Stephanie Autut
Executive Director
Nunavut Water Board

November 4, 2021

Re: Application for Amendment to Water Licence No. 2AM-MRY1325 associated with the "Phase 2 Development" Project Proposal submitted by Baffinland Iron Mines Corporation

Dear Stephanie,

Please find enclosed a copy of Baffinland Iron Mines Corporation's ('Baffinland') responses to technical comments received on in relation to the Application to Amend Type A Water License 2AM-MRY1325, August 2018, updated September 2021 (the 'Application') for Phase 2 of the Mary River Project.

Comments were received from Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Environment and Climate Change Canada (ECCC), and the Qikiqtani Inuit Association (QIA). Fisheries and Oceans Canada (DFO) has indicated they will provide updated comments in advance of the technical meeting to be held on November 12, 2021.

A partial submission with responses to a majority of the technical comments was provided on November 2, 2021. This submission provides responses to the full list of technical comments, including the responses that were not included in the November 2, 2021 submission. Baffinland reiterates that it will also work directly with Parties to advance issue resolution prior to the technical meeting.

For any questions or clarifications please do not hesitate to contact the undersigned for further information.

Best Regards,

Lou Kamermans
Senior Director – Sustainable Development
Baffinland Iron Mines

cc: Karen Costello, Cory Barker, Tara Arko (NIRB)
Karén Kharatyan, Assol Kubeisinova (NWB)
Jared Ottenhof, Chris Spencer (Qikiqtani Inuit Association)
Bridget Campbell (CIRNAC)
Alasdair Beattie, Alexandra Sorckoff, Gabriel Bernard-Lacaille (DFO)
Margaret Fairbairn, Melissa Pinto (ECCC)
Megan Lord-Hoyle, Steve Borcsok (BIM)

Responses to October 2021 Technical Comments
Application to Amend Type A Water Licence 2AM-MRY1325

November 4, 2021

Baffinland Iron Mines Corporation
Mary River Project – Phase 2 Proposal
Type A Water Licence No. 2AM-MRY1325

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CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

ID#	Document Reference	July 2019 Recommendations/Requests	Baffinland's August 2019 Response	Intervenor's October 2021 Status Update	Intervenor's October 2021 Recommendations/Requests	Baffinland's November 2021 Response	Attachment
CIRNAC-TR#1	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Section 4.3 and Attachment 29 Interim Waste Rock Management Plan (Golder 2019); Section 2	1) CIRNAC maintains our request that the updated Phase 1 Waste Rock Management Plan that BIMC committed to developing by the end of December 2019 be provided to CIRNAC for review. 2) CIRNAC recommends that the Phase 1 Waste Rock Management Plan be finalized and approved prior to initiating the increased ore production rate associated with Phase 2. 3) In addition, CIRNAC requests that BIMC continue to provide CIRNAC frequent updates on other research plans and activities that directly or indirectly relate to predictions of waste rock geochemistry, seepage and water quality as they become available.	Baffinland will submit the updated Phase 1 Waste Rock Management Plan (WRMP) in December 2019. Baffinland maintains that this is an operational document, and that approval of this plan is independent of the Phase 2 process and will be required regardless of the permitting timeline for Phase 2. Updates on the investigation and strategy to address the Waste Rock Facility have been regularly provided to all stakeholders, and Baffinland will continue to engage all interested parties to provide updates.	R-01 Resolved			
				R-02 Ongoing		While Baffinland maintains that the Ph1 WRMP is independent of the Phase 2 Proposal, we agree to have this plan reviewed and approved before initiating the increased ore production rate associated with Phase 2. Note the Rev B version of this plan included with the Updated Water Licence Application is consistent in content with the Rev 3 but with additional adaptive management including a trigger action response plan.	
				R-03 Ongoing		Yes, Baffinland has been and will continue to provide updates to CIRNAC on research plans and activities that directly or indirectly relate to predictions of waste rock geochemistry, seepage and water quality.	
CIRNAC-TR#2	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Section 4.3 and Attachment 29 Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e); Sections 5.2.1.1 to 5.2.1.9 and Appendix D1 and D2 Research Plans CIRNAC IR #3; CIRNAC, November 23, 2018	4) CIRNAC recommends that prior to commencing work on the advancement of the open pit, BIMC demonstrate a thorough understanding of the future pit conditions including methods and timelines for pit flooding, geochemistry and ARD/ML potential of waste rock and pit walls based on information/data obtained through the numerous research commitments stated in the ICRP. Periodic updates to the ICRP will need to be completed to include the results of research programs and their implications with respect to pit development and closure planning.	Deposit 1 remains a hilltop outcrop, and development of the pit was projected to occur after 10 years of full-scale production for the Approved Project. Baffinland has committed to reclamation research through the most recent revision of the ICRP so that prior models on pit flooding, geochemistry and ARD/ML potential presented in the FEIS can be validated with observations from active mining of the deposit and further assessment of local hydrology. Results of the reclamation research programs will be incorporated into future versions of the ICRP, as intended.	Commitment		Baffinland will continue operational monitoring and advance studies to refine closure predictions related to future pit conditions. The requirement to further refine modelling for pit flooding and water chemistry is built into the ICRP, which states in Section 5.2.1.4 that "The mining plan and the ongoing waste rock characterization plan will inform the prediction modeling of the mine pit water quality at the end of mine life." A specific condition is not required in the Water Licence for this work, given the ICRP forms part of the Licence.	
CIRNAC-TR#3	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e)	5) CIRNAC requests that BIMC update the ICRP to appropriately address the issue of information gaps by including missing information, or updating contradictory or outdated information, in the sections identified in TR#3.	Baffinland appreciates the review and feedback provided by CIRNAC on the ICRP and will incorporate these comments into the updated draft of the ICRP to be provided in advance of the Technical Meeting.	Ongoing		Baffinland commits to incorporating CIRNAC's comments in the updated ICRP and reclamation security estimate, aiming for prior to the NWB public hearing. The timing is contingent on advancing work on the ICRP with the Qikiqtani Inuit Association.	
CIRNAC-TR#4	Mary River Phase 2 Proposal Update	6) CIRNAC requests that the Blasting Management Plan and the Quarry	The QMR2 Quarry Management Plan will be updated if the quarry limits require expansion.	Resolved			

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	(Knight Piésold 2019, May 2, 2019)	Management Plan QMR2 are submitted for review in advance of the Technical Review meeting.	Updates to Quarry Management Plans for quarries on Inuit-Owned Land are managed under Baffinland's Commercial Lease. The Blasting Management Plan will be reviewed to determine its adequacy for rail construction, and if updated, will be provided for review in advance of the technical meeting.				
CIRNAC-TR#5	Mary River Phase 2 Proposal Update (Knight Piésold 2019, May 2, 2019) Railway Emergency Response Plan (Baffinland, May 13, 2019) Railway Operation and Maintenance Management Plan (Baffinland, May 13, 2019); Section 9.2 Attachment 28 - Environmental Protection Plan (Baffinland, May 1, 2019); Section 2.26	7) CIRNAC recommends that the Railway Emergency Response Plan be further updated to include the following information: a. Procedures identifying the medical services that should be contacted in the event of injuries, the first aid responses that should be executed at the site of the accident, and the modes of transportation that should be used for injured persons depending upon the location of the accident and ambient conditions. b. Company personnel and government departments that require advisories of an accident/incident. c. Type and location of emergency equipment and the procedures to be followed in the event of a derailment, including check lists and accident reports; and d. Information on health and safety emergencies.	A revised version of the Railway Emergency Response Plan is provided in Attachment 01. This draft Plan will be updated further prior to the commencement of railway operations.	Resolved			

