? 18.2 Given this statement can Baffinland explain why the North Railway did not cause greater changes to the AEMP? Please also consider the North Railway involved almost 400 stream crossing and 30 new quarries.
Status (October 25, 2021)	18.1 Deferred. Refer to TC 24 1.4 18.2 Unresolved. This concern remains outstanding until triggers from the SWARMP regarding the North Railway are captured in the AEMP.

Technical Comment	**19. Construction – Erosion and sedimentation**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm
Issue/Concern	On page 41/202, Baffinland states: *Any issues related to erosion and sedimentation occurring along the ditches and the railway route will be reported, and medial measures will be taken to minimize further impact.* 19.1 These reports should be included in Baffinland's reporting to NWB. 19.2 Provide the measures and what are the specific triggers to action them.
Status (October 25, 2021)	19.1 Unresolved. This concern remains outstanding until reporting criteria inclusive of sedimentation monitoring is provided in the amended Water Licence. 19.2 Resolved.

Technical Comment	**20. Construction – Initial Conditions**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 2AM-MRY1325 Baffinland Iron Mines Revised Run of Mine Stockpile and Sedimentation Pond Issued For Construction Drawings
Issue/Concern	On page 42/202, Baffinland states: *However, it is essential that samplings of overburden soils will be completed to determine the permafrost conditions encountered at the site, including potential ground ice or thick ice bodies.* The importance of this work was just exemplified by Baffinland's construction approval resubmission for its Run of Mine Stockpile and Sedimentation Pond.

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	20.1 This work should be completed and provided by Baffinland prior to any construction approvals for the North Railway deviation is provided.
Status (October 25, 2021)	20.1 Deferred. Refer to TC 24 1.4

Technical Comment	**21. Construction – Slope Stability**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm
Issue/Concern	On page 43/202, Baffinland states: *Embankment cut test sections may be subjected to observation and monitoring to confirm the method of excavation, cut slope stability performance, as well as performance of the embankment fill built in cut sections, such as settlements, and slope stability.* 21.1 The Water Licence should require Baffinland to complete and report on embankment cut test sections. The reporting should describe how the results were included in final designs. This work should be completed and provided by Baffinland prior to any construction approvals for the North Railway is provided.
Status (October 25, 2021)	21.1 Unresolved. This concern remains outstanding until further detail is provided in either the North Railway Monitoring Program or the mentioned drone-based monitoring program.

Technical Comment	**22. Construction – Settlement**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm
Issue/Concern	On page 42/202, Baffinland states: *As part of maintenance, additional insulation or soil cover will be provided in areas showing increased settlement beyond expectations. Aerial assessments will be undertaken to find standing water or other features on the ground and adjacent areas.* 22.1 Additional details regarding the frequency, and extent of the aerial assessments is requested. 22.2 A specific trigger for when additional insulation is required should be considered in the Water Licence. 22.3 The Water Licence should require Baffinland complete the aerial assessments committed to and report upon them.
Status (October 25, 2021)	21.1, 22.2 and 22.3. Unresolved. This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.

Technical Comment	**23. Adaptive Management – SWAEMP**

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Reference	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE
Issue/Concern	On page 49/66, Baffinland states: *Four of the diversions are considered medium or high risk, and one of the streams (CV59-4) is probably fish habitat. Site specific assessments will be undertaken at these diversions during detailed engineering design of the railway. The assessments will consider fish use and length of impacted channel. one of which may result in meaningful changes in flow in the receiving stream that may affect stream morphology downstream. Adaptive management can be used to address any unexpected effects. Where diversions are considered high or moderate risk of causing measurable change to channel morphology and sediment transport, design mitigation measures can be used to address the identified risks. Options for mitigation may include:* *• Channel widening* *• Regrading* *• Construction of habitat features (in fish bearing streams)* *• Channel stabilization* *Monitoring and adaptive management will also be conducted, if deemed necessary.* 23.1 Provide what monitoring would be conducted that could lead to mitigation measures. 23.2 Provide the monitoring values that would trigger mitigation measures. 23.3 Provide reasoning when monitoring and adaptive management would not be needed during and post construction.
Status (October 25, 2021)	23.1 & 23.2 Unresolved. Refer to 8.1 and 10.1. 23.3 Unresolved. QIA is engaged with Baffinland in improving current adaptive management processes as part of a separate regulatory process. QIA will provide an update on this TC when available.

Technical Comment	**24. Construction – Stream Crossings**
Reference	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE
Issue/Concern	There are approximately 395 stream crossings for the North Railway. Several typical design drawings have been provided for the 450 culverts, but additional site-specific construction plans have not been included. 24.1 The NWB should develop a new Part of the amended Water Licence devoted to stream crossings, the construction of the North Railway, and subsequent reporting requirements. At a minimum this should consider the following: 24.1.1 Environmental monitoring for construction 24.1.2 Construction QAQC programs for the North Railway 24.1.3 Infield design change reporting

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	24.1.3 North Railway As-Built reporting on time frequency basis 24.1.4 A construction sequence 24.2 This new Part should also provide requirements for construction reporting. 24.3 QIA is willing to work through the NWB process and review to support the development of draft terms and conditions.
Status (October 25, 2021)	24.1 Unresolved. This TC remains unresolved until applicable reporting criteria are included. 24.1.1 Unresolved. This concern remains outstanding until reporting criteria for monitoring during construction of the North Railway is included. 24.1.2 Unresolved. This concern remains outstanding until quality control considerations of the North Railway are included in Part D, with inclusion of reporting criteria. 24.1.3 Unresolved. This concern remains outstanding until reporting of in field design changes for construction of crossings along the North Railway are included in Part D. 24.1.4 Unresolved. In addition to recommendation 24.1, it is requested that as-builts for sections of the North Railway are provided on a more frequent basis (e.g., quarterly). 24.2 Unresolved. Refer to 24.1.4. 24.3 Resolved. QIA is in agreement with Baffinland August 23, 2019 response.

Technical Comment	**25. Construction – Engineered mitigation and design**
Reference	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2
Issue/Concern	The Baffinland's history indicates it is prone to change. For example, the Tote Road is not built to the approved ERP design and the mine plan has changed multiple times since its

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	initial approval in 2014. More recently, as stated by Baffinland on page 49/66 of the SWAEMP: *It should be noted that changes in the design of the North Railway since publication of the FEIS Addendum for the Phase 2 Proposal has resulted in a raise of the embankment and elimination of most of the previously identified rock cuts. Most of the previously identified diversions have been eliminated. Revised hydrological modelling is currently underway to re-assess this issue.* Changes in the Project creates uncertainty and difficulty for reviewers to understand the scope of the project and the related mitigation and monitoring. This may explain the Baffinland's statement on page 24/43 of the Railways Operations and Maintenance: *A plan is in development for long term monitoring and maintenance of the rail alignment. This monitoring plan includes the installation of thermistors and inclinometers, along with other measurement measures.* 25.1 Provide a timeline for the completion of modelling; additional testing; final design; and final approval of the North Railway. 25.2 Baffinland should be required to provide bi-weekly reports during the construction of the North Railway that outline any deviations from the approved construction drawings. 25.3 Provide a timeline for delivering the North Railway long term monitoring and maintenance plan for review, comment, and approval.
Status (October 25, 2021)	25.1 Resolved. QIA is of the understanding that Baffinland is now solely seeking approval for the construction of Route 3. 25.2 Unresolved. Refer to 24.1.4 25.3 Unresolved. QIA has not yet received a copy of the draft long term monitoring plan.

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New Technical Comments

(Inclusive of QIA's October 25, 2019 submission)

Inuit Engagement and Integration of Inuit Qaujimanituqangit

Technical Comment	**26. Engagement with Inuit Communities**
References	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board. No Date. "Draft Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3)". [Available on request from NWB] • Nunavut Water Board. No Date. "Draft Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, trainings, flood control, diversions, and flow alterations) (M1)". [Available on request from NWB] • 190502 2AM-MRY1325 Amend2 Applic-Att-3.2-SIG-Concord-ILAE • Nunavut Water Board. 2004. "Draft Guide for Community Consultation and Public Participation". [Available on request from NWB] • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • FEIS Addendum TSD 04 Public Consultation • 210917-2AM-MRY1325-Amend2-Applic-Att-2.2-Main-Rpt-IAAE
Issue/Concern	The Nunavut Water Board's Draft Guide for Community Consultation and Public Participation recommends that Proponents/Developers engage, "directly with communities in order to improve their application process, particularly as it relates to possible compensation issues" (Page 13 of 27). Question 20 in the Water Licence Amendment Application requests a summary of "any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns" (Page 14 of 17). The Supplemental Information Guidelines (SIG) for Mining and the SIG for General Water Works also require a list of concerns expressed and measures to address those concerns. In response to question 20 in the Amendment Application (Page 14 of 17), the Proponent notes that consultation information for the application is provided in the FEIS Addendum for the Phase 2 Proposal. In addition, in the SIG concordance table, the Proponent notes that the consultation record is located in TSD 04 sections 3 and 4 (Page 7 of 24). In reviewing TSD 04 it is unclear at what meetings Water was discussed, what information on the water licence was presented to communities, and what questions specific to water were asked. In their response to QIA 4.1, the Proponent also notes that Community Risk Assessment Workshops and Crossing Selection Workshops were conducted (Page 12 of 19), however, it is unclear what concerns were raised in relation to water use, water quality, and water flow at these workshops. In addition, QIA has flagged directly with Baffinland, concerns that the Proponent's inability to find any waterbodies of unique or cultural significance in relation to the Project is much more likely linked to inadequate data collection than to any absence of elevated value for

	Inuit of waterbodies potentially (and in some cases, already) impacted by the Mary River Project. QIA is working with Baffinland to identify additional ways in which Inuit values related to water can be identified, monitored against, and managed for, and will report on progress in these efforts to the NWB during the Water Licence review (see also Comment #27 below). In the Main Report for the Application the Proponent claims that, "Baffinland believes that the terms and conditions of the existing Water Licence 2AM-MRY-1325 are satisfactory to cover the scope of proposed amendments under the Phase 2 Proposal" (Page 22 of 69). QIA is concerned that there is not presently enough information to inform whether existing terms and conditions have been adequate to address Inuit concerns to date, let alone any proposed changes to the Project. Until further community engagement concerning water is conducted, the assertion that no further terms and conditions is required cannot be confirmed. To resolve these concerns, QIA requests the following: 26.1 Please describe all community and other meetings where water and or the water licence amendment were a central topic of discussion. Please also include copies of any plain language materials on the Water Licence Amendment provided at those meetings. 26.2 As required by the SIGs, please list all Inuit concerns to date associated with water and how BIMC intends to mitigate those concerns. 26.3 Please describe any forthcoming opportunities provided by BIMC for Inuit communities to provide comment and raise their concerns on Water Licence Amendment changes. 26.4 Baffinland commit to expedite work with QIA and the Inuit communities to identify additional water-related values data collection, monitoring, thresholds of acceptable change, and adaptive management mechanisms.
Status (October 25, 2021)	*This Technical Comment was originally submitted on October 25, 2019. QIA has not received a response from Baffinland at this time. Regardless, this Technical Comment has been updated to reflect new information shared with QIA through various regulatory processes.* 26.1 – 26.4. Unresolved. Relevant activities related to this topic that have occurred in the interim include: • QIA has been working with Pond Inlet on an IQ study on Inuit water values in relation to the Mary River Project. This work is being funded by Baffinland. An update on the status of this work and its implications for the water licensing process can be provided at the technical meeting on November 12, 2021. • QIA has also initiated work to develop Inuit OITR's and a Culture, Resources and Land Use Monitoring Program.

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	QIA notes that Baffinland is now committed to Route 3 for the North Railway and provides more information on this in its updated Water Licence filings. In the Main Report, at pg. 7 of 65, Baffinland states that the shift to Route 3 was "in response to community feedback". It is not clear what community feedback this was or the status of Inuit parties' support for Route 3. Nor is it clear from the updated filings what IQ has informed this choice and what remaining Inuit concerns there are related to the routing of the North Railway.
Supplemental Requests (October 25, 2021)	26.2.a. Baffinland to provide an updated list of all Inuit concerns to date associated with water, including from the Tusaqtavut reports for the five impacted communities, Inuit submissions on the public record for the NIRB Phase 2 process, and from the NIRB hearing transcripts. 26.5 Baffinland to provide more information on remaining Inuit concerns with the proposed Route 3 for the Northern Railway, how IQ informed Baffinland's move to prefer Route 3, and what form of verification of Route 3 as a preferred route for Inuit has been completed by Baffinland.

Technical Comment	**27. Inadequate Inuit Qaujimanituqangit (IQ) Baseline Data Collection**
References	• 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-23-FWSWMP-Part1-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-Part1-ILAE • Knight Piesold. November 2018. "Mary River Project – Fresh Waterbodies with Unique Value and/or Cultural Significance to Inuit". [filed on the NIRB Mary River Project Phase 2 EA public record by Baffinland in response to Health Canada Technical Comments, as HC 02 Attachment 2 from the Advance Technical Comment Submission (Jan 2019)]. • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • Appendix C Water Take Assessment IN FEIS Addendum TSD 13 Surface Water Assessment, Pages 113 to 124 of 173. • 190502 2AM-MRY1325 Amend2 Applic Att-13.1-Fish-Interact-Rpt-ILAE • 190502-2AM-MRY1325 Amend2 Applic-Att-13.2-2018-Fish-Baseline-Rpt-ILAE • 190823-2AM-MRY1325-mrp2-Att-04-Stream-Diversion-Culvert-Fish-Passage-Assessments • NIRB Document 210621-08MN053 QIA Tusaqtavut Study (for Artic Bay and Clyde River) – Parts 1 through 6 (Accessible at NIRB Website) • 210917-2AM-MRY1325-Amend2-Applic-Att-16-Water-Withdrawal-Plan-Pt1of4-IAAE (and the subsequent 3 additional "parts" of this Water Withdrawal Plan) • 210917-2AM-MRY1325-Amend2-Applic-Att-13.2-2018-Fish-Baseline-Rpt_Part1-IAAE (and the subsequent 10 additional "parts" of this Fish Baseline Report) • 210917-2AM-MRY1325-Amend2-Applic-Att-1-Exec-Summ-IAAE.pdf • 210917-2AM-MRY1325-Amend2-Applic-Att-2.2-Main-Rpt-IAAE • NIRB Document Qikiqtani Inuit Association's Tusaqtavut Study Specific to the Baffinland Mary River Project Phase 2 for the Communities of Igloolik and Hall Beach, dated September 26, 2019 (available at NIRB Website)

	• NIRB Document Tusaqtavut for Phase 2 Application of the Mary River Project (for the Community of Pond Inlet), dated June 11, 2019 (Available at NIRB Website)
Issue/Concern	The Draft Surface Water and Aquatic Ecosystems Management Plan (SWAEMP) states that, "Long-term downstream users (i.e., local residents) have not been identified; however, there is potential for incidental water-use by hunters and visitors on adjacent lands."(Page 14 of 66). QIA is extremely concerned by this statement as it suggests an underestimation by the Proponent as to the values and uses tied to water by Inuit in the Project affected area. Water use by Inuit from the land is essential, not incidental. Inadequate collection and consideration of IQ in the development of the hydrological and Fish and Fish Habitat Baseline has led to this erroneous assumption. **Identification of Waterbodies of Heightened Importance** In BIMC's response to QIA TC#4.2, the proponent indicates that there are no waters "important to Inuit in the vicinity of the Tote Road and Railway" (Page 13 of 19). QIA has reviewed the Knight Piesold review process to identify waterbodies of unique and/or cultural significance (from the November 2018 memo noted in the response to TC #4.2) and found that it was data deficient and therefore not adequate to support a finding that there are no waterbodies of unique and/or cultural significance (or "heightened importance") in the Project-affected area. Any lack of a current list of waterbodies that are of heightened importance to Inuit is likely due to a lack of a full and targeted investigation rather than a lack of their existence. The Water Licence Amendment Application and the FEIS Addendum have not included the Identification of Inuit preferred Waterbodies/Waterbodies of heightened importance as part of the assessment. Of particular concern is that Inuit were not demonstrably included and Inuit water values were not demonstrably considered in the selection of the 13 additional water sources for water withdrawals. The methods of assessing lakes and streams for water withdrawals described in Sections 2.3 and 2.4 in Appendix C of TSD 13 do not include consideration of IQ/Inuit perspectives. No evidence has been provided that Inuit were asked whether any of the 20 source locations assessed had any cultural significance, nor does it appear that Inuit were involved in setting minimum flow thresholds. **Identification of Fish Habitat** The Application Main Report and supporting documents do not provide evidence that Inuit were involved or IQ was considered in assessing waterbodies for fish habitat. Documents 13.1 Fish interaction report, 13.2 fish baseline report, and Attachment 4 to the technical comments Stream Diversion Culvert Fish Passage Assessment, all note scientific methods for assessing presence of fish and fish habitat including Catch Per Unit Effort but do not include metrics for Inuit identification of fish habitat or Inuit catch effort. The Qualitative Habitat rating discussed in section 2.1.3 in the Fish Interaction Report (Page 7 of 70) also does not appear to be informed by IQ. This is of concern to QIA as Inuit communities have raised concerns in meetings documented by the Proponent for the Mary River Project

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	Phase 2 expansion EA, that there are fish everywhere in the Project affected area including small streams and creeks. The Main Report of the Application identifies that there are ~355 watercourse crossings that are not fish-bearing (Page 24 of 69). This claim needs to be verified by IQ holders, especially as the SWAEMP indicates that construction and operational activities preventing and/or restricting the movement of water will only be prohibited in streams and rivers identified as fish bearing (See Draft SWAEMP, Page 16 of 66). **Identification of Inuit Water Use and Values** In general, the Application main report and supporting documents does not indicate robust attempts by the Proponent to collect updated baseline and trend-over-time information, including IQ, for Inuit defined water values, effects identification and or thresholds. This lack of consideration is also a missed opportunity as the Proponent identifies that, “A long term hydrological record does not exist for the North Baffin Region” (AEMP Page 47 of 148). Consideration of IQ would help address the gaps in long-term data and help to understand change over time, including but also far beyond improving understanding of hydrology. Inuit insights on fish health and factors that influence it, important elements of drinking water safety, location-specific willingness or unwillingness to “dip a cup” or fish in the vicinity of the mine and factors influencing that willingness, Inuit values associated with water and water laws and norms, among many other considerations, would add immensely to the quality of the Project water management and monitoring system. As it stands, the limited means and scope by which BIMC has collected IQ and Inuit land and marine use data, especially water use, over the better part of the past decade means that there is limited data available to support the assessment of effects on Inuit use and values for Water. QIA is committed to working with Baffinland to identify additional data collection, monitoring and management mechanisms that more readily integrate Inuit perspectives and IQ into Project water management systems. Further commitments are required to address gaps in IQ data collection, analysis, and incorporation into Project planning, monitoring and management systems, including but by no means limited to the identification of waterbodies of heightened importance. To resolve these concerns, QIA requests the following: 27.1 The Proponent is requested to commit to expedite work with affected communities to develop and implement baseline data collection including on the ground studies for Inuit Water Values, Water Use, and identification of Waterbodies of heightened importance. 27.2 The Proponent is requested to provide further detail on: a. How IQ related to water use and water values was recorded from Inuit community members during any IQ data collection for the Project.

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	b. How IQ related to water use and water values will be integrated into the Project management systems prior to conclusion of the Water Licensing process. c. How IQ related to water use and water values will be integrated into the Project management systems if the Phase 2 amendment is approved.
Status (October 25, 2021)	*This Technical Comment was originally submitted on October 25, 2019. QIA has not received a response from Baffinland at this time. Regardless, this Technical Comment has been updated to reflect new information shared with QIA through various regulatory processes.* 27.1 & 27.2: Unresolved. Relevant activities related to this topic that have occurred in the interim include: • QIA has completed an additional Tusaqtavut IQ study with the communities of Arctic Bay and Clyde River, and filed this work on the public record with NIRB in the summer of 2021. This work was funded by Baffinland. • QIA is working with the community of Pond Inlet to complete a study on IQ on and use of freshwater resources in the area impacted by the Mary River Project. This work has been funded by Baffinland. QIA will be available to provide an update on the status of this work and its implications for the water licensing process at the technical meeting on November 12, 2021. Baffinland provides information in its updated Water Licence filings for each proposed water withdrawal location. However, it is not clear what IQ and Inuit perspectives has informed this work. It is important to determine whether any of the proposed water withdrawal sources and amounts are an issue from an Inuit water use and values perspective. For example, at pg. 22 of 25 of Part 1 of the Water Withdrawal Plan, Baffinland notes "Regarding the extraction of water from lakes during the open water season, the FEIS identified the reduction in lake outflow of 10% as a commonly applied threshold value (FEIS Volume 7, Page 19; Baffinland, 2012)." It is not clear that IQ would agree with this threshold. It also remains unclear what role IQ played in the characterization of fish habitat. That makes statements like the following from the Executive Summary (pg. 18 of 30) difficult to verify: "The railway has been routed to minimize impacts on fish and fish habitat". And while Section 2.7 of the Main Report identifies 30 required quarries and the amounts of material proposed to be removed from them, it is not clear whether these quarries are located in areas of high value and use to Inuit or whether Inuit have verified the acceptability of these quarry locations.
Supplemental Requests (October 25, 2021)	27.3.a. Baffinland is requested to update whether it has identified any waterbodies of heightened importance to Inuit in the Regional Study Area for the Mary River Project, and if so:

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	i. provide details about those waterbodies and why they are considered of heightened importance to Inuit, and ii. identify what additional monitoring and mitigation measures Baffinland commits to put in place around waterbodies of heighted importance. Data sources that are available to Baffinland include its engagement with Inuit parties, the results of the Tusaqtavut studies with all five impacted communities, through oral submissions at the technical meetings and hearings for the Mary River Phase 2 Project, and submissions on the public record by Inuit parties. 27.4 Baffinland to identify whether and how IQ and Inuit perspectives were integrated into the siting of quarries, laydown areas, water withdrawal points and amounts, and water crossings associated with the Phase 2 construction and operations, including provision of evidence that Inuit were asked about their concerns and values related to each location currently proposed for each of the above infrastructure-related physical works and activities noted in this Technical Comment. a. In relation to water withdrawals as identified in Baffinland's updated filings, including dust suppression water sources, Baffinland is requested to identify what role Inuit and IQ played in site characterization, what have Inuit said about where it is appropriate to withdraw water from and how much, where, when and under what conditions it is acceptable to do so, and how this has been included in the updated filings. 27.5 Baffinland to identify any evidence it has of Inuit verification of fish bearing vs. non fish-bearing waterbodies, and marginal vs. important habitat, as presented by Baffinland in its updated Water Licence filings. a. Baffinland to identify what role IQ and Inuit played in the North Railway Freshwater Habitat Survey: 2018.

Technical Comment	**28. Inadequate Assessment of Impacts to Inuit Water Rights**
References	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board. No Date. "Draft Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3)". [Available on request from NWB] • Nunavut Water Board. No Date. "Draft Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, trainings, flood control, diversions, and flow alterations) (M1)". [Available on request from NWB] • 190502 2AM-MRY1325 Amend2 Applic-Att-3.2-SIG-Concord-ILAE • Section 20 in the *Nunavut Land Claims Agreement Act [S.C. 1993, c. 29]*. Available at: https://nlca.tunngavik.com/?page_id=2046&lang=en • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • FEIS Addendum TSD 13 Surface Water Assessment • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP

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	• NIRB Document Qikiqtani Inuit Association's Tusaqtavut Study Specific to the Baffinland Mary River Project Phase 2 for the Communities of Igloolik and Hall Beach, dated September 26, 2019 (available at NIRB Website) • NIRB Document Tusaqtavut for Phase 2 Application of the Mary River Project (for the Community of Pond Inlet), dated June 11, 2019 (Available at NIRB Website) • NIRB Document 210621-08MN053 QIA Tusaqtavut Study (for Artic Bay and Clyde River) – Parts 1 through 6 (Accessible at NIRB Website) • 210917-2AM-MRY1325-Amend2-Applic-Att-3.2-SIG-Concord-IAAE
Issue/Concern	Question 19 in the Water Licence Amendment Application asks, "Does the proposed amendment substantially affect the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL)?" (Page 13 of 17). In addition, both Section 40 of the Draft Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3) and Section 39 of the Draft Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, trainings, flood control, diversions, and flow alterations) (M1) require the Proponent to: "Provide a description of any potential effects of the project on the quality, quantity, or flow of waters flowing through Inuit Owned Land (IOL)." In relation to this, in describing effects to Inuit Water Rights Section 20.3.3 of the *Nunavut Agreement* requires consideration of the following: *"(a)the adverse effects of the change in quality, quantity or flow of water on Inuit Owned Lands, owned or used by the person or group affected;* *(b) the nuisance, inconvenience, disturbance or noise caused by the change in quality, quantity or flow of water to the person or group affected;* *(c)the adverse effects of the change in quality, quantity or flow of water in combination with existing water uses;* *(d)the cumulative effect of the change in quality, quantity or flow of water in combination with existing water uses;* *(e)the cultural attachment of Inuit to Inuit Owned Lands, including water, adversely affected by the change in quality, quantity or flow of water;* *(f)the peculiar and special value of Inuit Owned Lands, including water, affected by the change in quality, quantity or flow of water; and* *(g)interference with Inuit rights, whether derived from this Article or some other source."* The Proponent's SIG Concordance Table notes that TSD 13 of the updated FEIS provides this information as well as measures to address those effects. TSD 13 does not include Inuit identified indicators or thresholds for use, water quality, quantity or flow, including any experiential indicators identified by Inuit as important to