CIRNAC-TR#6	Modification Request No. 12 – Milne Port Stockpile #1 and Water Management Expansion (Baffinland, May 3, 2019); Attachments 3, 4 and 5 Modification No.12 Attachment 5 – Civil Design Philosophy (Hatch 2018); Section 6.6	8) CIRNAC recommends that BIMC revise its design storm criteria from the 1:10yr 24 hour to a minimum of 1:25 year storm for the design of the new sedimentation ponds at the Milne Port associated with the expansion of the stockpile facilities. 9) CIRNAC recommends that BIMC revise its Civil Design Philosophy design storm criteria from the 1:10yr 24 hour to a minimum of 1:25 year storm for the design of any future permanent Life of Mine sedimentation ponds.	Sedimentation ponds designed for the Approved Project have utilized the 1:10 24 hr storm presented in the Civil Design Philosophy. Application of this design criteria for new infrastructure is consistent with its previous application.	R-08 Ongoing R-09 Ongoing	Appropriate planning, design, and construction of facilities is needed for the effective management of site water erosion and sedimentation to ensure potential impacts are minimized during all times of the year over the life of the project. CIRNAC reiterates recommendation numbers R-08 and R-09 that BIMC revise its storm design criteria for sedimentation ponds and suggests that BIMC also assess the feasibility of expanding existing sedimentation ponds to meet the MSWMP design criteria. CIRNAC supports the initiative to address the past and ongoing erosion issues at the Mine Site and would appreciate additional schedule details on implementation of the plan.	With respect to CIRNAC's request to expand the existing sedimentation ponds to the design criteria adopted in Modification Request No. 13, the existing crusher pad pond will be replaced by a future SDLT-1 pond designed to the Modification Request No. 13 criteria. The design criteria for the WRF pond will remain unchanged for now, as the current design criteria (1 in 10-year, 15-day storm; 310 mm) reflect both the expected lifespan of that facility as well as the holding time required for water treatment. As part of ongoing water management planning at Milne Port, Baffinland is currently evaluating the appropriate design criteria considering site-specific conditions including the lifespan of the facilities, our experience with settling times before discharge, and site-specific climatic conditions at Milne Port, which notably drier compared to the mine. The schedule for implementation is presented in Modification Request No. 13.	
CIRNAC-TR#7	Mary River Phase 2 Proposal Update (Knight Piésold 2019, May 2, 2019) Railway Operation and Maintenance Management Plan (Baffinland, May 13, 2019); Section 3.3	10) CIRNAC requests that dust monitoring data and any other relevant information, if available, are provided to assess potential environmental impacts to surface water/snow from dust generation along the northern transportation corridor from the railway and truck traffic.	Information on the low potential for ore dusting from rail cars is provided in an email to the GN following a Terrestrial Environment Working Group meeting on Phase 2 management plans, dated Feb 14, 2019, and provided as Attachment 02. Baffinland's ore dusting exposure assessment (TSD 11) reviewed the chemistry of dustfall from stations along the Tote Road and at the Mine and Port, and this demonstrated that while the ore dust at the Project sites has the chemistry resembling the ore, the dust generated by the Tote Road does not have chemistry resembling the ore. Dust monitoring data is reported annually to the NIRB through the Terrestrial Environment Annual Monitoring Report, which can be found in the NIRB public registry or on Baffinland's document portal (http://www.baffinland.com/document-portal-new/?cat=5&archive=1)	Ongoing	To confirm predictions, CIRNAC maintains recommendation R-10 that BIMC continue to monitor dust deposition impacts from ore blow-off on the freshwater receiving environment throughout the lifetime of the project, to provide updates as they become available, and implement approved mitigations if significant effects are observed. CIRNAC would consider this comment resolved with a commitment from BIMC.	The lakes and streams within the Mine Site receive comparatively high levels of deposited ore dust, compared to the transportation corridor, as acknowledged by CIRNAC. For this reason, the Aquatic Effects Monitoring Program at the mine includes a lake sedimentation monitoring program in Sheardown Lake NW. If ore dust generated by the Project had the potential to adversely affect fish populations, it would be detected first by this monitoring program. In response to the QIA's Final Written Submission QIA-41 in the NIRB review, Baffinland committed to lower the lake sedimentation threshold in this monitoring program (Commitments 148 and 200). The latest draft SWAEMP (Attachment 22 of the Updated Application) adopts the lower sedimentation threshold.	

CIRNAC-TR#8	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e)	11) CIRNAC requests that BIMC update the ICRP to appropriately address the concerns raised in TR#8 surrounding insufficient financial security by updating the ICRP to increase Interim Care and Maintenance and Post Closure Monitoring time as suggested by CIRNAC.	Baffinland appreciates the review and feedback provided by CIRNAC on the ICRP and will incorporate these comments into the updated draft of the ICRP to be provided in advance of the Technical Meeting. Baffinland does not believe an adjustment to security is required for the open pit, as the deposit remains a hilltop outcrop and not an open pit. As security for the project is currently revised on an annual basis, there is no need to assess and hold security for a scenario that has not yet occurred and will not in the coming year.	R-11 Ongoing		Future iterations of the ICRP will evaluate the need for increased Closure and Post Closure Monitoring. Baffinland maintains that the duration of closure activities (3 years) is adequate given the total person-hours required to execute the closure and assumed crew sizes, and that the post closure monitoring phase is sufficient given that there are no significant adverse residual effects identified in the FEIS for VECs or VSECs associated with the Project.	
		12) Given current measured acidity in waste rock seepage, CIRNAC recommends that a cost for open pit water treatment be included in the security until such time that treatment is shown to not be needed.		R-12 Ongoing		Baffinland maintains that no adjustment to security is required for the open pit, as the deposit remains a hilltop outcrop and not an open pit. There is no need to assess and hold security for a scenario that has not yet occurred and will not for a number of years.	
CIRNAC-TR#9	Nunavut Water Board Water Licence No. 2AM-MRY1335 – Amendment No. 1, Baffinland Iron Mines Corporation, Mary River Iron Mine, Signed by Thomas Kabloona on July 21, 2015.	13) CIRNAC proposes that all parties use the opportunity for any future amendments to Water Licence 2AM-MRY1325 – Amendment No. 1 to change the procedure for the Annual Security Review to one of the following options: a. A phased approach with security applied in tranches, as is used on other mining projects; b. Decreasing the frequency of the security review to occur every 5 years rather than every year; or c. Other suggestions made by interested parties.	Baffinland agrees with CIRNAC that the current amendment to the Type A Water Licence provides an opportunity to review current practice for setting and updating security for the project and is open to considering changes, subject to further review and discussion with all parties. Baffinland recognizes that QIA as the landowner will ultimately need to approve any changes to the security review process. Baffinland will engage QIA on this matter and any agreed upon path forward will be presented to the Board.	Ongoing		Baffinland continues to agree with CIRNAC that the current amendment to the Type A Water Licence provides an opportunity to review current practice for setting and updating security for the project and is open to considering changes, subject to further review and discussion with all parties. Baffinland is open to discussing options during the technical meeting but recognizes that QIA as the landowner will ultimately need to approve any changes to the security review process.	

CIRNAC-TR#10	Borrow Pit and Quarry Management Plan, Section 3.0, Implementation, Section 5.0, Monitoring; WL 2AM-MRY1325 - Amendment No. 1, Part D Item 9			New	14) CIRNAC recommends that BIMC provide additional text in the plan to discuss the development of the borrow sources and their impact on the permafrost regime on a borrow-by-borrow source/quarry-by-quarry evaluation. Furthermore, CIRNAC recommends details also be provided on how borrow area development will be done on a case-by-case basis to minimize the potential long-term damage to the permafrost regime.	Most of the material for rail construction will be from rock quarries and not borrow pits. Nonetheless, overburden (some of which may be ice-rich) will be encountered during quarry development. Geotechnical investigations to date provide some delineation of ice-rich and ice-poor areas as a starting point for understanding which quarries pose a potential concern from a permafrost perspective. Baffinland plans to complete exploratory drilling to verify material characteristics and overburden thicknesses that require stripping, and to identify the presence of ice or thaw-sensitive soils that can either be avoided or planned for in quarry design. Identified permafrost issues will be managed by applying measures identified in each quarry-specific management plan. Generic measures for dealing with permafrost during borrow pit development are described in Appendix D of the Borrow Pit and Quarry Management Plan. Designs established for excavations and cuts in ice-rich and ice-poor soils along the railway will be applied to excavations in overburden encountered in the rock quarries. Slopes will be monitored against any destabilizing of the cut surfaces. If necessary, cover materials will be placed or cut slopes altered to reduce potential thawing. **Commitment**: The above additional text will be added to the Borrow Pit and Quarry Management Plan.	
CIRNAC-TR#11	Geotechnical Studies - Geotechnical Recommendations for North Railway, Hatch, Rev. 0, Apr. 26, 2019			New	15) CIRNAC recommends that BIMC undertake supplementary investigation work within the Route 3 realignment to complete the geotechnical assessment of the Northern Railway and integrate the findings into a management strategy to minimize the impact of construction on permafrost.	A geotechnical field program was recently completed in summer 2021. Laboratory testing work is currently underway, and the results and an updated report will be made available when the work is completed. Baffinland expects this work will be complete by February/March 2022. This work will inform design but will not further influence the overall alignment in a major way.	