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	their experience of, measuring the quality and quantity of, and willingness to use, water and waterbodies. TSD 13 does state that a, "very small proportion of stakeholder concerns recorded during engagement on the Phase 2 Proposal were related to surface water" (Page 15 of 173); however, TSD 13 does not explain what engagement was undertaken to discover Inuit water concerns or characterize effects in relation to water (see also QIA TC #26 above). The Aquatic Effects Monitoring Plan also lacks Inuit/IQ based indicators and definitions of water quantity, quality, and flow (for example see Section 2.2 Water Quantity in the AEMP which lists key indicator and benchmarks, Page 31 of 148). QIA is requesting Baffinland identify additional data collection, monitoring and management mechanisms that more readily integrate Inuit perspectives and IQ into Mary River Project water management systems. We will report to the NWB on progress in this regard during the Water Licence process. To resolve these concerns, QIA requests the following: 28.1 The Proponent, in consultation with QIA and the affected Inuit communities, to work with Inuit and provide funding to develop additions to the current water management and monitoring system that include Inuit-identified indicators or thresholds for use, water quality, quantity or flow, including any experiential indicators identified by Inuit as important. 28.2 The Proponent, in consultation with QIA and the affected Inuit communities, to identify ways in which the ongoing assessment of Project Effects on Inuit Water Use and water quality, quantity, and flow in Inuit Owned Lands can be conducted through an Inuit/IQ enriched lens.
Status (October 25, 2021)	*This Technical Comment was originally submitted on October 25, 2019. QIA has not received a response from Baffinland at this time. Regardless, this Technical Comment has been updated to reflect new information shared with QIA through various regulatory processes.* 28.1 & 28.2: Unresolved. Relevant activities related to this topic that have occurred in the interim include: • The completion of a Tusaqtavut study with two additional communities, Clyde River and Arctic Bay, with identification of additional values related to and impacts on freshwater and fishing from the perspectives of these two communities. • Data collection and identification of initial impact pathways on freshwater and fishing by QIA for the ongoing Culture, Resources and Land Use (CRLU) Assessment, using data from the five communities' Tusaqtavut reports, Baffinland's FEIS Addendum, NIRB transcripts, and Inuit parties' submissions on

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	the public record. Notwithstanding that it is primarily the developer's responsibility to do this work, QIA will be prepared to provide an update to the NWB on impact pathways associated with freshwater and fishing at the forthcoming technical meeting. • QIA worked with Pond Inlet community members in an ongoing IQ Water Values Study. This work, funded by Baffinland, will be an important contribution to TC 28.1 above. QIA will be prepared to provide an update on the implications of and timing for completion of this work at the forthcoming technical meeting. QIA notes that while Tusaqtavut studies for each of the five impacted communities have been filed, there is no reference to them in the SIG Concordance Table (e.g., in relation to sections 33, 40 or 41 of the SIGs at pg. 7 of 24, which still refer only to 2018 TSD filings by Baffinland). At pg. 13 of 24, Baffinland refers to even older data, the original 2012 FEIS, to provide the NWB with information on "traditional uses of water in the project area". Obviously, Inuit use of waters is neither static nor is it something where a comprehensive record was available based on work done prior to 2012. It is critical to update based on input from more community members and changes over time, what we know about "traditional uses of water in the project area". Despite this, QIA has found little evidence that the findings of any of the Tusaqtavut studies, some of which were filed as early as 2019, have been reviewed, incorporated, or even mentioned in the Baffinland updated Water Licence materials. The only exception to this is the very brief mention given to Tusaqtavut in some of the draft monitoring and management plans. Given that the findings of the Tusaqtavut studies are clearly material to determination of impact pathways on water, Culture, Resources and Land Use, and Inuit rights, it is concerning that the Water Licence filings make no reference to them.
Supplemental Requests (October 25, 2021)	28.3 Baffinland to provide a supplemental filing prior to the technical meeting, identifying all existing and potential Phase 2 impact pathways from the Mary River Project on Inuit water values and associated Inuit rights, and what Baffinland mitigation and monitoring commitments should be applied to those impact pathways. All of the data sources on the NIRB process public record, including those referred to above, should be considered by Baffinland in developing this list of impact pathways. a. In addition, Baffinland should provide any evidence it has of Inuit verification of Baffinland's findings regarding likely Phase 2 impacts on water.

Technical Comment	**29. IQ and Snow Management**
References	• 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • 190513-08MN053-BIMC Draft Mgmt Plans-Snow Mgmt Plan

Issue/Concern	The Application Main Report identifies the Snow Management Plan as an important document relevant to the amendment application as it, "identifies measures to mitigate the release of sediment to watercourses from meltwater originating from snow piles" (Page 63 of 69). The SWAEMP also identifies this plan as important because, "extreme flows occurring during freshet can result in significant erosion and damage to water crossing structures. Operational protocols and plans, including the Snow Management Plan (BAF-PH1-830-P16-0023) … have been developed to manage freshet's high flows and mitigate freshet's potential negative impacts on surface water quality and associated infrastructure." (Page 21 of 66). The Proponent's response to QIA TC #4.1 indicates that the Snow Management Plan will be updated, "based on IQ collected through a series of Community Risk Assessment Workshops (January - May 2019) as well as a Crossing Selection Workshop (July 2019)." Snow management and the spring freshet are a known concern of Inuit communities. It is unclear in the updated May 2019 draft of the Snow Management Plan how IQ was considered and integrated. QIA is committed to working with Baffinland and the affected Inuit communities to identify additional data collection, monitoring and management mechanisms that more readily integrate Inuit perspectives and IQ into Project water management systems. We will report to the NWB on progress in this regard during the Water Licence process. To resolve these concerns, QIA requests the following: 29.1 Describe what IQ was collected during these workshops related to Snow Management and how it informed and or changed the Snow Management Plan. 29.2 Describe any future opportunities for IQ to inform revisions to the Snow Management Plan, and how consultation with QIA and the affected Inuit communities has informed these revisions.
Status (October 25, 2021)	*This Technical Comment was originally submitted on October 25, 2019. QIA has not received a response from Baffinland at this time. Regardless, this Technical Comment has been updated to reflect new information shared with QIA through various regulatory processes.* 29.1 & 29.2: Unresolved.
Supplemental Requests (October 25, 2021)	n/a

Technical Comment	**30. IQ and Monitoring**
References	• 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP • 190502 2AM-MRY1325 Amend2 Applic-Att-28-EPP

	• 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • 210917-2AM-MRY1325-Amend2-Applic-Att-2.2-Main-Rpt-IAAE
Issue/Concern	The Application main report and associated supporting documents including updates to the Environmental Protection Program and Aquatic Effects Monitoring Plan do not appear to have been heavily informed by IQ nor do they include dedicated or detailed community environmental monitoring activities or programs. Gaps include but are not limited to: • The proposed fresh water sampling design and locations do not appear to have been informed by IQ. The Main report notes that the QA/QC Plan remains unchanged (see Main Report Page 50 of 69). • Inuit were not involved nor have Inuit values been included as a factor in selecting Water Crossing Monitoring sites, as noted in the SWAEMP factors for selecting sites do not include IQ or value-based factors for Inuit (Page 47 and 48 of 66). • The SWAEMP does not include Inuit Community involvement in Fish Protection and Fish habitat monitoring (See section 6.3.3 in the SWAEMP). • The AEMP does not reference IQ or Inuit involvement in the response framework in section5.2. While the Proponent indicated in their Response to QIA 4.2 that, “Baffinland is willing to consider modifications to its Tote Road Monitoring Program to monitor water quality at Inuit water use areas, if the appropriate IQ information can be made available” (Page 13 of 19) this statement does not indicate that Inuit will actually be involved in this monitoring. QIA expects Baffinland to identify additional data collection, monitoring and management mechanisms that more readily integrate Inuit perspectives and IQ into Project water management systems. We will report to the NWB on progress in this regard during the Water Licence process. To resolve these concerns, QIA requests the following: 1. Describe how IQ has informed aquatic monitoring programs and recent revisions to relevant monitoring and management plans. 2. Commit to working with QIA and the affected Inuit communities to identify opportunities for Water-specific IQ studies and monitoring programs including how Inuit monitors and Inuit observational criteria will be used in Project-related monitoring activities. 3. Provide further information on what role the Proponent is committed to having Inuit play in developing priority SNP site locations and related monitoring activities. 4. Provide further information on how data collected by Inuit and through water monitoring overall will be integrated into the Proponent’s committed to Culture, Resources, and Land Use (CRLU) Monitoring Program for the Project, and what role is envisioned for the Proponent’s committed to Inuit Committee for the Project, in relation to water planning, effects assessment, monitoring and adaptive management.

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Status (October 25, 2021)	*This Technical Comment was originally submitted on October 25, 2019. QIA has not received a response from Baffinland at this time. Regardless, this Technical Comment has been updated to reflect new information shared with QIA through various regulatory processes.* 30.1, 30.2, 30.3 and 30.4: Unresolved. Relevant activities related to this topic that have occurred in the interim include: • QIA worked with Pond Inlet community members in an ongoing IQ Water Values Study. This work, funded by Baffinland, will be an important contribution to TC 30.2 above. QIA will be prepared to provide an update on the implications of and timing for completion of this work at the forthcoming technical meeting. QIA notes that Section 6.0 through 6.3 of the Main Report ("General and Aquatic Effects Monitoring – Part 1") does not refer at all to the Inuit Stewardship Plan, Inuit-led water quality monitoring, or the Inuit-led Culture, Resources and Land Use Monitoring Program. This seems like a major gap in the description of the committed-to monitoring program, given the almost total absence of Inuit-led monitoring under the current Mary River Project monitoring system.
Supplemental Requests (October 25, 2021)	30.5 Baffinland to identify whether it is formally committed to support the development of an Inuit-led water quality monitoring program in relation to the Mary River Project. a. If so, Baffinland is asked to provide more information on how it envisions the Inuit-led water quality monitoring program will work alongside Baffinland's current water quality monitoring program, what level of financial commitment Baffinland has on an annual basis for this program, and what discussions Baffinland has initiated with Inuit about development and implementation of this Inuit-led water quality monitoring program.

Technical Comment	31. Baffinland's Magnitude of Commitment to Inuit-Led and IQ-based Monitoring
References	• NIRB document 210203-08MN053-QIA Inuit Certainty Agreement-IA1E (available on NIRB website)
Issue/Concern	Baffinland's Water Licence Application materials and the public record for the NIRB Phase 2 process describe monitoring programs and plans that are in place and planned should Phase 2 proceed. While it is clear from the public record that that vast majority of monitoring is of a technical nature rather than IQ-based monitoring, the proportion (currently and committed to should Phase 2 proceed) of monitoring activities and related costs between these two types of monitoring is not quantified. Baffinland has now committed on the public record for the NIRB Phase 2 process to support for an Inuit-led Culture, Resources and Land Use Monitoring Program for the Mary River Project, under an Inuit-led Inuit Stewardship Plan.

	It is important to establish the degree to which Baffinland is committed to financing Inuit-led monitoring. To date no information has emerged about the quantum of support Baffinland is willing to put toward these programs, in comparison with technical scientific monitoring programs. To resolve these concerns, QIA requests the following: 31.1 Baffinland to provide for its existing monitoring programs in place, either the average annual costs of its overall monitoring program and the proportion of that which goes to Inuit-led, IQ-driven monitoring, at present; or, if Baffinland deems this financial data to be proprietary; the proportion of average annual monitoring expenditures that go to technical, scientific monitoring works and activities, and Inuit-led, IQ-driven monitoring works and activities, respectively, at present. 31.2 Baffinland to provide its expectations for what proportion of its monitoring expenditures will be for technical, scientific monitoring works and activities, and Inuit-led, IQ-driven monitoring works and activities, respectively, should Phase 2 proceed, given new committed-to programs.

Technical Comment	**32. Alternative Means Assessment (re: North Railway Route #3)**
References	• 210917-2AM-MRY1325-Amend2-Applic-Att-3.2-SIG-Concord-IAAE
Issue/Concern	In the Supplemental Information Guideline Concordance Table (pg. 4 of 24), Baffinland refers the reader to its 2018 TSD 01, Alternatives Analysis, for more information on alternative means considered and preferred by the Proponent for physical works and activities associated with the proposed Phase 2. However, given that the currently proposed Route 3 was not the preferred option identified in TSD 01, QIA fails to see how TSD-01 is an adequate information base on which to consider the relative merits of Route 3 versus other alternatives, nor is it clear what Inuit perspectives on Route 3 are currently proposed. To resolve these concerns, QIA requests the following: 32.1 Baffinland provide an update or supplemental filing to TSD-01 that provides its current comparison of all technically and economically feasible alternative means to transport ore to Milne Port, including alternative rail routes, which should be altered from the 2018 TSD given that additional information has come forward in the interim; and 32.2 Baffinland provide an update on the position of Inuit parties in relation to Route 3 to the NWB, and results of all engagement meetings on this topic to date.

Technical Comment	**33. Interim Closure and Reclamation Plan**

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References	• 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt1of3-IAAE • 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt3of3-IAAE
Issue/Concern	The Interim Closure and Reclamation Plan is subject to joint approvals between Baffinland and QIA. Baffinland provides a three-part updated Interim Closure and Reclamation Plan as part of its Water Licence filings. It is unclear whether prior inputs from QIA from September 2019 have been integrated into this revision. In addition, it is unclear whether Inuit parties have played any role in the determination of Residual Effects in Appendix G, starting at pg. 60 of 191 in Part 3 of the Interim Closure and Reclamation Plan. To resolve these concerns, QIA requests the following: 33.1 Baffinland to provide a supplemental filing indicating where it has integrated prior input from QIA and any other Inuit party into revisions to the Interim Closure and Reclamation Plan. 33.2 Baffinland to identify whether Inuit parties and IQ have played any role in the development of the residual effects characterization methodology used in Appendix G, and/or have verified the findings in Appendix G. 33.3 Baffinland to identify any plans it has to engage Inuit parties moving forward in the steps outlined in #2 above.

Main Application

TC Number:	**34. Fish Habitat Compensation**
Reference:	• Mary River Project Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325 • Section 2.5.3 North Railway Stream Diversion page 26 of 66
Issue/Concern:	Baffinland states, "The effects of diverting streams in terms of hydrology, fish passage, and impacts to fish habitat of the remaining diversions will be forthcoming in hydrological modelling and fish habitat quantification reports that Baffinland intends to issue to DFO with a future application for a Fisheries Act Authorization. Baffinland will be implementing mitigation measures on a crossing-by-crossing basis to reduce flow velocities. Potential velocity reduction measures include additional culvert barrels, channel widening, construction of habitat features, regrading, and channel stabilization." To resolve these concerns, QIA requests the following: 33.1 QIA requests involvement in developing habitat features and selecting appropriate habitat compensation both in kind and otherwise as necessary.

Surface Water, Aquatic Ecosystem Management Plan

TC Number:	35. Discharge Volumes a Performance Indicator
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 2.1 Objectives • Table 2.1 Objectives and Performance Indicators page 11 of 109
Issue/Concern:	Water quantity (discharge) is not included as a performance indicator. Water quantity is a valued ecosystem component (VEC), is protected by Article 20 of the Nunavut Land Claims Agreement and is an integral determinant of water quality (such as determining loadings of parameters of concern). To resolve these concerns, QIA requests the following: 35.1 It is recommended that Baffinland include discharge in the list of performance indicators for the mitigation of potential impacts to water, the protection of aquatic ecosystems and maintaining receiving environment water quality.

TC Number:	36. Soil Spoils Storage Capacity
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G

	• Section 2.4.4 Preventative Design Measures for Ground Disturbances. • Table 2.4 Comparison of Soil Spoils Volumes with Available Capacities at Borrow Pits and Quarries Page 19 of 109
Issue/Concern:	According to Table 2.4, 333,729 m3 of additional storage is required for estimated spoils generated. To resolve these concerns, QIA requests the following: 36.1 Indicate where additional storage will be provided and the volume of extra storage available in the event that estimates of spoils generated are greater than anticipated or volume of available storage is underestimated. 36.2 Clarify if spoils will be stored in such a way as to permit access to promote revegetation at closure.

TC Number:	37. Responsibility of Monitoring Program Development and Implementation
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 3.3.2 Working Near Waters page 30 of 109 and • Section 3.3.4 Quarries page 44 of 109 • Section 5.1 Monitoring During Construction page
Issue/Concern:	In Section 3.3.2 Baffinland states, “Contractors will be required to include appropriate sedimentation and dust control measures prior to the start of work. These mitigation measure will be reviewed and approved by Baffinland and the IEM. Monitoring stations may also be established to ensure mitigation measures are effective.” In section 5.1 Baffinland states, “Construction activities not monitored under activity specific monitoring programs (such as water crossing installations and modifications, rail stream diversions, and quarry and borrow source monitoring) will be subject to general construction monitoring that will be developed by contractors during the tendering process.” In section 3.3.4 Baffinland states, “Quarrying is a ground disturbance activity that has the potential to adversely affect local aquatic ecosystems through erosion and sedimentation and water quality impacts if blasting residues are present in runoff above guidelines.” While we appreciate that Baffinland wishes contractors to take responsibility for monitoring their activities, the ultimate responsibility to develop and implement a monitoring program falls to Baffinland as part of the licence application; all components of the aquatic environment monitoring program and Surveillance Network Program (SNP) must be presented for each stage of the project. This includes background data for each component of the project for comparison purposes as well as the selection of parameters that are indicative of potential contaminants of concern, including but not limited to: TSS,

	sedimentation, oil and grease, pH and nitrogen parameters associating with blasting activities. To resolve these concerns, QIA requests the following: 37.1 Baffinland develop and implement a monitoring program for all stages of the project including background, construction and operational monitoring and provide a parameter list that is indicative of all potential parameters of concern.

TC Number:	38. Maintaining a 100 m Naturally Vegetated Buffer
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 3.3.3.2 Fish Protection page 32 of 109
Issue/Concern:	Baffinland states, "In developing Project quarries, a minimum 100 m naturally-vegetated buffer between the high-water mark of any fish-bearing water bodies and any permanent quarries with potential for acid rock drainage or metal leaching will be maintained." To resolve these concerns, QIA requests the following: 38.1 Baffinland clarify the criteria they will use to determine if quarries have the "potential" for acid rock drainage or metal leaching. 38.2 Baffinland should also describe what measures will be used to prevent and manage ARD/ML at source so that the integrity of vegetation in the 100m buffer is not damaged.

TC Number:	39. Monitoring Programs
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.0 Monitoring • Table 5.1 Monitoring Programs page 56 of 109
Issue/Concern:	In Table 5.1 monitoring programs related to the SWAEMP are listed with the Project phase with which they are applied. The baseline phase is missing from the table. Baseline monitoring is required to determine if Project activities during the construction, post-construction and operations phases have altered the aquatic environment and the degree of change. These data are used as part of adaptive management plans and are also used for regulatory purposes. To resolve these concerns, QIA requests the following:

	39.1 It is recommended that the table and monitoring programs be updated to include: A defined period of record that will be used as baseline data to compare with for monitoring programs for Phase 2. 39.2 Dates or timelines to determine when each phase is expected to take place to understand how much data will be collected for each phase of the mine. A definition of the "post-construction verification phase" and how it differentiates from the operations phase and; 39.3 Collection of data for the SNP, NCMP, snow management monitoring, groundwater monitoring, Type B Water Licence Monitoring and AEMP during all four phases of the mine (baseline, construction, post-construction verification and operation)

TC Number:	40. Surface Water and Aquatic Ecosystems Trigger Action Response Plan
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.0 Monitoring • Table 5.2 Surface Water and Aquatic Ecosystems Trigger Action Response Plan pages 57 through 60 of 109
Issue/Concern:	The broad objective of adaptive management is to provide certainty in how the proponent will respond to changing environmental conditions to prevent significant adverse effects, reduce noncompliance and minimize environmental impacts. Discharge criteria are set at a level to avoid both acute and chronic deleterious effects to the receiving environment. Associating action levels with noncompliance may incur an unnecessary risk to the aquatic environment. The action levels associated with moderate risk for construction, water crossing installations and/or modifications, road operation site operations including stockpiling snow, quarry and borrow pit operation, and landfill operation (Table 2) are set at concentrations of performance indicators which exceed or are above the discharge limits outlined in the water licence. To ensure the adaptive management framework avoids unnecessary risk to the aquatic environment we suggest Baffinland incorporate more conservative thresholds for their low, moderate and high-risk thresholds to ensure that management is triggered prior to any non-compliance. For the project activity road operation and the objectives of mitigating potential impacts to water quality and aquatic ecosystems the only parameter considered as part of the Trigger Action Response Plan is TSS. Parameters other than TSS should be included in the response-action framework such as iron and chloride. We recognize that calcium chloride is an approved dust suppressant in Nunavut, however chloride is a conservative ion that does not break down. There are concerns that there will be a build up of chloride which can cause a depression of the permafrost. Therefore, iron and chloride should be added to the response-action framework for road operation activities.

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	For the project activity road operation and the objectives of safeguarding fish habitat and fish passage the risk thresholds only take fish presence into consideration. Changes in fish health such as those related to fish length, fork length, lesions and injuries could indicate issues associated with mining activities. To ensure that the VECs of fish and fish habitat are maintained these health measures should be incorporated into the Trigger Action Response Plan. For project activities associated with quarry and borrow pit operations the current thresholds solely revolve around TSS concentrations. Parameters such as total ammonia nitrogen, nitrate and total nitrogen are a concern to the aquatic environment due to explosive residuals. These parameters should be adopted into the Trigger Action Response Plan. To resolve these concerns, QIA requests the following: 40.1 Propose more conservative thresholds for their low, moderate and high-risk thresholds. Add fish health measures including fish length, fork length, lesions and injuries into their response-action framework for road operation activities. Add iron and chloride to the response-action framework for road operation activities and add total ammonia nitrogen, nitrate and total nitrogen to the response-action framework for quarry and borrow pit operations activities.

TC Number:	41. Routine Inspections
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.2 Routine Inspections • Table 5.3 Routine Inspections and Monitoring Requirements page 61 of 109
Issue/Concern:	In Table 5.3 the list of items included in the routine inspections does not include flow meter readings, land disturbance and spill kits. No explanation for their absence was provided. To resolve these concerns, QIA requests the following: 41.1 QIA requests the aforementioned items be included in the inspection routine or an explanation be provided for their absence.

TC Number:	42. Establishing When Berms and Drainage Control Measures are Needed
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.4 Monitoring at Project Quarries and Borrow Sources page 64 of 109

Issue/Concern:	Baffinland states, "As required, Baffinland will incorporate best management practices including sediment and erosion control measures installed as per Section 3 of this Plan. Berms and other drainage control measures shall be established where necessary to minimize or prevent surface runoff from nearby water bodies entering active quarries and borrow sources." The adaptive management plan is to prevent unnecessary damage to the aquatic ecosystem. In order to maintain this goal Baffinland must be proactive in its management of on-site features. To ensure this is being upheld by Baffinland the reviewer needs to understand how Baffinland determines when a drainage control measure is required. To resolve these concerns, QIA requests the following: 42.1 Provide the criteria Baffinland utilizes to determine when a berm or other drainage control measure is considered necessary.

TC Number:	43. Thresholds for the Northern Corridor Monitoring Program Adaptive Management Framework and Response-Action Framework
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.6 Northern Corridor Monitoring Program • Figure 5.1 Northern Corridor Monitoring Program Adaptive Management Framework page 66 of 109 • Appendix H Northern Corridor Monitoring Program • Section 5. TSS Water Quality Criteria and Response-Action Framework page 48 of 52 • Figure H.4 TSS Response-Action Framework page 49 of 52
Issue/Concern:	In Section 5.6 and Figure 5.1 Baffinland states the threshold for the Environmental Coordinator is, "TSS concentration downstream of the water crossing compared to upstream: 1. Exceed 50 mg/L when upstream concentrations are <250 mg/L. 2. Exceed 20% when upstream concentrations are >250 mg/L." These threshold values are reiterated in Appendix H, Section 5, Figure H.4. The monitoring sites along the Northern Corridor are outside the project footprint and water management infrastructure but are within the immediate receiving environment therefore; these stations should be part of the AEMP and are therefore subject to CCME guidelines. CCME guidelines for TSS include a maximum increase of 25 mg/L from background levels for any short-term (24-h period) exposure and an average increase of 5 mg/L from background levels for longer term exposures (inputs lasting between 24 h and 30 d) during clear flow. During high flow periods a maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L but should not increase more than 10% of background levels when background is equal to or greater than 250 mg/L.

	The broad objective of adaptive management is to provide certainty in how the proponent will respond to changing environmental conditions to prevent noncompliance and minimize environmental impacts. Thresholds should be set at a level to avoid both acute and chronic deleterious effects to the receiving environment. Associating action levels with non-compliance incurs an unnecessary risk to the aquatic environment. To resolve these concerns, QIA requests the following: 43.1 Baffinland propose a more conservative threshold for action with regard to the Northern Corridor Monitoring Program.