CIRNAC-TR#12	AEMP; BMP; FWSSWMP			New	16) CIRNAC recommends that the following updates, which have not been addressed in other TRCs, be made to the Management Plans listed. a) Aquatic Effects Monitoring Plan: provide for review prior to the Technical Meeting. b) Blasting Management Plan: Update to include procedures and blasting of frozen ground and for spoils management. c) Fresh Water Supply, Sewage, and Wastewater Management Plan: Update to include the new Mine Site stations added to the SNP based on Modification No. 13, and the water withdrawal volumes to indicate the proposed volumes under the Updated Amendment Application. Note - recommendations R-16d and R-16e are minor suggestions for editorial purposes and would not impede approval of the amendment: d) Draft Emergency Response Plan and Draft Spill Contingency Plan: For consistency with other plans that have been updated, BIMC might consider reorganizing in the next update to conform with ISO 14001:2015, and to include sections on IQ consideration and adaptive management. e) Waste Management Plan: for clarity, BIMC might consider updating to remove references to the Roads Management Plan.	AEMP - The AEMP is currently available on the public registry. Blasting Management Plan - Procedures for blasting of frozen ground will be added to the next update. Baffinland suggests that the management of spoils is best handled in the Borrow Pit and Quarry Management Plan. Fresh Water Supply, Sewage and Wastewater Management Plan - this plan will be updated incorporating changes to the SNP program and proposed water withdrawal volumes. Draft Emergency Response Plan and Draft Spill Contingency Plan - Baffinland suggests that as response plans, they do not lend themselves to adopting CIRNAC's recommended changes. Waste Management Plan - the editorial issues are noted and will be addressed in the next revision. **Commitment**: The above plan updates will be filed with sufficient review time ahead of the NWB public hearing.	

CIRNAC WRMP R-01					CIRNAC recommends that BIMC revise Section 9.2 to reflect the actual site water management issues with regard to the WRF [Waste Rock Facility] and how BIMC now plans to address and manage them, as outlined below: I. clearly state that water treatment as needed will be through the use of the HDS [High Density Sludge] plant; II. provide information on the design, operation, control and monitoring of the pumping systems to the water treatment plant; III. provide a detailed discussion with specific, relevant information with respect water treatment plant design, operations and monitoring, as appropriate; IV. expand the discussion of sludge management to provide more specific information on practices to be followed; and V. add the commitment that in the event of in-pond water treatment, BIMC will complete the evaluation and record keeping required to ensure there is no long-term impact on pond capacity, as outlined in CIRNAC comment 1 i. an estimate of volume of sediment to be produced; ii. an assessment of the need for standby pond capacity; iii. details regarding the procedures for sediment handling, transport, and disposal; and iv. monitoring and sediment disposal record keeping practices.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	
CIRNAC WRMP R-02					CIRNAC recommends that BIMC update and calibrate the water balance model for the Waste Rock Facility, as per the recommendations provided by Golder (2019), with reliable measurements of pond water elevation, surface water flows, and site climate data. Predictions of pond water quality should also be updated using the improved surface water flows.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	
CIRNAC WRMP R-03					CIRNAC recommends that BIMC provide CIRNAC with an update of progress made to date and a specific timeline for when the earliest update to the water balance model could be expected.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	

CIRNAC ICRP R-01				Commitment	Waste Rock Pile and Open Pit closure costs be calculated directly by BIMC and be included in the next updated ICRP.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Baffinland agrees that opportunities for reduction in contingency may be possible in future iterations of the reclamation estimate. Due to the outcome of the 2019 Work Plan arbitration, Baffinland has carried 20% contingency to align with the final award. Baffinland notes that the estimate currently accounts for the uncertainty at the waste rock facility through the addition of water treatment in closure. Additionally, while uncertainty may exist regarding predictions associated with the open pit, and open pit does not exist at the Mary River Project as mining at Deposit 1 remains a hilltop outcrop.	
CIRNAC ICRP R-02				Commitment	Update the ICRP according to the updated Waste Rock Management Plan approved by the NWB.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Baffinland agrees that future updates to the ICRP should respect any updates to the Waste Rock Management Plan (WRMP). The current WRMP maintains a final closure strategy of freezing waste rock in permafrost to mitigate the generation of ARD and has revised the waste placement strategy accordingly with the objective of freezing material in place to mitigate ARD. Baffinland has integrated adaptive management into the WRMP to further demonstrate a commitment to ensuring the final closure objectives are met.	
CIRNAC ICRP R-03				Ongoing	Increase interim care and maintenance to 5 years, and post-closure cost to 25 years.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Future iterations of the ICRP will evaluate the need for increased Closure and Post Closure Monitoring. Baffinland maintains that the duration of closure activities (3 years) is adequate given the total person-hours required to execute the closure and assumed crew sizes, and that the post closure monitoring phase is sufficient given that there are no significant adverse residual effects identified in the FEIS for VECs or VSECs associated with the Project.	

CIRNAC ICRP R-04				Commitment	Update a WRF cover layer in the ICRP and include Prevention of Fugitive dust in the cost estimate.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Dust impacts were considered in the FEIS for the life of mine, including closure, and no significant adverse residual effects were identified for dust. It is noted that the primary sources of dust (ore crushing, ore stockpiling, and ore transport) will no longer be in operation at closure, and therefore negligible contribution to air quality. Air quality monitoring is included as a Post Closure Monitoring activity in the ICRP and is included in the reclamation security estimate. Baffinland will gain better understanding of revegetation success relative to cover material through future reclamation research studies.	
CIRNAC ICRP R-05				Commitment	Update Long term criteria for permafrost conditions in the ICRP and include in the cost estimate.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: The ICRP is an iterative document that will evolve throughout the life of mine, based on reclamation research studies, results of on-going monitoring, development of new/novel mitigation measures and feedback from Inuit and intervenors. No additional adjustments to reclamation security are required at this time based on the currently understanding of the project effects and desired reclamation objectives.	
CIRNAC ICRP R-06				Commitment	Include cost for studies and instrumentation at the end of mine operations. The currently approved ICRP is dated 2018 and should be updated with additional equipment needed for geotechnical / thermal engineering monitoring.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Costs for monitoring, including any required instrumentation, are included in the Closure & Post Closure Monitoring costs. Details of the monitoring programs included in this allocation are outlined in Section 9 of the ICRP (Rev. 5, Oct 2018). Geotechnical engineering monitoring is outlined in Section 9.4 of the ICRP, which includes stability, erosion and permafrost analyses and monitoring.	

FISHERIES AND OCEANS CANADA

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DFO-3.1.1	Various	DFO-FFHPP recommends Baffinland provide rationale for the selection of crossing infrastructure for fish bearing watercourses. DFO-FFHPP notes this can be provided to DFO as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As follow-up to the June 2019 NIRB technical meetings, Baffinland issued a July 2, 2019 memo by Knight Piésold (*Additional Information on Fish Habitat Interactions*), provided as Attachment 03 to this response. This memo is not listed in the referenced DFO documents. The document provides supplemental fisheries information, including a discussion regarding the basis of selecting crossing types in Section 5.	Unknown		**Update**: A final deliverable documenting the crossing design selection process will be included in the Application for Fisheries Act Authorization	
DFO-3.1.2	Various	DFO-FFHPP reiterates the recommendation that Baffinland provide the full scope and visual of catchment areas associated with fish-bearing water crossings.	Catchments of fish-bearing crossings along the Tote Road and proposed North Railway are shown on Figures 1 and 2 of Attachment 03 (*Additional Information on Fish Habitat Interactions*).	Unknown		**Update**: Fish-bearing status is shown on the detailed railway figures (Attachment 10 of the Updated Application). These figures have been updated to reflect to change to Route 3.	
DFO-3.1.3	Various	DFO-FFHPP recommends the Proponent provides maps for the entirety of the road and label all crossings, which includes the locations of proposed changes to existing Tote Road crossings (as currently provided) and the locations for crossings that are expected to remain as they are.	An updated version of the detailed railway figures that appeared as Attachment 10 of the May 2019 water licence amendment application appear as Figures 4 to 36 of the July 2, 2019 memo provided as Attachment 03 to this response (*Additional Information on Fish Habitat Interactions*). This updated version shows the entirety of the Tote Road including water crossing labels and proposed changes.	Unknown		**Update**: Relevant updates have been made to the detailed railway figures (Attachment 10 of the Updated Application), including Route 3.	
DFO-3.2.1	Various	DFO-FFHPP recommends that Baffinland clarify when they will provide updated hydrological modelling.	Updated hydrological modelling is presented in a June 18, 2019 memo by Knight Piésold provided as Attachment 04 (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions)*. Baffinland is undertaking an engineering review of crossings assessed by KP to be high risk of being a barrier to fish passage, and the outline of a fish passage monitoring program is provided as Attachment 05 (*Proposed North Railway Aquatic Monitoring Programs*).	Unknown		**Update**: A final fish passage risk assessment will be provided with the future FAA Application	
DFO-3.2.2	Various	DFO-FFHPP recommends that Baffinland provide the flow volumes referenced as section 7.1.5.3 on page 23, in section 7.2.1.5 of attachment 7.2 of the updated application: North Railway Design Criteria, or provide the appropriate reference.	Section 7.1.2.5 of the Rail Design Criteria document (Attachment 7.2 of the Updated Water Licence Amendment Application) includes an incorrect reference: "The flow volumes calculated in 7.1.5.3 will be used to determine the ultimate sizing of the culvert structure in terms of number and size of	Unknown		**Update**: A final fish passage risk assessment will be provided with the future FAA Application	