TC Number:	44. Fish Health Adaptive Management
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.7 Fish Passage Monitoring page 67 of 109
Issue/Concern:	In Section 5.7 Baffinland states, “Basic metrics on fish health (fish presence, catch per unit effort, fish length and fork length) are collected from the crossing sites monitored along the Tote Road. Baffinland has agreed to a QIA request (Technical Review Comment QIA-42) during the review of the Phase 2 Proposal to add observations regarding physical condition (e.g., lesions, injuries) to such monitoring programs. The same data will be collected at railway crossings, unless otherwise directed by DFO in the FAA. While this health-related data will be provided, Baffinland notes that determining causation may be difficult. As such, thresholds have not been established for this component of the aquatic monitoring program. While we agree that determining causation can be difficult, the identification of increased lesions or injuries to fish near mining infrastructure such as the northern rail or Tote Road would indicate a potential mining related (i.e. fish passage) issue. As part of the adaptive management plan an investigation into the potential cause of increased or more severe lesions or injuries could be part of Baffinland’s response plan. Furthermore, background data on fish presence, catch per unit effort, fish length, fork length, lesions and injuries should be collected prior to the start of construction at all new potential road crossings to obtain baseline data that can be used as input into the adaptive management plan. To resolve these concerns, QIA requests the following: 44.1 Baffinland include fish health data including fish presence, catch per unit effort, fish length, fork length, lesions and injuries in their adaptive management plan.

TC Number:	45. Fish Passage Monitoring

Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.7 Fish Passage Monitoring page 69 of 109
Issue/Concern:	Baffinland states, "The nine low-risk stream diversions will be visually monitored monthly during the first complete open water season (and the preceding partial open water season, if applicable) to identify evidence of: • Flooding if the capacity of the channel is being exceeded • Subsidence or slope instability • Channel bed scour or bank erosion • Deposition of previously eroded materials" and "The medium risk stream diversion at CV-47-1b will be subject to a pre-construction site assessment and possible design mitigation to address any concerns that may be identified regarding potential flooding, subsidence, channel bed scour or bank erosion. The assessment is likely to include: the establishment of transects, survey (level and rod), and take. Post-construction monitoring of this site will be conducted as described above for the low-risk stream diversions, with implementation of the sediment and erosion monitoring program and associated response framework implemented as described in Section 3 of Appendix F. Some parameters, such as TSS, have accurate action levels that will trigger the action response framework (Appendix F and H). Others, such as flooding and/or changes to stream morphology, are subjective and will require an exercise of professional judgement regarding action response, as there are no definitive action level triggers." A year and a half of open water season monitoring is not sufficient to identify flooding capacity of the channel due to differences in annual precipitation. To resolve these concerns, QIA requests the following: 45.1 Request commitment to annual inspections for life of mine.

TC Number:	46. Construction SNP Stations at Milne Port and Mine Sites
Reference:	• Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Appendix C Site Drainage and Monitoring Figures 6.1 and 6.2 pages 108 and 109 of 109 • Appendix G Surveillance Network Program Schedule • Schedule G.1 – Construction Phase SNP Stations – Milne Port page 23 of 52
Issue/Concern:	The sampling frequency for construction Phase SNP Stations at the Milne Port and Mine sites is, "monthly sampling during periods of flow and following significant precipitation events." Please indicate what is considered a "significant" precipitation event. Sampling locations, MS-CC and MS-C-D are not designated as verification SNP stations or regulated surveillance network program stations in Figure 6.2 Appendix C. Stations MQ-C-A through MQ-C-E are not on the Mine Site layout map in Figure 6.2 of Appendix C.

	To resolve these concerns, QIA requests the following: 47.1 Clarify what is considered a significant precipitation event and update maps to ensure all sites are included and have been labelled for evaluation of the SNP monitoring program.

TC Number:	47. Water Crossing Repairs and/or Installations Monitoring Frequency
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Appendix F Environmental Guidelines for Project Water Crossing Repairs and/or Installations • Section 4. Water Sampling and Monitoring Frequency • Table C-1 – Summary of Water Quality Monitoring Frequency page 9 of 52

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Issue/Concern:	Table C-1 outlines that one single pre-construction water sample and field monitoring event will take place with one sampling event in June, July and August. Sampling frequency is reiterated by Baffinland for pre-construction monitoring, "Concurrent water sampling and field monitoring will be conducted at least once at locations 100 metres downstream and 50 metres upstream of the water crossing to be repaired, modified and/or installed. During the same monitoring event, field monitoring will also be conducted at a location 50 metres downstream of the affected water crossing." And post-construction, "Post-construction water quality monitoring, at a minimum, will consist of three (3) concurrent water sampling and field monitoring events conducted during the open water season following the completion of construction at a water crossing. Water quality will be monitored during high flows (June), medium flows (July) and low flows (August) at locations 100 metres downstream and 50 metres upstream of the water crossing. Water sampling and field monitoring events will occur at least 10 days apart. For example, a water crossing repaired, modified and/or installed during frozen conditions would be monitored at least once during June, July and August of the following open water season. In contrast, a water crossing repaired, modified and/or installed during July, would be monitored at least once during the following month (August) and once again during June and July of the following year. This approach will ensure that a modified water crossing's performance is assessed and determined to be adequate for varying flow conditions, representative of flow conditions during a typical open water season." There is no guarantee that the one-year the monitoring takes place is a typical open water season. It is important that crossings stand up to various flow conditions including extreme precipitation events as atypical weather is more likely with climate change. To resolve these concerns, QIA requests the following: 47.1 Baffinland commit to sampling for three years after water crossing construction or disturbance with monitoring during operations considered acceptable.

TC Number:	48. Water Crossings Water Quality Action Levels
Reference:	• Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Appendix F Environmental Guidelines for Project Water Crossing Repairs and/or Installations • Section 5. Water Quality Action Levels • Table C-1 – Water Quality Action Levels page 11 of 52 • Section 7. Action Response Framework During Construction

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Issue/Concern:	In Section 5, Table C-1 – Water Quality Action Levels for the Pre-Construction Phase the water quality action level for TSS is, "a maximum increase of 50 mg/L from background levels (upstream) when background levels are between 25 and 250 mg/L. A maximum increase of 10% of background levels when background levels are greater than 250 mg/L." The action level during construction is, "A maximum increase of 100 mg/L from background levels (upstream)." The action level for post construction is the same as pre-construction. The construction for water crossings will take place along the Northern Corridor which is outside the project footprint and water management infrastructure but are within the receiving environment therefore, these areas are part of the receiving environment and are therefore subject to CCME guidelines. CCME guidelines for TSS include a maximum increase of 25 mg/L from background levels for any short-term (24-h period) exposure and an average increase of 5 mg/L from background levels for longer term exposures (inputs lasting between 24 h and 30 d) during clear flow. During high flow periods a maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L but should not increase more than 10% of background levels when background is equal to or greater than 250 mg/L. The broad objective of adaptive management is to provide certainty in how Baffinland will respond to changing environmental conditions to prevent noncompliance and minimize environmental impacts. Action Levels should be set to avoid both acute and chronic deleterious effects to the receiving environment. Associating action levels with non-compliance incurs an unnecessary risk to the aquatic environment. In section 7 the during construction action response framework indicates that action will only be taken if TSS and/or turbidity monitoring results exceed the applicable water quality action level 75% of the time. As noted above the action levels proposed by Baffinland represent an exceedance of the generic short-term CCME guideline for TSS. Based on the proposed action response framework Baffinland proposes to permit these exceedances until they have occurred 75% of the monitoring period. These action levels pose a risk to the aquatic environment. To resolve these concerns, QIA requests the following: 48.1 Identify a single exceedance as a trigger to investigate mitigative actions (i.e., sediment control fencing or rip rap placement).

TC Number:	49. Operation Phase SNP Stations
Reference:	Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G Appendix G Surveillance Network Program Schedule Schedule G.3 – Operation Phase SNP Stations – Milne Port page 26 through 30 of 52 Schedule G.4 – Operation Phase SNP Stations – Mine Site pages 31 through 38 of 52

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Issue/Concern:	For station MP-04A and MS-05B, sampling frequency for water discharge volume is monthly. Sampling should be increased to weekly during freshet and monthly during the remainder of the open water season. Iron is a parameter of concern and should be added to the contaminated snow dump parameter list. Baffinland proposes to monitor water discharge volumes from stormwater, settling and sedimentation ponds (MP-05, MP-06, MP=07, MP-08, MP-09) monthly during the summer. Water quantity is a VEC and is crucial in understanding water quality on site and in the receiving environment. Water monitoring of both quantity and quality from ore stockpiles, including stations MS-07 and MS-10, should be monitored weekly to ensure compliance. Stockpiles are increasing in size and will be receiving new deposits therefore compliance under the new configuration needs to be confirmed. To resolve these concerns, QIA requests: 49.1 Weekly monitoring of water discharge volume from the Mine and Milne Port contaminated snow dumps during freshet and monthly during the remainder of the open water season. 49.2 Iron be added to the parameter list for contaminated snow dumps. 49.3 Confirm water being transferred between water control ponds is being measured. 49.4 Increase monitoring of stockpile surface runoff to weekly to confirm compliance.

TC Number:	50. Northern Corridor Monitoring Frequency
Reference:	• Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Appendix H Northern Corridor Monitoring Program • Section 4. Monitoring Frequency page 46 of 52
Issue/Concern:	Baffinland states, "Tables H.4 and H.5 outline the frequency of sampling events for the primary parameters (Groups 1 & 2) and additional parameters (Group 4), respectively. As shown in Tables H.4 and H.5, primary parameters will be monitored weekly during Freshet and monthly during Summer while the additional parameters will only be sampled once per season at HADD fish-bearing water crossings. Water samples will be collected for oil & grease (Group 3) during sampling events in which visible hydrocarbon sheen is observed." While water quality is not considered a VEC, Article 20 of the Nunavut Land Claims Agreement (the Nunavut Agreement) states that Inuit are entitled to unaltered water quality, quantity and flow. Based on this understanding water quality is important in of itself and as such Group 4 parameters (hardness, alkalinity, chloride, ammonia, total phosphorus, nitrate, nitrite, dissolved organic carbon, total organic carbon and total and dissolved metals) should be collected at all sampling locations on a seasonal basis. To resolve this concern, QIA requests:

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	50.1 Group 3 parameters be collected at the same frequency as Group 4 and allow a lab technician who is trained in the detection of oil and grease to determine its presence.

TC Number:	51. Northern Corridor Response-Action Framework Parameters of Concern
Reference:	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.6 Northern Corridor Monitoring Program page 65 of 109 • Appendix H Northern Corridor Monitoring Program • Section 5. TSS Water Quality Criteria and Response-Action Framework page 48 of 52 • Figure H.4 TSS Response-Action Framework page 49 of 52
Issue/Concern:	In Section 5.6 Baffinland states, “In addition to TSS, the NCMP monitors for additional parameters, including metals, nutrients, oil & grease, and routine chemistry, such as dissolved anions (e.g. chloride), turbidity and total dissolved solids (TDS). Details regarding sampling frequency and monitored parameters are presented in Appendix H. The monitoring program will utilize a response-action framework to identify, mitigated and monitor for Project related changes in TSS concentrations, if present.” In Appendix H Baffinland states, “The Northern Corridor Monitoring Program will utilize a response-action framework to identify, mitigate and monitor for Project related changes in TSS concentrations, if present. The response framework is outlined in the Figure H.4.” Parameters other than TSS should be included in the response-action framework such as iron and chloride. We recognize that calcium chloride is an approved dust suppressant in Nunavut, however chloride is a conservative ion that does not break down. There are concerns that there will be a build up of chloride which can exacerbate degradation of the permafrost. To address these concerns, QIA requests: 51.1 Include iron and chloride in addition to TSS in the adaptive management framework and response-action framework for the Northern Corridor Monitoring Program.

North Railway Freshwater Habitat Survey

TC Number:	52. North Rail Crossings Aquatic Habitat Methodology
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Rail Crossings – page 11 of 62
Issue/Concern:	Baffinland states “Rail stream crossings identified in the Phase 2 Proposal were assessed for fish presence and habitat use using protocols specific to the Mary River Project developed in 2007 by NSC and Knight Piésold Ltd. to ensure that crossings are assessed in a standardized

	manner (Baffinland 2012a). The protocol was based upon those described in Fisheries and Oceans Canada (DFO) and British Columbia Ministry of the Environment's ([BCMOE] 1989) and NSC (2006). Some site-specific changes to the field methods for the Milne Inlet rail surveys were also made to better capture conditions in this study area, as noted below." It would be helpful to the reviewer if the methodology used to assess aquatic habitat and further define fish bearing and non-fish bearing waterbodies was summarized in the report or as an appendix. It is difficult for the reviewer to determine where it may differ from DFO/BCMOE protocol and if the methodology used to assess aquatic habitat was sufficient to describe these characteristics and functions. To address these concerns, QIA requests: 52.1 Provide a reference to the specific protocols that were developed.