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			barrels." DFO is correct that there is no Section 7.1.5.3, and flows are not presented elsewhere in the same document. Catchment areas and mean monthly flows for July and August are presented for fish-bearing crossings in the updated fish passage assessment presented as Attachment 04 (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions).*				
DFO-3.2.3	Various	DFO-FFHPP recommends Baffinland clarify which flood return period is intended for use for the hydrologic analysis.	The design return period is the 1:200-year flood, and the reference to the 1:100-year flood in Section 7.2.3 is incorrect.	Unknown		No update required.	
DFO-3.2.4	Various	DFO-FFHPP recommends Baffinland provide further information in regard to the potential cumulative impacts of all crossings on flow and fish passage (short-term and permanent; Tote Road, North Rail and Temporary Access Roads), including clear identification of crossings that occur on the same waterbody.	North/South Consultants Inc. conservatively assumed in Attachment 13.1 of the Application that rail crossings that are located <20 m from an existing Tote Road culvert are locations where two culverts in proximity could be a potential barrier to fish passage. Within Attachment 04 of this response (*Additional Information on Fish Habitat Interaction*s), these locations are identified in Table 1 and are shown on the detailed railway figures (Figures 4 to 36).	Unknown		**Update**: A final fish passage risk assessment will be provided with the FAA Application.	
DFO-3.2.5	Various	DFO-FFHPP recommends the Proponent clarify the intent of the statement: *"mitigation measures, specific to bridges along the rail corridor, will be applied if flow velocities are found to restrict fish passage"*, and respond with clarification why the proposed bridges will not incorporate appropriate fish passages in the initial design	The aquatic considerations cited in Section 8.6 of Attachment 13.7 of the Application are adopted from a generic list of mitigation measures for water crossings. Preliminary bridge drawings are presented in Attachment 13.8. of the Application. The final bridge designs included with the application for a *Fisheries Act* authorization will maintain fish passage.	Unknown		**Update**: The Bridge Hydraulics Report (Attachment 13.7 of the Updated Application) and Rail Bridge Drawings (Attachment 13.8 of the Updated Application) have been updated to reflect the change in the location of Bridge #3 on the Ravn River associated with Route 3.	
DFO-3.3.1	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 And other documents	DFO-FFHPP recommends Baffinland provide a detailed water withdrawal plan, which can be provided to DFO as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	At the second NIRB technical meeting in June 2019, Baffinland committed to providing more details on fish habitat features and potential effects to littoral areas at proposed water withdrawal locations (DFO technical review comment 3.12.2 in NIRB review process). A detailed water withdrawal plan will be provided that includes fish habitat information and that considers the DFO's 2013 Environmental Flow Requirements guideline as part of Baffinland's Request for Review and/or Application for a *Fisheries Act* authorization. .	Unknown		**Update**: The Detailed Water Withdrawal Plan has been provided as Attachment 16 of the updated Application.	

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DFO-3.3.2	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan, attachment 23 of the Updated Application for Amendment No. 2 of Type A Water Licence, Document #: BAF-PH1-830-P16-0010. Section 4.2, pg. 18.	Recommendation 3.3.2: DFO-FFHPP recommends Baffinland clarify what site-specific conditions would indicate, that a greater water withdrawal than 10% in proposed withdrawal lake sites, would not be significant in the context of fish bearing habitat.	The referenced text from page 18 of the FWSSWMP stated as follows, "*Monthly cumulative withdrawals from lakes represent less than 10% of the monthly outflow, unless site-specific conditions indicate that a greater water withdrawal will not be significant in the context of fish bearing habitat (i.e., Camp Lake)*." This is in reference to circumstances such as described in the 2014 water take assessment, (July 16, 2014 letter report by Knight Piésold, *Hydrology Assessment of Water Sources for Dust Suppression along the Tote Road - Mary River Project - Early Revenue Phase;* Ref. No. NB19-00376): *"Each of the identified lakes will meet the threshold of 10% reduction of outflow under all flow conditions including 10-year return period low flow conditions that can be experienced during the month of September. The only exception to this is Camp Lake, which meets the 10% reduction of outflow threshold under mean flow conditions but not under low flow conditions. Under the 10-year low flow condition, however, a reduction of up to 27% of lake outflows could occur (Table 4), warranting further evaluation and consideration of potential effects to fish and fish habitat.* *While the proposed water withdrawal in Camp Lake will exceed the 10% lake outflow reduction threshold under the 10-year low flow condition, there are site-specific conditions to be considered. The outflow stream of Camp Lake reports to Mary Lake. The stream is broad and shallow and has been observed on multiple occasions (and various flow conditions) to lack connectivity. The proposed water withdrawal can be expected to increase the frequency at which natural lack of connectivity occurs between the two lakes. Limited movement of adult Arctic Char occurs through this stream, and consequently, this stream was not identified as critical fish habitat (North/South Consultants Inc., 2012). As such, a reduction in flow of 27% of the 10-year low flow is not expected to cause fish stranding or meaningful effects to fish or fish habitat (North/South, 2014)."*	Unknown		**Update**: The Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application) applied a withdrawal threshold of 10% of the monthly flow. The previous estimate that withdrawals from Camp Lake would represent 27% of the 10-year low flow. This previous estimate was based on the 10-year low flow of the lowest flow month (September), which is unnecessarily constraining. In the Detailed Water Withdrawal Plan, the 10-year annual low flow threshold was applied as a more appropriate threshold that is sufficiently conservative. The proposed water withdrawal volumes will be less than the revised threshold of 10% of the 10-year annual low flow volume in Camp Lake.	

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DFO-3.3.3	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan, attachment 23	Recommendation 3.3.3: DFO-FFHPP recommends Baffinland conduct a thorough localized assessments on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment should include, but not be limited to, an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be environmentally protective threshold. DFO-FFHPP notes this information can be provided as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As per Baffinland's response to DFO 3.3.1, a detailed water withdrawal plan will be provided in advance of the NWB technical meeting.	Unknown		**Update**: As per Baffinland's August 2019 commitment, a Detailed Water Withdrawal Plan was included in the updated Water Licence Amendment Application (Attachment 16).	
DFO-3.3.4	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan	DFO-FFHPP further recommends Baffinland provide additional rational/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies. DFO-FFHPP notes this information can be provided as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As per Baffinland's response to DFO 3.3.1, a detailed water withdrawal plan will be provided in advance of the NWB technical meeting.	Unknown		**Update**: Revised thresholds have been applied in the Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application). The revised thresholds are based on DFO's published guidance.	

DFO-3.4.1	Updated Application for Amendment No. 2 of Type A Water Licence, attachment 27: Aquatic Effects Monitoring Plan, Document #: BAF-PH1-830-P16-0039. Section 2.4.4, pg. 37.	DFO-FFHPP recommends that Baffinland revise their instantaneous pressure threshold limit of 100 kPa to 50 kPa when calculating setback distances and update their conclusions as necessary.	Baffinland will adopt the lower threshold of 50 kPa as a precautionary measure. Applicable draft management plans for Phase 2 will be revised accordingly when next updated in advance of the NWB technical meeting.	Unknown		**Update**: the 50 kPa threshold has been reflected in the applicable management plans, including the Surface Water and Aquatic Ecosystem Management Plan (SWAEMP; Attachment 22 of the Updated Application), Blasting Management Plan (Attachment 27) and the Environmental Protection Plan (EPP; Attachment 29).	

ENVIRONMENT AND CLIMATE CHANGE CANADA

ID#	Document Reference	July 2019 Recommendations/Requests	Baffinland's August 2019 Response	Intervenor's October 2021 Status Update	Intervenor's October 2021 Recommendations/Requests	Baffinland's November 2021 Response	Attachment
ECCC 3.1	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 1): Fresh Water Supply, Sewage, and Wastewater Management Plan, Section 5.4.1 and Appendix F: Polishing Waste Stabilization Ponds (PWSP) Effluent Discharge Plan. Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 18.2: Milne Port Water and Sewage Schematic	Clarify whether there would also be a treatment system for the Polishing Waste Stabilization Ponds (PWSP) at Milne Port (similar to what is at the Mine Site), and, if so, provide details on the system. Update the PWSP Effluent Discharge Plan (Appendix F).	The Port Site PWSP has a treatment system that is used to treat the contents of the PWSP to meet the applicable discharge requirements, before being discharged to Milne Inlet. As at the Mine Site PWSPs, a portion of the treatment occurs naturally, through the growth of algae through the summer season. The treatment system consists of a dissolved air floatation unit (DAF), housed inside an insulated and heated seacan, with an air injection system, sludge removal system, coagulant dosing, and flocculant dosing. There is also provision in the system for acid or caustic dosing, if required for pH adjustment. During the summer season, algae grow in the PWSP, consuming any remaining nutrients in the off-spec water, leaving behind TSS in the form of algae solids. The DAF system uses a saturated air-water mixture, injected into the influent stream, to remove solids through floatation. The influent stream is first dosed with a coagulant and flocculant, to promote the formation of large floc solids. These solids nucleate around the microscopic air bubbles formed by the saturated air-water mixture and rise to the surface of the main tank. The "float" sludge is then skimmed from the surface of the tank and pumped to totes for disposal. Clarified effluent overflows from the system into a break tank, which is then pumped to Milne Inlet if it meets the discharge criteria. The PWSP Effluent Discharge Plan is being updated as part of ongoing operations. The updated plan will be included in the next revision of Baffinland's Fresh Water Supply, Sewage, and Wastewater Management Plan.	Resolved			

ECCC 3.2	May 2019. Updated Application Attachment 22: Surface Water, Aquatic Ecosystem Management Plan, Sections 10.2.3.1 and 10.2.3.2.	ECCC recommends that the Proponent provide a detailed description of proposed construction monitoring for the Phase 2 activities.	A detailed outline of construction monitoring is provided as Attachment 05 (*Proposed North Railway Aquatic Monitoring Programs*).	Resolved			
ECCC 3.3	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 1): Fresh Water Supply, Sewage, and Wastewater Management Plan, Section 7.1, Table 7-2, and Appendix J: Waste Pond Water Treatment Plant Operations – Appendix A. Government of Canada. June 2019. Metal and Diamond Mining Effluent Regulations	ECCC recommends that the Proponent: Update references from the MMER to MDMER. Provide clarification on the discharge criteria that will be applicable.	The need to update discharge criteria and references to the MDMER is acknowledged (Sections 7.1 and 7.2 including Table 7-2; Appendix A of Appendix J; Appendix H). These changes will be completed in the next update to the Fresh Water Supply, Sewage, and Wastewater Management Plan, to be submitted in advance of the NWB technical meetings.	Resolved			
ECCC 3.4	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal - Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 5): Fresh Water Supply, Sewage, and Wastewater Management Plan.	ECCC recommends that the Proponent clarify pdf pages 52 to 57.	Baffinland appreciates ECCC's thorough review of the Fresh Water Supply, Sewage, and Wastewater Management Plan. Pages 52-58 of Attachment 23 FSWWP (Part 5) have been reviewed and the following clarifications are provided: Page 52: This figure is the final page of Appendix F. It is noted that this figure is upside down in the PDF. Page 53: This is the flysheet for Appendix G - Mobile Oily Water Separator (OWS) Manual. Appendix G has been added to the FWSSWMP - Part 5 file that was included in the Application, provided as Attachment 06 to this response. Page 54: This is the flysheet for Appendix H - MDMER Sampling and Reporting Requirements Memo (Minnow). This Appendix can be found in pages 59-67 of the PDF.	Resolved			

			Pages 55-56: These pages were erroneously included and have been removed from the FWSSWMP - Part 5 file provided as Attachment 06 of this submission. Pages 57-58: These pages are appendices to Appendix G of the FWSSWMP; see Attachment 06 of this submission. All required changes will be made in the next update to the FWSSWMP which will be submitted prior to the technical meeting.				
ECCC 3.2.1	Surface Water and Aquatic Ecosystems Plan Table 5.2 Construction Activities; Site operations including stockpiling snow; Quarry and Borrow Pit Operation; and Landfill Operations			New	ECCC recommends that the Proponent: - Add text in the Low-Risk column that identifies the condition status of elevated concentrations/approaching criteria as a trigger for action. - Clarify that thresholds are triggered by exceedance of any one or more of the regulated parameters.	Baffinland will amend the low-risk condition in the TARP to note any trends in increasing concentrations of regulated parameters, and an exceedance of any discharge limit will trigger action. This will be filed in the next update of the SWAEMP provided ahead of the NWB public hearing.	
ECCC 3.2.2	Surface Water and Aquatic Ecosystems Plan Table 5.2 Water crossing installations and/or modifications row.			New	ECCC recommends that the Proponent: - Clarify the purpose for TDS as a performance indicator - Add Oil and Grease as a performance indicator; and - Clarify how comparisons to background will be evaluated.	Total Dissolved Solids (TDS) is a supporting parameter in the Northern Corridor Monitoring Program to assist with interpretation of other monitoring results, including total and dissolved metals. Sedimentation is the primary concern with respect to monitoring during water crossing installations and modifications. Hence, Baffinland suggests monitoring for evidence of sheen is adequate and testing for oil & grease is not required. The Water crossing monitoring guidelines specify sampling before, during and following the work, both up- and downstream the crossing. Baffinland uses the weight of evidence of both pre-work and upstream monitoring in comparisons against background.	
ECCC 3.2.3	Surface Water and Aquatic Ecosystems Plan Table 5.2 Road operation row.			New	ECCC recommends that the Proponent: - Clarify the performance indicator for metals as “total and dissolved metals”.	The Northern Corridor Monitoring Program includes the analysis of total and dissolved metals. The word "and" was omitted in the TARP, but Table H.2 in Appendix H correctly states "total and dissolved metals" as monitoring parameters.	

ECCC 3.2.4	Surface Water and Aquatic Ecosystems Plan Section 5.6; Table 5.2 Trigger Action Response Plans (TARP); Figure 5.1 Northern Corridor Monitoring Adaptive Management Framework; Appendix H Northern Corridor Monitoring Program			New	ECCC recommends that the Proponent: - Includes a Low-Risk Threshold in the Northern Corridor Monitoring Program and clarifies whether it is entirely post-construction. - Clarify the comparisons to upstream in Section 5 for TSS Action Thresholds.	A low-risk threshold has been established in the Northern Corridor Monitoring Program. This has been presented in the TARP (Table 5.2) in the SWAEMP. The Northern Corridor Monitoring Program presented in Appendix H, however, does not currently incorporate the low-risk threshold. Appendix H will be amended to incorporate the low-risk threshold presented in the TARP. This includes amending the last sentence of Section 5.6 of the SWAEMP to refer to Section 5 (not Section 6) of Appendix H.	
ECCC 3.2.5	Fresh Water Supply, Sewage, and Wastewater Management Plan; Tables 3.7 and 5.2			New	ECCC recommends the Proponent: - Ensures that all plans that make reference to the requirements of the MDMER be updated in accordance with the amended Regulations.	ECCC's comments about all parts of the MDMER coming into force are noted. Table 3.7 in the next revision of the FWSSWMP will reflect the fact that parts of the latest regulation came into force on June 1, 2021 (for example, the addition of un-ionized ammonia to Schedule 4 of the regulations).	
ECCC 3.2.6	Fresh Water Supply, Sewage, and Wastewater Management Plan; Section 3.5; Table 3.8; Appendix D			New	ECCC recommends the Proponent: - Clarify water management planning at Milne Inlet, addressing the four points - No information is provided in the text on the management of Lump Ore Stockpile Perimeter ditching contact water. Based on diagrams provided in Appendix D, it appears that this water will be trucked to a final discharge point; however, this should be confirmed within the text. - There is an inconsistent use of terminology, as the section refers to stormwater ponds #1 and #2, which are not listed in Table 3.8. It is assumed that the Proponent may be referring to Stockpile Sedimentation Ponds East and West, but this is not clear. - There is no information provided on how water will be managed from one location to another at Milne Port. If all waters are to be discharged through the existing final discharge points, information should be provided as to how the water will be transferred to these locations. Based on the diagrams in Appendix D it appears that the Proponent will utilize a combination of trucking and portable pumps, however this information should be explicitly described within the plan. - It is stated that all stormwaters are to be discharged through the existing final discharge points. There is no discussion	1. Contact water from the lump ore stockpile perimeter pond will be either trucked or pumped to the East or West Ponds. Alternatively, the water will be discharged at one of the existing final discharge points by bypassing the east/west ponds. 2. ECCC is correct that the Water Licence identifies the Milne Port stormwater ponds as the East and West Ponds. These have been renumbered for clarity given other new ponds are proposed. 3. As noted in the response to item #1, contact water will either by trucked or pumped. 4. As noted in the responses above, both trucking and piping are being considered. The existing final discharge points may be utilized bypassing the East and West Ponds. Baffinland will update the Fresh Water, Sewage and Wastewater Management Plan specifying final plans in terms of conveyance and discharge of contact water at Milne Port.	