TC Number:	53. Fish Habitat Assessments 1
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 1.0 Introduction – page 8 of 62
Issue/Concern:	Baffinland states "The information presented in this report describes the methods and results of the field program undertaken in 2018, with the intent of assessing fish and fish habitat at all locations where there were potential interactions with North Rail and Tote Road infrastructure described in the Phase 2 Proposal. Although, as noted above, there have been changes in the specific design of Project-related infrastructure at many of the crossings and some new locations have been added, the fish and fish habitat information acquired during the 2018 field survey still provides a useful description of fish habitat at or near the majority of sites identified in the final design." All sites with the potential to have a crossing need to be properly assessed and not rely on data collected for a crossing upstream or downstream at a different location. To resolve this concern, QIA requests: 53.1 Provide site specific data for each crossing

TC Number:	54. Fish Habitat Assessments 2
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.2 North Rail Bridges – page 12 of 62
Issue/Concern:	Baffinland states "Field methods for assessing bridge crossings identified in the Phase 2 Proposal were similar to those applied for smaller streams, but survey transect length was

	smaller (i.e., area surveyed extended from 60 m downstream to 60 m upstream of the crossing site)." It is not clear why the aquatic habitat assessment for bridge crossings was reduced to 60 m downstream of the crossing compared to 100 m completed for North Rail Crossings (Section 2.1.1.1 (4)) or why it was less than for smaller streams. To address this concern, QIA requests: 54.1 Provide rationale for this change in methodology.

TC Number:	55. Barriers to Fish Movement
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Railway – page 12 of 62
Issue/Concern:	*5) Any identified barriers to fish movement, specifically for juvenile Arctic Char, were described and mapped. Fish movement information and barrier characteristics derived from past mine area and Milne Inlet Tote Road surveys were used to assist with barrier identification along the Rail alignment. For example, a gradient greater than 15°, falls, and channel blockages such as boulders were considered impassable barriers.* QIA requests: 55.1 Provide explanation on how barriers greater than 15° were classified, such as how the gradient measured (i.e. clinometer, visual observation, surveyor, using desktop analysis such as digital elevation model). 55.2 Provide references that indicate that a stream gradient of 15° is difficult or impassable for Arctic Char.

TC Number:	56. Fish Community Sampling
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.3 North Rail Lake/Pond Encroachments/Infilling – page 13 of 62
Issue/Concern:	Baffinland states "Fish presence was first identified using backpack electrofishing along an approximately 100 m-long section of shoreline centred at the encroachment site, targeting all nearshore habitat types." QIA requests:

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	56.1 Was the waterbody classified as non-fish bearing if fish were not captured after completing the 100 m long section using the backpack electrofisher? Were other capture methods utilized?

TC Number:	57. North Rail Stream Diversions
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.4 North Rail Stream Diversions – page 14 of 62
Issue/Concern:	Baffinland states "In addition, an aquatic habitat survey was conducted in an unnamed lake, downstream of the diversion at CV-90-4, which could potentially experience a reduction in inflow (Appendix 2, Map 11). The habitat survey was completed using a Lowrance sidescan echosounder as described in Section 2.1.3." It is our understanding based on attachment 13.2 Fish Baseline Report Part 3 - Appendix 3 – North Rail Diversion Site Maps and Results of 2018 Field Program (page 9 of 135) that downstream of Tote Road (CV-022) fish have been observed. QIA requests: 57.1 What additional studies were completed to address the reduction in flow to the unnamed lake downstream of CV-90-4? 57.2 How will water levels in the unnamed lake be mitigated from the diversion at CV-90-4? 57.3 Have studies been completed to understand the contribution of water from this upper reach to the lake? 57.4 Will the diverted water ultimately flow back into the unnamed lake or a different receiving waterbody?

TC Number:	58. Classification of Arctic Char Habitat
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.2.1 North Rail Crossings – page 19 of 62
Issue/Concern:	Baffinland states "The remaining 48 sites may potentially support char under higher flow conditions; however, some of these sites may never be accessible due to the presence of soft barriers, such as sub-surface flow and high gradients." Further qualification of these 48 sites is warranted to determine if Arctic Char are in fact using these areas during high flow conditions. These potential sites have not been identified as such in Appendix 1. Table A1-1, however it is identified in Attachment 13 – Watercourse Crossings. If there is potential for Arctic Char to use these waterbodies during high flow conditions, it should be confirmed. Depending on the type of in-water works identified for these waterbodies, additional precautions and mitigation measures may be required.

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	QIA requests the following: 58.1 Confirm if fish sampling surveys were completed at these sites.

TC Number:	59. Stream Diversions
Reference:	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.5 North Rail Stream Diversions – page 21 of 62
Issue/Concern:	59.1 Confirm if all engineered drawings have been provided for the stream diversions. 59.2 Confirm if the drawings show the reconstruction channel and tie in to the downstream waterbody.

TC Number:	60. Water Withdrawal Monitoring
Reference:	• Attachment 16 • Detailed Water Withdrawal Plan Part 1 of 4– page 17 of 25
Issue/Concern:	Baffinland states "Streams presented on Figure 3.5 have smaller catchments, and while water can be withdrawn from these streams at the lower pumping rate under any flow condition between approximately mid-June to mid-September without exceeding 10% of the instantaneous flow, the flows will be adequate to extract water at the maximum pumping rate 90% to 95% of the time. " QIA requests the following: 60.1 What monitoring will be completed to ensure there is no impact to fish and fish habitat? 60.2 How will stream flow be measured during the time of any withdrawals to establish what the 10% flow rate is? 60.3 What is the monitoring and mitigation plan if the maximum pumping rate was over estimated for a waterbody?

TC Number:	61. Water Taking in Fish Habitat
Reference:	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 1& 2 of 30
Issue/Concern:	Baffinland states *"Additional mitigation measures outlined in the interim code of practice that will be followed include:* • *Siting intakes with low concentrations of fish throughout the year* • *Placing screens a minimum of 30 cm above the bottom of the watercourse to prevent the entrainment of sediment and benthos*

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	• *Avoid withdrawing water from the littoral zone when possible* • *Avoid withdrawing water, or reducing the rate of water withdrawal, during critical timing windows to diminish the likelihood of entraining eggs and larval fish* *A qualified professional will determine if water withdrawal is allowed at each site during the critical timing window, based on suitability of spawning habitat."* QIA requests: 61.1 Confirm if a monitoring program has been developed to monitor the pump intakes/screen for sediment, debris and impinged fish on a routine schedule (i.e. inspection frequency should be increased during periods when the maximum pumping rate is used)? 61.2 If it is determined that a site is not appropriate for pumping (i.e. sediment uptake, fish impingement) what steps will be taken to identify a new pumping location?

TC Number:	62. Candidate Alternate Location for Summer and Winter Withdrawals
Reference:	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 8 of 30
Issue/Concern:	WS27.1c – Candidate Alternate Location for Summer and Winter Withdrawals This site is also located on KM27 Lake at a location with deep water close to shore (Figures 4.3 and A.7), making it an ideal site for both summer and winter withdrawals. Though the nearshore habitat was not assessed, it is believed to be a suitable location based on deep water close to shore that makes disturbing the substrate unlikely. As per DFO Technical Review comment detailed in Table 1.1 - This assessment should include, but not be limited to, an assessment of the… specific withdrawal locations proposed for each waterbody including fish habitat in the area… QIA requests: 62.1 A detailed fish habitat assessment be completed and submitted for review prior to this location being used for water taking.

Environmental Protection Plan

TC Number:	63. Turbidity Monitoring
Reference:	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.4.3 Environmental Protection Measures – page 40 of 85
Issue/Concern:	Baffinland states "Turbidity monitoring will be conducted at watercourses by Environmental Monitors during and after construction activities when necessary."

	Prolonged exposure to turbidity can be harmful to fish and fish habitat. Excessive turbidity can result in clogging of fish gills and limiting visibility and movement within a watercourse. As described in Section 4.4.3, turbidity monitoring should occur: • during construction activities that involve in-water and near water works, • before, during and after rain events, and • after construction activities are complete and until the site is stabilized. QIA requests: 63.1 Integration of a monitoring threshold for turbidity such as CCME guidelines for the Protection of Aquatic Life. *Turbidity clear flow - Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).* *High flow or turbid waters - Maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Should not increase more than 10% of background levels when background is >80 NTUs.*

TC Number:	64. Fish Barriers 1
Reference:	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures – page 44 of 85
Issue/Concern:	Baffinland states "In culverts on steep slopes, high velocities may result in the movements of rocks inside the culvert. At these locations, baffles, baffle inserts, or weirs may be installed to assist in keeping rocks inside the culvert, maintain and increase roughness in order to reduce velocities, and provide additional resting locations for fish as they move through the culvert." QIA requests: 64.1 Confirm if culverts that contain baffles will be monitored to ensure rock movement/accumulation or winter ice build up in the culverts do not create fish barriers during low flow periods or freshet.

TC Number:	65. Fish Barriers 2
Reference:	Environmental Protection Plan Baf-Ph1-830-P16-0008 Phase 2 Proposal Revisions - For Review Purposes Only >Rev B Section 4.7.3.1 Environmental Protection Measures – page 45 of 85

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Issue/Concern:	Baffinland states "If a culvert is to exceed 50 m in length, methods to provide light inside the culvert will be examined and considered to prevent it being a barrier to fish passage due to darkness." QIA requests: 65.1 Provide further details on mitigation measures to ensure that culverts >50 m do not become fish barriers. 65.2 Confirm if a monitoring program will be developed to ensure that fish are using and able to pass through these extended culverts. 65.3 Please describe means by which longer culverts can be illuminated

TC Number:	66. Fish Passage
Reference:	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures – page 45 of 85
Issue/Concern:	Baffinland states "Fish passage potential in culverts will be determined in consideration of culvert velocity compared to the existing watercourse, and this information will be used to reassess design velocities under the proposed conditions within the culvert." Within closed bottomed culverts water velocity usually increases with increasing culvert length and gradient. The higher the water velocity, the more difficult it is for fish to negotiate the culvert. QIA requests: 66.1 Provide the results of the fish passage potential for each culvert.

TC Number:	67. Construction During Open-Water Season
Reference:	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.3 Environmental Protection Measures – page 45 of 85
Issue/Concern:	Baffinland states "An environmental inspector shall be on on-site to assess the crossings prior to the onset of construction to confirm the absence or presence of spawning sites at least 20 m upstream or downstream of the crossing location, and whether spawning Arctic char are present in the vicinity." Arctic Char eggs incubate under ice for a period of approximately 6 months. Therefore, it is recommended that if spawning sites area identified within the area detailed above, all construction activities are stopped and construction resumes within the appropriate timing

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	window of July 1- August 31. Works during the open-water season will require works to be done in the dry and a fish salvage completed. QIA requests the following: 67.1 What is Baffinland's course of action if spawning sites are identified within 20 m upstream and/or 20 m downstream of the work area?

Surface Water Sampling Program - QA/QC Plan

TC Number:	68. Sediment Sampling
Reference:	• Attachment 31 - Surface Water Sampling Program - QA/QC Plan • 5.2.2 River and Grab Sampling – page 17 of 139
Issue/Concern:	*1. Sampling station locations will be dependent upon the monitoring program objectives and the sample location.* *2. A clean spatula or spoon will be utilized to obtain a representative sample of the sediment for analyses.* The sediment sampling procedure as currently written is missing details regarding how the sample was obtained via a grab sample. How it currently reads implies that the sample was obtained with a spatula or spoon when our understanding is that a spoon is used to transfer sediment from the sampler to the laboratory bottle. QIA requests: 68.1 Please clarify the exact procedure for sediment sampling.

Watercourse Crossings

TC Number:	69. Project Interactions and Watercourse Crossings
Reference:	• Attachment 13 • Watercourse Crossings – Attachment 13.1 Phase 2 Proposed Infrastructure Interactions with Watercourses
Issue/Concern:	After reviewing *Attachment 13.1 – Watercourse Crossings – Phase 2 Proposal Infrastructure Interactions with Waterbodies* and *Attachment 13.2 – North Railway Freshwater Habitat Survey – Appendix 1 List of Crossings, Cuts, Encroachments/Infills, and Bridges and 2018 Fish Habitat Designations* There appears to be some discrepancy between the information provided in the tables:

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	1. Potential Arctic Char and Ninespine Stickleback habitat described in Attachment 13.2 – North Railway Freshwater Habitat Survey is described as non-fish bearing (NFB) in Appendix 1 of the same document; however it is correctly referenced as Potential (POT) in Attachment 13.1 – Watercourse Crossings – Phase 2 Proposal Infrastructure Interactions with Waterbodies. It is critical that these 14 sites are correctly recognized as potential Arctic Char habitat. 2. Site CV-83-2 is identified as Arctic Char habitat in Attachment 13.1, and identified as not Arctic Char habitat in Table A1-1 (Attachment 13.2). Please confirm which habitat classification is correct. 3. Table 13.1 appears to be the most current up to date table with regards to the watercourse and associated project interaction. Please confirm that this is the case. It may be worth updating the project interactions with watercourse in Appendix 1 of Attachment 13.2 so that they present the same and most current information. It is our understanding that project interactions have changed since the fish habitat assessments were completed in 2018, however it is worth acknowledging that as of this version of the Phase 2 Application certain watercourses do not interact with the project or they have changed while still presenting the results of the aquatic habitat assessments. QIA requests: 69.1 Clarify which Table is the most up to date with the project interaction and corresponding watercourse, pond/lake. 69.2 Update both tables to ensure fish habitat is correctly defined and include 'potential' habitat for Arctic Char and Ninespine Stickleback.