					provided on the capacity of the existing ponds to accommodate additional volumes being transferred from the new ponds and held prior to discharge.		
ECCC 3.2.7	Aquatic Effects Monitoring Program; Table 3.1 & 3.2; Section 3.1.1.1 - Water Quality Benchmarks			New	ECCC recommends that the Proponent: - Review recent research and guidelines, including for those parameters listed above, and determine the applicability of more recent guidelines to the Project. The benchmarks for the AEMP analysis should be updated accordingly.	Baffinland has reviewed the recent guidelines indicated by ECCC and will adopt those for cobalt, (dissolved) lead, strontium, and zinc as AEMP benchmarks. The AEMP benchmarks for these parameters will be derived using baseline data (when available) to conform to the same methods used to derive AEMP benchmarks for other parameters. During the development of the AEMP benchmark for copper, the use of 97.5th percentile of copper concentration at the time of baseline for the waterbody of interest was selected as the benchmark because concentrations of copper were naturally elevated above applicable Water Quality Guidelines WQG at these waterbodies. Hence, Baffinland could not be expected to achieve the WQG for copper at these waterbodies. Therefore, the rationale for the AEMP benchmark was that if the 97.5th percentile of baseline concentration was exceeded following commencement of commercial mine production, this may be an indication of mine-related influence on the waterbody of interest. Accordingly, Baffinland does not feel that a change to the existing AEMP benchmark for copper is warranted based on the same rationale provided herein.	
ECCC 3.2.8	Aquatic Effects Monitoring Plan - Section 5.1 & Table 5.1			New	ECCC recommends the Proponent: - Provide additional details on the specific requirements to trigger the action levels - Identify triggers that increase the protectiveness of the proposed moderate action level.	Baffinland is in the process of considering additional details for triggers related to action levels proposed in the existing Data Assessment and Response Framework (Section 5.1, Table 5.1) for the water quality study component.	

ECCC 3.2.9	Attachment 32 - Phase 1 Waste Rock Management Plan - BAF-PH1-830-P16-0029' Phase 2 Proposal Revisions. For Review Purposes Only Rev B; Golder Report - Waste Rock Management Plan - For 2020 through 2021; Section: 10.3 Waste Rock Facility (WRF) Closure			New	Statement: ECCC notes that once a mine is subject to MDMER, it remains subject to MDMER until it acquires the recognized closed mine (RCM) status, and as such, all effluent discharges will have to be discharged through a designated final discharge point (FDP) monitored and reported through Mine Effluent Reporting System (MERS).	ECCC's comment is acknowledged, and Baffinland will adhere to the regulations.	

QIKIQTANI INUIT ASSOCIATION

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QIA-1.1	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP	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.	Baffinland will continue to engage QIA on the updates to the ICRP, to meet the conditions of both the Commercial Lease and the Type 'A' Water Licence.	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.	Baffinland is committed to working with QIA to reach agreement on the ICRP prior to the Public Hearing on the Phase 2 Proposal Water Licence Amendment, as described in the Inuit Certainty Agreement. Changes to the ICRP made through the NWB process will be subject to QIA review and approval.	
QIA-2.1	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP	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.	Baffinland will continue to engage QIA on the updates to security held for the Project, to meet the conditions of both the Commercial Lease and the Type 'A' Water Licence.	Resolved	QIA is satisfied with Baffinland's August 23, 2019 response.		
QIA-3.1	190502-2AM-MRY1325-Amend2-Applic-Att-2-Applic	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.	Baffinland believes that an amended Water Compensation Agreement is required and has provided QIA with draft revisions to the Water Compensation Agreement to reflect the Phase 2 Project.	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.	Baffinland is committed to working with QIA to draft a new Water Compensation Agreement, with the goal of having a signed Water Compensation Agreement prior to the Public Hearing on the Phase 2 Proposal Water Licence Amendment.	
QIA-4.1	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	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.	The proposed alignment of the North Railway follows the existing Milne Inlet Tote Road for the majority of the distance between the Mine Site and Milne Port, which limits the footprint of the Project and the need for additional access road construction. The section of the North Railway alignment that deviates from the Milne Inlet Tote Road was subject to an exhaustive technical feasibility study, which determined the preferred alignment was the most technically and economically feasible, as well as the safest in terms of operations (grade and distance from water) and Inuit and wildlife crossings (least steep cuts). Based on these considerations Baffinland advanced the preferred alignment for public reviews to be administered by the Nunavut Planning Commission (NPC), Nunavut Impact Review Board (NIRB), and the Nunavut Water Board (NWB). The proposed alignment of the North Railway, as with the Tote Road, does overlap with a	Deferred	This Technical Comment is now addressed by TC 26-33.	n/a	

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			primary travel route. The proposed railway deviation does additionally overlap with the travel route to Igloolik. No other important values were identified in the IQ work that resulted in the map book presented as TSD 5. The proposed alignment of the North Railway occurs entirely within the Mary River Transportation Corridor as defined in Appendix P of the North Baffin Regional Land Use Plan. The modification (Modification No. 3) to this Corridor was subject to a thorough public review process, facilitated by the NPC, and culminated in a Public Hearing in Pond Inlet in December 2017. Issues with the proposed North Railway alignment raised by Inuit through this process were used by Baffinland to identify gaps in existing IQ collection and modify its Phase 2 engagement planning in relation to the NIRB Project Certificate Reconsideration. The primary addition was a series of Community Risk Assessment Workshops, which were intended to identify and integrate Inuit generated mitigations and monitoring measures into Baffinland's environmental management plans relating to the North Railway. The location of special built crossings to facilitate travel by Inuit and caribou across the North Railway was the subject of a Crossing Selection Workshop, held July 29-August 2, 2019, at the Mary River Mine Site. At the Workshop Inuit from the communities of Pond Inlet and Igloolik were asked to identify areas along the proposed North Railway alignment that intersect known travel routes between the two communities or from their communities to known hunting grounds. The results of this Workshop will be provided in a report to the NIRB and NWB before the Public Hearings. The relevant operational (Snow Management Plan and Railway Operations and Maintenance Plan) and environmental (Terrestrial Environment Monitoring and Mitigation Plan) management plans will be updated based on IQ collected through a series of Community Risk Assessment Workshops (January - May 2019) as				

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			well as a Crossing Selection Workshop (July 2019). Reports from these two workshops will be provided to the NIRB and NWB before the Public Hearings. Should the North Railway be approved and constructed, the applicable environmental management plans will be subject to the newly developed Adaptive Management Plan and IQ Collection Framework, which will systematically collect and integrate Inuit input and IQ into Baffinland's decision making processes. Further details on this process will be released prior to the Technical Meetings for review and discussion.				
QIA-4.2	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	Provide monitoring locations along the proposed North Railway that align with Inuit use.	Road and rail dust are not expected to affect the quality of water in nearby streams and lakes in regard to a potential source of drinking water. Baffinland's IQ study did not identify waters important to Inuit in the vicinity of the Tote Road and Railway (KP Letter dated November 30, 2018; Ref. No. NB18-00785; Appendix A of Attachment 2 of Baffinland's January 2019 response to NIRB advanced technical review comment HC 02 in January 2019). It was acknowledged in that report that it is reasonable to assume that watercourses close to areas used by Inuit may be used as sources of drinking water, including Phillips Creek and the lakes within the Phillips Creek catchment. On June 14, 2019, Baffinland received a copy of the QIA's Tusaqtavut Study for Pond Inlet, which identified approximately 14 values within the Project areas that are used for subsistence (either fishing and/or fresh water) within the Project footprint including a 250 m buffer. Baffinland requests the coordinates and interviewer-assigned description of each value, so that the nature of these subsistence values can be understood. 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.	Deferred	This Technical Comment is now addressed by TC 26-33.	n/a	