AEMP

IR Number:	**70. Appendix C – Minnow Aquatic Environmental Services Recommendations**
Reference:	• Aquatic Effects Monitoring Plan • Section 3.3.5 Benthic Invertebrates – pages 58-59
Issue/Concern:	There is reference to comments provided by Minnow Aquatic Environmental Services in Appendix A, however these have not been provided to the reviewer. It is not possible for the reviewer to understand why a monitoring site is removed or added when no rationale is provided in the body of the report and the appropriate appendices are not included. QIA requests: 70.1 Provide the full comments referenced above in the AEMP.

IR Number:	**71. Indicator of Potential Eutrophication**
Reference:	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2

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	• Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks page 47 of 105
Issue/Concern:	Baffinland states, "The discharge of treated sewage effluent also has the potential to cause eutrophication, with total phosphorus (TP) being the limiting nutrient. TP concentrations are highly variable, however, making it a poor indicator. While TP will continue to be monitored as part of the CREMP, chlorophyll-a will be monitored as a more reliable indicator of potential eutrophication, as part of the freshwater biota CREMP." Phytoplankton communities are highly variable particularly in the arctic making chlorophyll-α a poor indicator of changes in trophic status. QIA requests: 71.1 Baffinland commit to continuing to use TP as an indicator of changes in trophic status.

IR Number:	**72. Nutrient Enrichment in Lotic Systems**
Reference:	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks page 47 of 105
Issue/Concern:	Baffinland states, "The primary issue of concern with respect to the phytoplankton community is related to nutrient enrichment and eutrophication, though effects on water clarity (e.g., changes in TSS) could also affect primary productivity. As such, the CREMP and the baseline data review focused upon waterbodies most at risk to eutrophication in relation to pathways of effect for the Project; in general, lakes (rather than streams) are most vulnerable to eutrophication in the Mine Area. Sheardown Lake NW will continue to receive treated sewage effluent discharge from the Mine Site Polishing Waste Stabilization Ponds (PWPs) in small volumes and may also be affected by dust deposition, stream diversions, and non-point sources. Although treated sewage effluent will be primarily discharged to the Mary River during the life of the Project, Mary Lake is the ultimate receiving environment for all point sources in the Mine Area, including discharge of treated sewage effluent, and is more vulnerable to effects of nutrient enrichment due to its lacustrine nature. The selected indicator will be chlorophyll a and the benchmark will be 3.7 µg/L." Waterbodies and watercourses most at risk of eutrophication are those that are directly receiving nutrient inputs. Nutrient enrichment in lotic systems expresses itself as aquatic plant growth including periphyton and macrophytes. Therefore, it is just as important to conduct sampling of nutrients (phosphorus and nitrogen) and primary productivity (periphyton) at sites directly receiving treated sewage effluent discharge. QIA requests: 72.1 Baffinland continue to monitor nutrients and add sampling of primary producers, in the form of periphyton, in lotic systems (such as the Mary River) receiving discharge of treated sewage effluent.

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IR Number:	**73. Primary Producer Sampling at Reference Sites**
Reference:	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks • Table 3.8 Reference Areas for the Mary Lake System page 48 of 105
Issue/Concern:	Baffinland States, "Water quality changes (primarily nutrients and total suspended solids [TSS]) related to discharge of treated sewage effluent (immediate receiving environments: Mary River and Sheardown Lake NW). and that "The discharge of treated sewage effluent also has the potential to cause eutrophication, with total phosphorus (TP) being the limiting nutrient. TP concentrations are highly variable, however, making it a poor indicator. While TP will continue to be monitored as part of the CREMP, chlorophyll-a will be monitored as a more reliable indicator of potential eutrophication, as part of the freshwater biota CREMP." In Table 3.8 it is indicated that phytoplankton are not sampled at the Mary River Reference sites G0-09-A, G0-09, G0-09-B. Given that Mary River is the primary receiver of treated sewage effluent and Baffinland wants to evaluate nutrient enrichment primarily by chlorophyll-α, it is recommended that Baffinland collect samples of phytoplankton and periphyton at the reference sites G0-09-A, G0-09 and G0-09-B.

IR Number:	**74. Profundal Sediment Stations in Sheardown Lake SE**
Reference:	Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 Section 3.3.3 Sediment Quality Study Design page 53 of 105 Table 3.12 Profundal Sediment Quality Stations page 55 of 105 Figure 3.3 page 57 of 105
Issue/Concern:	Baffinland states, "Continue sediment quality monitoring at three (3) existing sediment quality stations located in profundal (deep) habitat at Reference Lake 3 and each mine exposed study lake, with the exception of Sheardown Lake SE, where profundal habitat is limited to only a small proportion of the lake (Minnow Recommendation 17; Minnow, 2016)." In Figure 3.3 there are two profundal sites that are highlighted green indicating they are recommended as Lake Profundal Sediment Stations in Sheardown Lake SE, however in Table 3.12 no sites are included for Sheardown Lake SE. QIA requests: 74.1 Clarify if the number of profundal sediment stations in Sheardown Lake SE is being reduced to two or if profundal sediment stations are being eliminated entirely.

IR Number:	**75. Discharge Location of Ore Stockpiling Area at KM 57**

Reference:	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 • Section 2.4.5.3 Tote Road and Northern Railway (Water Management Area 48) page 32 of 105
Issue/Concern:	Baffinland states, "As part of Phase 2, a temporary ore stockpiling area at KM 57 of the Northern Railway will operate for 1 to 2 years during rail construction. This transfer area will facilitate the movement of ore from haul trucks to railcars. The haul trucks will deliver ore to the ore staging area from the Mine Site via the Tote Road. The ore will be loaded on railcars using front-end loaders. Once loaded the train will proceed north to Milne Port. Runoff from the stockpiles will be collected and directed to a stormwater pond. Runoff from the ore stockpiles at this facility will be directed to the KM 57 Ore Stockpile Facility Pond. Discharge from the stormwater pond will be monitored to confirm it meets the requirements outlined in the current Type A Water Licence and effluent collected in this pond will be sampled to confirm it meets the mine effluent discharge criteria specified in the Licence before applying the water to the Tote Road as part of dust suppression efforts." QIA requests: 75.1 Provide further details on the anticipated discharge location, the monitoring site label, the parameters to be sampled and the frequency of sampling.

IR Number:	**76. Fish Ageing**
Reference:	Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 Section 3.5.3 Fish page 65 of 105
Issue/Concern:	Baffinland states "The fish ages will be determination by experienced technicians and a minimum of 10% of fish ageing structures that are processed will be independently and blindly aged by a second technician." QIA requests: 76.1 Confirm that fish ageing structures will also be aged by an accredited laboratory with expertise in processing fish ageing structures to confirm technician results.

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TC Number:	77. Feasibility of Restoring Natural Drainage in Disturbed Areas
Reference	• ICRP – 1. Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 13
Issue / Concern	"Disturbed areas would undergo contouring of ground or granular surfaces as required to maintain stability and natural drainage patterns will be re-established, if required, as reasonably possible." QIA requests:

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	77.1 How will feasibility of restoring natural drainage be assessed as reasonably possible or not and how will the decisions be documented? 77.2 What factors will be considered and what would prevent re-establishment of natural drainage at closure?

TC Number:	78. Total Number of Quarries
Reference	ICRP Section Plain Language Summary PROJECT AND CLOSURE SUMMARY, p. 14
Issue / Concern	"Following the closure activities, there will be several long-term landform changes, including:… several small quarries will be visible landforms." QIA requests: 78.1 Please clarify the number of quarries in the Phase 2 project. 78.2 How many are anticipated to remain as visible landforms following closure?

TC Number:	79. Mitigations for Unacceptable Pit Water Quality
Reference	• ICRP • Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 18 and Table 1.1 • Section 5 – Permanent Closure and Reclamation, Table 5.1 • Sect. 5.2.1.2 p.102
Issue / Concern	Table 1.1 "Water treatment is not expected to be required at the Open Pit and Waste Rock Stockpile." p.18 "Following reclamation, all Project areas are expected to be physically and chemically stable. Excluding the Open Pit and Waste Rock Stockpile areas, water quality is predicted to return to pre-disturbance levels" Table 5.1 "At present, water quality predictions for the Open Pit and Waste Rock Stockpile discharges and receiving waterbodies indicate that risk based criteria and/or risk management strategies may be required." "The FEIS predictions for pit water quality indicate that there could be potential exceedances for substances that could cause a risk to humans (such as mercury) and the receiving environment (Appendix H, Table 4). … Baffinland plans to refine the Pit flooding estimates and water quality predictions in the future using site data. This work is required to develop meaningful criteria." Sect. 5.2.1.2 p.102

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	” It is anticipated that the discharge from the open pit will not require treatment (AMEC 2010), although there is some uncertainty in this prediction and consequently Baffinland has identified this as a focus of their Reclamation Research Program (Appendix D).” QIA requests the following: 79.1 In the event that refinements do not reduce risk to acceptable levels, what mitigation options are available and when could they implemented?

TC Number:	80. Fate of Dock at Milne Port
Reference	ICRP Sect 5.2 p. 100 Permanent Closure and Reclamation Requirements
Issue / Concern	“The main work items for final mine closure and reclamation include: … Removal of all mining and transportation infrastructure other than the Open Pit, Waste Rock Pile, Milne Port Tote Road, and Milne Port Docks. The Milne Port Tote Road and Docks will be left in place after the Project life, but not maintained.” QIA requests the following: 80.1 If docks are left in place but not maintained, are they likely to deteriorate over time? 80.2 How does this fit the Closure Objective of physical stability?

Enhanced Pit Filling

TC Number:	81. Enhanced Pit Filling
Reference	• Sect. 5.2.1.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES. Enhanced Pit Filling Alternative Table 5.2 p.103-104 • Sect. 5.2.1.7 p. 106
Issue / Concern	Enhanced Pit Filling Alternative Table 5.2 and pp. 103-104 review alternative sources of water and for refilling the pit, given the conclusion that reliance on natural inflow would take 85-150 years. Three alternatives are rejected as: a) not providing sufficient water b) too distant from the pit c) requiring continuous pumping year round. Pumping of 30% of the mean annual flow of the Mary River would refill the pit in 2 years and the river is <1km from the pit, but 60-70% of the total annual flow occurs in the 30-35 day freshet period. Baffinland concludes “Assuming pumping continues 24 hours a day for the entire summer period this would require a pumping system that could deliver 8,700 m3/hour, over approximately a 1 km distance and an approximate elevation head of 200 m. “. Table 5.2 indicates that the pit volume is ~46,000,000 m3, such that it could be filled in 1.8 years of continuous pumping from June to September at 8700 m3/hr. Overall, Baffinland concludes (p. 105) – *“Given these conditions it is expected that continuous pumping would not be a technically and economically feasible option.”*

<table>
<tr><td></td><td>5.2.1.7 p. 106 “There is uncertainty regarding the infilling rate of the open pit. … This concern has been highlighted by stakeholders, and Baffinland will proactively address this issue within the Reclamation Research Plan. A detailed description of the planned research is presented in Appendix D.”

Table 5.2 indicates that the pit volume is ~46,000,000 m3, this indicates that the pit could be filled in 1.8 years of continuous pumping from June to September at 8700 m3/hr.
Baffinland provides no conclusion on the feasibility of the summer pit filling scenario from the Mary River and so the time line for pit refilling is uncertain. Does Baffinland consider that continuous summer pumping (June September) from the Mary River is feasible?
Baffinland has not provided any feasible scenario of pit refilling
In the absence of a favourable scenario for enhanced pit closure, does Baffinland consider that 85-150 years to fill the pit from natural runoff is a viable closure option?
The schedule and means of pit refilling has not been established in this application and has great implications for pit water quality at closure. Approval of the application in the absence of demonstrated feasibility of a) the rate of pit filling and b) implications to closure water quality is premature.