QIA-5.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838)	When will the monitoring and adaptive management plan related to flow diversion be shared for review and comment?	Monitoring and adaptive management at stream diversions are outlined in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.	The nature of this issue is such that adaptive management will be subject to review by a trained professional, and concrete thresholds and pre-defined responses cannot be developed. Section 5.9 of the SWAEMP states: The triggers for taking action 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.	
QIA-6.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	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.	Section 5.2 of the Railway Operation and Maintenance Plan (under the heading Component Inspections) describes the inspections and maintenance work to be undertaken at bridges and culverts. Section 1.3 identifies the relevant management plans for issues related to water quality and fish habitat, notably the EPP and the SWAEMP. These plans will be relied upon for addressing water quality and fish habitat issues that are identified as part of the Component Inspections of bridges and culverts.	Unresolved	This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.	The Railway Operation and Maintenance Plan was created in the environmental assessment led by the Nunavut Impact Review Board and is not part of the Water Licence Application. As noted in Baffinland's original response, water quality issues during construction will be managed by applying the Environmental Guidelines for Water Crossing Repairs, Modifications and/or Installations (Appendix F of the Surface Water and Aquatic Ecosystems Management Plan [SWAEMP]), with monitoring and adaptive management described in the trigger action response plan (TARP) presented in the SWAEMP. Similarly, ongoing water quality monitoring during rail operations is covered by the Northern Corridor Monitoring Program (SWAEMP Appendix H), adapted from the Tote Road Monitoring Program to account for rail monitoring. Both these monitoring programs were developed jointly with the QIA.	
QIA-7.1	Multiple, for example: 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	Baffinland proposes to update the Water Licence related management plans in advance of the NWB Technical Meetings. Attachment 07 presents a table that identifies where each management plan references another plan. The references to other plans will be checked and updated the next update to these management plans.	Unresolved	QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.	The management plans presented in the updated Water Licence Application have had varying levels of review by the QIA. Baffinland continues to implement its work plan to update the management plans as agreed to with the QIA.	

QIA-8.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	A detailed outline of rail monitoring is provided as Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This concern remains outstanding until thresholds are developed for Fish Passage.	Fish passage will be relevant to the Fisheries Act Authorization (FAA) Application that will follow the water licensing process. Baffinland has initiated discussions with DFO regarding fish passage through the FAA process.	
QIA-9.1	Multiple, including: 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	Baffinland proposes to update the Water Licence related management plans in advance of the NWB Technical Meetings. Attachment 08 presents a table that identifies where each management plan forward-references an action and provides more detail or clarification on each of these commitments. These forward-referenced commitments will be addressed according to the proposed actions in the next update to these management plans in advance of the NWB technical meetings.	Unresolved	QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.	The management plans presented in the updated Water Licence Application have had varying levels of review by the QIA. Baffinland continues to implement its work plan to update the management plans as agreed to with the QIA.	
QIA-10.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	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.	As noted in the Roads Management Plan, calcium chloride is mixed with water for application to roads for dust suppression in accordance with its Dust Management Protocol, which is Attachment 6 of the Air Quality and Noise Abatement Management Plan, presented as Attachment 09 of this response. The Dust Management Protocol is consistent with Section 2.3 of the Nunavut Environmental Guideline for Dust Suppression (Government of Nunavut, 2002). This includes using dust suppressants approved by the GN (CaCl is an approved dust suppressant); following manufacturer application instructions; applying the dust suppressant to the roadway; monitoring the application rate to ensure adequate coverage without pooling or runoff of product; not using more dust suppressant than needed to effectively suppress dust; and ensuring the material does not migrate or run off the traveled portion of the roadway. Monitoring to determine if calcium chloride can be detected in local watercourses is not identified in the GN dust suppression guideline. Baffinland notes that in 2018 an alternate dust suppressant called Dust Stop was used on a trial basis, and an expanded trial application is being implemented in 2019. Dust Stop is non-toxic to aquatic life and is being considered to partially or fully replace the use of CaCl as a dust suppressant at site.	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.		
QIA-10.2		Provide the applicable guideline used to minimize runoff into local watercourses.	The Dust Management Protocol presented as Attachment 6 of the Air Quality and Noise	Resolved	QIA is satisfied by the response provided by Baffinland on August 23, 2019.		

			Abatement Management Plan provides the guidance Baffinland staff use to minimize runoff into watercourses. The Dust Management Protocol has been provided as Attachment 09 to this response.				
QIA-11.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland to monitor the construction, operations and closure of the North Railway.	Part D, Item 18 of the existing Water Licence requires geotechnical inspections of earthworks. Schedule B, Item 1e.ii of the existing Water Licence requires reporting of results of thermal modelling and/or research carried out in relation to permafrost integrity along the railway alignment.	Unresolved	This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway.	As noted in Baffinland's original response, the Water Licence contemplates the construction and operation of a railway (the South Railway) already, and further conditions are not required. Attachment 8.15 of the Updated Application is the North Railway Instrumentation Monitoring Program. Section 5.3 identifies alert levels (thresholds) for changes in ground temperature and settlement in the embankment, as well as response procedures and actions. Baffinland will develop a TARP based on this monitoring plan, to be presented in the appropriate management plan. As previously stated, this will be completed during the first year of rail operation. The commitment to develop a TARP applying the geotechnical criteria in the railway monitoring program should be sufficient to resolve this recommendation.	
QIA-11.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland to provide the monitoring program prior to any construction approvals for the North Railway is provided.	Baffinland will provide details on the construction geotechnical monitoring program as part of the Water Licence review process in advance of the technical meeting. The outcome of the construction geotechnical monitoring program will inform the operations phase geotechnical monitoring, to be incorporated into the updated Railway Operation and Maintenance Plan.	Unresolved	This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence.	The previously forward-referenced construction geotechnical monitoring program was presented as Attachment 8.15 of the Updated Application. Part D, Item 18 of the Water Licence requires annual geotechnical inspections. As per the response to QIA-11.1, the geotechnical monitoring program including thresholds will be presented in a management plan that will be approved under the Water Licence.	
QIA-12.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	These records should be provided to reviewers as part of Baffinland's reporting requirements under the Water Licence.	Part D, Item 18 of the existing Water Licence requires geotechnical inspections of earthworks. Schedule B, Item 1e.ii of the existing Water Licence requires reporting of results of thermal modelling and/or research carried out in relation to permafrost integrity along the railway alignment.	Unresolved	This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence.	The QIA's recommendation was in relation to the following: "Records of inspections and corrective actions will be kept by the Railroad Infrastructure Department." This statement refers to standard internal record-keeping. Baffinland's initial response governs how external reporting will be conducted.	
QIA-12.2	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Baffinland should be required to disclose the triggers that result in corrective actions being taken.	Thresholds and triggers will be established as appropriate in the future operations geotechnical monitoring program that will form part of the Railway Operation and Maintenance Plan. Triggers that will result in corrective	Unresolved	This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway.	See Baffinland's response to QIA-11.1.	

			actions will be defined after the completion of the construction monitoring phase, as no detailed site-specific information is currently available to make an accurate assessment of the potential triggers. These triggers will be disclosed once they have been developed.				
QIA-12.3	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Baffinland should be required to update the NWB and reviewers on the effectiveness of the corrective actions.	Comments on the effectiveness of corrective actions can be provided as part of Baffinland's QIA and NWB Annual Report for Operations.	Resolved	QIA is satisfied by the response provided by Baffinland on August 23, 2019.		
QIA-13.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide figures that detail the field monitoring proposed to be completed as part of the construction, operation and closure of the North Railway.	Sections 10.2.3.1 and 10.2.3.2 describe the proposed monitoring along the North Railway during the construction and post-construction phases, respectively. For example, Section 10.2.3.1 states, "*Monitoring will occur at active work areas along the North Railway during construction, as prescribed in a future Fisheries Authorization for crossings. This is expected to include turbidity monitoring downstream of active work areas, including crossing locations as well as downstream of quarries and soil spoils disposal areas (mainly former borrow pits and quarries).*"The location of the embankment and water crossings are presented on the detailed railway figures presented as Attachment 10 of the Water Licence amendment Application. A map of proposed monitoring locations for operations will be provided prior to the technical meeting. Monitoring locations associated with quarries will be identified within each quarry management plan.	Unresolved	QIA believes that Table 5.1 should include monitoring activities during closure of the north railway.	The operation phase monitoring locations are presented in the updated Northern Corridor Monitoring Program presented as Appendix H of the SWAEMP (Attachment 22 of the Updated Application). Some monitoring programs listed in Table 5.1 and depicted in the figure will need to continue during the active closure phase (and possibly for a period post-closure). However, this is articulated in the Interim Closure and Reclamation Plan. Section 2.3.1.4 of the ICRP states that a Final Closure and Reclamation Plan will be developed and submitted no later than one year or earlier if possible before scheduled permanent closure, or immediately after notification of an unplanned closure. At this time, figures would be updated to reflect closure phase monitoring of the North Railway.	
QIA 13.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	Section 6.4.3 of the SWAEMP presents generic sediment and erosion control measures, with Baffinland's evaluation of performance based on its experience implementing each control measure.	Resolved	Erosion control measures are detailed with installation locations noted, which may be applied to either road or rail water crossings.		
QIA-14.1	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide the severity of the concern that requires immediate action be taken by Baffinland.	The response action framework for post-construction monitoring is outlined in Appendix C of the Roads Management Plan.	Unresolved	Appendix C was not provided by Baffinland to verify if any changes were made to address this comment.	The referenced text is from the Roads Management Plan, which is not a plan regulated by the NWB under the Water Licence. The referenced response action framework for post-construction monitoring is now presented in Appendix F of the SWAEMP. Response times cannot be provided on a scale as being requested by the QIA, as they are site-specific and depend upon the available	