QIA requests:
81.1 Please provide a schedule and source of water for pit refilling that Baffinland considers to be feasible and which can be used to predict pit water quality at closure.</td></tr>
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<tr><th>TC Number:</th><th>82. Timing of Reclamation Research</th></tr>
<tr><td>Reference</td><td>p. 10-6 Sect. 5.2.17 Uncertainties</td></tr>
<tr><td>Issue / Concern</td><td>5.2.1.7 states “The mining plan and the ongoing geochemical characterization plan will inform the prediction modelling for mine pit water quality at the end of mine life as presented in the Life-of-Mine Waste Rock Management Plan”

and

5.2.19 states “Reclamation Research to address the uncertainty of what closure and post closure activities are required to ensure open pit runoff water quality meets closure objectives and criteria, including ML/ARD issues, is expected to commence at approximately Year 10 of Operations (when an Open Pit is expected to exist associated with the Project).”

Reclamation Research that commences at Year 10 of operations does not provide the necessary assurance of chemical stability at closure and details are required to inform the Water Licence.</td></tr>
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	QIA requests: 82.1 Provide feasible mitigation and closure options for the open pit that address the need for chemical stability and acceptable water quality.

TC Number:	83. Treatment of Pit Water
Reference	ICRP Sect 5.2.1.9 Contingencies p. 107
Issue / Concern	Several "theoretical" options for treatment of metals and nitrogen species from pit water are proposed. The feasibility of treatment varies with the type of treatment required. QIA requests the following: 83.1 Are the options provided feasible for batch treatment of the pit or for ongoing treatment of pit discharge at closure ? 83.2 Does Baffinland foresee a scenario in which ongoing treatment of pit discharge is required over the long term at closure?

TC Number:	84. Fate of Overburden
Reference	ICRP Sect. 5.2.2.1 p. 108 Waste Rock and Overburden Piles
Issue / Concern	"30 Mt of overburden will be generated from the mining of Deposit No. 1" and "The Waste Rock Stockpile design has sufficient capacity to stockpile the entire volume of waste produced by the mine plan." Organic and finer grained overburden is a reclamation resource yet it appears to be considered as a waste. QIA requests: 84.1 Confirmation if the overburden be isolated and used to promote revegetation of disturbed sites at mine closure.

TC Number:	85. Updated Climate Change Predictions for Long Term Closure
Reference	• ICRP Section 5.2.2. Waste Rock and Overburden Piles • D.3 Reclamation Research Program - Waste Rock Stockpile Seepage/Runoff Water Quality, p. 303
Issue / Concern	Much of the long-term stability of waste rock and runoff is dependent on development of permafrost and conveyance of runoff and seepage in ditches. Sect. 5.2.2. p. 118 cites IPCC (2007) as the source of long term (200 year) predictions of climate.

	D3 p. 303 states *"The "active" zone is not anticipated to extend into the PAG material through 50 m non-PAG shell in the long-term (within 200 years) under the influence of climate change (Intergovernmental Panel on Climate Change, 2007)."* These predictions may be outdated and climate change is proceeding more rapidly than predicted. IPCC Assessment Report #5 was issued in 2014 and AR#6 is in the process of finalization. In addition, NRCAN (2019) produced updated records of observed changes and detailed predictions of changing temperature and precipitation specific to Canadian regions in 2019. *.Bush, E. and Lemmen, D.S., editors (2019): Canada's Changing Climate Report; Government of Canada, Ottawa, ON. 444 p www.ChangingClimate.ca/CCCR2019.* Closure planning based on 2007 climate predictions may not be accurate QIA requests the following: 85.1 What climate change scenarios have been considered in the modelling? 85.2 What sensitivity assessments have been made on rate and magnitude of permafrost and runoff? 85.3 Compare the climate change predictions from 2007 that were used in the closure plan development with the most recent modelling completed in 2019 and comment on the implications to permafrost development and runoff management at closure.

TC Number:	86. ARD in Waste Rock
Reference	ICRP 5.2.2.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 116
Issue / Concern	Weak ARD developed in the waste rock in 2017 and a treatment plan was developed. QIA requests the following: 86.1 Was this predicted from geochemical modelling and testing? 86.2 How has this development been considered in the closure planning?

TC Number:	87. Mitigations for Seepage and Runoff
Reference	5.2.2.6 PREDICTED RESIDUAL EFFECTS p. 119
Issue / Concern	The FEIS predicted potential water quality exceedances for Hg and Se in Camp Lake and Tributaries L1 and L0 and for Hg, Se and Ag in the east pond discharge – data will be collected as the project proceeds to assess accuracy of these predictions and to assess performance of mitigation and management options.

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	QIA requests: 87.1 Please describe the mitigation options available to control Hg, Se and Ag in seepage and runoff from the site and whether these are suitable for long term deployment or batch/short term mitigation. 87.2 Please include a Response Framework, Triggers and Action Levels for implementing enhanced mitigation for site runoff and seepage in the closure and post closure environment.

TC Number:	88. Fate of Dock Infrastructure and Sewage Treatment Plant
Reference	ICRP Sect. 5.2.5.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITION ICRP 5.2.8.5 p. 152
Issue / Concern	"Dock infrastructure at Milne Port will be removed and either recycled, shipped offsite to an appropriate facility for disposal, or deposited within onsite landfill, the open pit or other approved repositories." 5.2.8.5 states "The remaining sewage treatment plant components will be either transported for sealift to the mainland for disposal or salvaged or disposed of in the onsite landfill." QIA requests: 88.1 Will infrastructure be removed from the site or disposed on site (i.e. in waste rock piles or open pits)? 88.2 What criteria will be used to determine fate and disposal?

TC Number:	89. Fate of Ore and Freight Docks
Reference	ICRP 5.2.6.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 135 ICRP 5.2.6.5 p. 136
Issue / Concern	p. 135 "the Milne Port ore and freight docks will remain in place to provide ongoing fish habitat and will potentially be utilized for local community use following closure." p. 136 "The Ore and Freight docks at Milne port will remain in place with all surface infrastructure removed. The ore docks may potentially be used by communities, subject to approval by the land owner (CIRNAC)." QIA requests the following: 89.1 What community uses have been identified for structures that are >100km from any existing communities? 89.2 Has Baffinland documented whether a community has specifically identified a need for the dock post closure? 89.3 Have CIRNAC or the communities indicated any agreement to assume liability for the ore docks?

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TC Number:	90. Depth of Overburden over Landfills
Reference	5.2.7.2 p. 144 and 5.2.7.5 p.146 Landfills
Issue / Concern	Project landfills will be progressively covered with overburden, as cells are completed, to allow the contents of the landfill to remain permanently frozen to physically and geotechnically stabilize …. The onsite landfill located at the Mine Site will be reclaimed by capping the landfill with 1.5 m of overburden or equivalent material to freeze the core of the landfill. QIA requests: 90.1 Confirm if the proposed depth of overburden cover incorporate predictions for a warmer climate to accommodate a deeper active layer over time?

TC Number:	91. Effluent Criteria for Water Management Ponds at Closure
Reference	ICRP 5.2.8.5. p. 152 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY
Issue / Concern	"The site water management ponds (Off-spec, Stockpile Settling Ponds, etc.) will be decommissioned when they are no longer required and water quality is found to consistently meet effluent criteria" QIA requests: 91.1 What are the proposed effluent criteria for closure and what is the predicted timeline to meet the criteria?

TC Number:	92. Approach to Assessing Hydrocarbon Contaminated Soils
Reference	ICRP 6.2.1.1. Land Farm Operation, p. 155
Issue / Concern	"Hydrocarbon-contaminated soils will be assessed against Nunavut Contaminated Site Remediation Tier-1 Guidelines" (p. 155) but "Another approach that may be utilized is a risk-based methodology for the establishment of hydrocarbon criteria that are protective of human and ecological health. The methods to be followed are outlined Canadian Council of Ministers of the Environment (CCME) Canada Wide Standards for Petroleum Hydrocarbons (PHC) In Soil (2008)." QIA requests: 92.1 Explain why the CCME (2008) risk-based methodology may be preferable to guidelines that are specific to Nunavut? 92.2 What criteria would influence a decision to use the CCME protocol?

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TC Number:	93. Care and Maintenance
Reference	ICRP 7.1 SHORT-TERM TEMPORARY MINE CLOSURE – CARE AND MAINTENANCE p. 159
Issue / Concern	Care and maintenance of the Project sites will be implemented and executed by operational maintenance staff and other support personnel on site and will be carried out within approximately six (6) months of the initiation of the Temporary Closure Care and Maintenance phase based on the level of effort required. QIA requests: 93.1 Confirm if Baffinland has developed a list of all necessary temporary closure activities in order of importance to guide execution of temporary closure and inform the level of effort required.

TC Number:	94. Fate of Rails and Ties
Reference	Figure 8.1 Final Closure Schedule
Issue / Concern	Rails and ties will be removed from the railway at Final Closure. QIA requests: 94. Confirm where and how will rails and ties be disposed. Will they be disposed of on-site or off-site?

TC Number:	95. Pit Fill Timeline
Reference	• ICRP Pit Flooding • Also See QIA TC "Enhanced Pit Filling"
Issue / Concern	Figure 8.1 - Final Closure Schedule indicates that pit flooding will take place over 15 years. Section 9.2 p. 178 *"At this time, the only infrastructure that will require continued maintenance is the pit flooding equipment, which is anticipated to be completed between year 8 and year 15"* 9.4.2 p. 184 *"It is assumed that enhanced pit filling will take ten (10) years to complete."* 9.5 p. 185 *"…Baffinland has tentatively assumed a flooding period of 10 years could be achieved"* In Section 5.2 (see QIA-ICRP#9) Baffinland does not provide a feasible scenario for pit refilling and indicates that this is a research need. QIA requests the following: 95.1 Which enhanced flooding scenario does the 10 year timeline assume and what are the associated sources and water withdrawal rates?

TC Number:	96. Guidelines for Assessing Hydrocarbon Contaminated Soils

Reference	9.6 Environmental Site Assessment p. 190
Issue / Concern	9.6 p. 190 states "Soil materials found to exceed the appropriate cleanup criteria for hydrocarbons (based on CCME contaminated sites guidelines or site-specific risk based criteria) will be remediated onsite in the landfarm units, removed offsite to a licensed waste management facility, or the risk will be managed using site controls (e.g. covers)." But 6.2.1.1. states that "Land Farm Operation Hydrocarbon-contaminated soils will be assessed against Nunavut Contaminated Site Remediation Tier-1 Guidelines (p. 155)" QIA requests: 96.1 Confirm which guidelines will be used in the ESA process and that the guidelines chosen are protective of the environment.

TC Number:	97. Pit Water Quality
Reference	Appendix D1 Reclamation Research Program – Open Pit Water Quality p. 293
Issue / Concern	The mass loading modelling indicated that Level I magnitude effects to water quality will occur under low flow conditions, with a calculated HQ between 1 and 10 for mercury, selenium and silver. It is noted that an HQ >10 was calculated for mercury within the F0 tributary, upstream of fish presence or habitat; Based on pit water quality for Year 21 of mining, it is possible the water will have a pH of around 4.2, which is outside of the pH range of the MDMER (6.0 to 9.0) however the mass loading modelling carried out is based on conservative assumptions … The potential for high Hazard Quotients and pH 4.2 in pit water at closure represents a serious threat to post closure water quality. Although BMI are carrying out additional research further discussion is warranted at this stage to assess next steps. QIA requests the following: 97.1 Describe what elements of conservatism in the pit water quality model result in the predicted water quality at closure. 97.2 Describe the origin of the conservative model inputs and compare with realistic measured values. 97.3 Provide a range of modelling outcomes based on a realistic range of pit conditions (or varying conservatism) at closure and explain which scenarios are most likely. 97.4 Provide a comparison of the short term and long term water quality in the pit lake at closure and describe how the chemistry of the lake may change once the pit is flooded.

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TC Number:	98. Pit Meromixis
Reference	Research Task – Pit Lake Meromixis p. 297
Issue / Concern	"Research into meromictic pit lakes has not yet been completed. This work is scheduled to start in 2019." QIA requests the following: 98.1 Provide an update on the status of the meromixis research program, any findings to date and comment on whether meromixis is proposed as a closure option for the pit lake.

TC Number:	99. Open Pit Water Quality Research Results
Reference	ICRP Research Task Open Pit Water Quality Research Results p. 297
Issue / Concern	Open Pit Water Quality Research Results - No results have been provided yet as the mine has not advanced into the open pit stage. Ore has, to date, been extracted from the hillslope, rather than the future open pit. Although the pit has not yet been advanced, the characteristics of the ore body are likely to be the same above and below grade and we presume that geochemistry tests would have been completed for exploration and ore body delineation samples as part of mine feasibility. QIA requests the following: 99.1 What geochemical tests have been completed on the ore body to date? 99.2 Provide the status of any humidity cell tests on ore characteristics. 99.3 Compare the above results to the inputs to the pit lake model and comment on the conservatism of the pit water quality model. *We note that such testing was completed on the waste rock (D.3 Reclamation Research Program - Waste Rock Stockpile Seepage/Runoff Water Quality)* 99.4 What existing results could be used to test the conservatism of the water quality model?