						resources and urgency relative to other issues at the time.	
QIA-14.2	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide the frequency at which Baffinland would determine and prioritize any corrective actions to the Project road network.	Water quality monitoring is conducted per the schedule outlined in Appendix C of the Roads Management Plan, including a response action framework to address issues of sedimentation. Geotechnical inspections of the project are completed bi-annually as required by the Type A Water Licence, and recommendations are provided in the resulting report and are actioned on Site. Fish passage is assessed annually, and generally any identified issues are addressed in the calendar year. The exception is fisheries crossings where QIA has not granted approval for Baffinland to conduct adjustments to the Tote Road under the Commercial Lease.	Unresolved	Appendix C was not provided by Baffinland to verify if any changes were made to address this comment.	As noted in the response to QIA-14.1, Appendix C of the Roads Management Plan now appears as Appendix F of the SWAEMP. The QIA Environmental Monitors are integrated into Baffinland's environmental department, in terms of understanding how issues are prioritized day to day.	
QIA-14.3	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide what would trigger Baffinland to construct the approved Tote Road to the 2014 Hatch design.	Baffinland continues to upgrade the Tote Road through ongoing operation and maintenance, implementation of the Tote Road Earthworks Execution Program (TREEP) and implementing or restoring sections of the road to the Hatch design.	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.	Baffinland reviewed TRC 22 from the NIRB process and it is not related to this topic. Baffinland maintains that effective monitoring and mitigation that utilizes adaptive management, such as the framework outlined in the Roads Management Plan, is key to quantifying and minimizing any project related effects on the Tote Road. The Hatch 2013 design of the Tote Road, in combination with subsequent design work such as the Tote Road Earthworks Execution Plan (TREEP), continue to inform upgrades to problematic areas of the Tote Road in consideration of safety, traffic management and environmental impacts. The design of the Tote Road will continue to adapt to meet the demands of the Project, and will be informed by ongoing monitoring of the water crossings (Tote Road Monitoring Program), geotechnical stability (geotechnical inspections), and permafrost degradation (Milne Inlet Tote Road and Associated Borrow Source investigations). Additionally, design of the Tote Road will take into account feedback received from land users, such as the location of snowmobile crossings.	
QIA-15.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide the target areas identified as higher risk and validation for this assessment.	The complete list of target areas has not been identified. A study is currently underway to develop a geotechnical monitoring plan for use during the construction phase. The outcome of the construction geotechnical monitoring program will inform the operations phase geotechnical monitoring, to be incorporated	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		

			into the updated Railway Operation and Maintenance Plan. Examples of high-risk areas may include the four rail bridges over rivers, plate arch culverts, high embankments and deep excavations in both ice-rich and ice-poor soil areas.				
QIA-15.2	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-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.	Thermistors for sub-surface temperature profiling, as well as topographical survey markers and settlement plates will be installed at various locations to validate design assumptions and to monitor potential creep and thaw settlement.	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		
QIA-15.3	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide how the information gathered during the construction of the North Railway will be used to finalize the operational condition monitoring plan.	Data collected during the construction phase will be used to validate the design assumptions used for design analysis and modelling of thermal behaviour and changes to the permafrost regime. This will assist in identifying operations phase monitoring at representative and high-risk locations, for example at deep excavations, high embankments, or plate arch culverts. The operations phase monitoring program will evolve over time should results show a specific need for additional monitoring.	Unresolved	Triggers, Actions and Thresholds have yet to be established for geotechnical monitoring criteria.	See Baffinland's response to QIA-11.1.	
QIA-15.4	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide the inventory of rail condition monitoring equipment and locations.	The construction geotechnical monitoring program for the North Railway is currently being prepared and will be submitted for review in advance of the technical meeting. A draft list of monitoring equipment and locations are provided in a table presented as Attachment 10 of this response; however, this list is subject to change as the monitoring program is finalized. The final monitoring plan for the operations phase of the railway will be finalized following completion of the construction monitoring phase, when data collected has ben analyzed and final recommendations can be provided.	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		
QIA-16.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	A detailed outline of construction monitoring is provided as Attachment 05 (*Proposed North Rail Monitoring Program*). This includes a description of proposed monitoring of watercourses downstream of active construction areas in accordance with the Environmental Guidelines for Project Water Crossing Repairs, Modifications and/or Installations presented in Appendix C of the Roads Management Plan, which will be adapted for implementation during rail construction.	Unresolved	This concern remains outstanding until thresholds and responses are developed to include all analytical water quality monitoring parameters.	Baffinland has received from the QIA more than one round of comments on the SWAEMP including the indicators and thresholds in the Trigger Action Response Plan (TARP). The QIA's comments have been addressed in the latest version. Baffinland will continue to work cooperatively with the QIA to finalize these plans under the Water Licence and will continue to report progress where we can. It is not clear what remains outstanding in	

			The final monitoring program will be presented in an updated SWAEMP, to be made available in advance of the NWB technical meetings.			regard to incorporating all analytical water quality monitoring parameters.	
QIA-16.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	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.	The reference to Attachment 1 is not clear as there is no Attachment 1 in the referenced SWAEMP. Baffinland will update the applicable water quality monitoring plans to be consistent with the Adaptive Management Plan currently under development in consultation with the QIA. This includes incorporating the concepts of triggers, thresholds and actions presented in the Environmental Guidelines for Project Water Crossing Repairs, Modifications and/or Installations presented in Appendix C of the Roads Management Plan. This is articulated further in the detailed outline of construction monitoring presented in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This information has not yet been incorporated into the relevant management plans.	It is not clear what remains outstanding regarding to incorporating all analytical water quality monitoring parameters. Baffinland included a recent draft update of the SWAEMP (Attachment 22 of the Updated Application) which identifies agreed upon water quality thresholds related to surface runoff.	
QIA-16.3	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Describe how the proposed measures will mitigate the occurrence of an exceedance to water quality criteria.	See the detailed outline of construction monitoring provided as Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This information has not yet been incorporated into the relevant management plans.	Since this original comment was received, Baffinland incorporated the referenced construction monitoring details previously presented as Attachment 05 of the 2019 Water Licence Application into Section 5 of the SWAEMP (Application Attachment 22).	
QIA-17.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838)	Is Baffinland committed to completing these recommendations? If yes, when will the assessment and detailed design be shared for review and comment?	Yes, Baffinland is committed to completing these recommendations. An assessment of the single high-risk diversion will be undertaken in late August 2019, and site-specific modifications to the culvert design will be undertaken if appropriate following this assessment (i.e., through the fall of 2019). The resultant information will be presented in the application for an authorization under the Fisheries Act, to be prepared in late 2019 through early 2020. Baffinland can provide the QIA with this information once it has been developed. This is articulated in more detail on the construction monitoring outline provided as Attachment 05 (*Proposed North Rail Monitoring Program*).	Deferred	Refer to TC 24 1.4.		
QIA-18.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838) 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	Is Baffinland committed to completing these recommendations? If yes, when will the monitoring program be shared for review and comment?	Yes, Baffinland is committed to completing these recommendations. An outline of the proposed fish passage monitoring program is presented in Attachment 05 (*Proposed North Rail Monitoring Programs*). The resultant information will be presented in the application for an authorization under the *Fisheries Act*, to be prepared in late 2019 through early 2020.	Deferred	Refer to TC 24 1.4		

			Baffinland can provide the QIA with this information once it has been developed.				
QIA-18.2	Fish Passage Risk Assessment Update (KP Ref VA19-00838) 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	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.	The AEMP focuses on the assessment of long-term aquatic effects from multiple stressors within the Potential Development Area of the Mary River Mine. The Mary River Mine site is considered to be the worst-case scenario for impacts to the aquatic environment, including fish passage and habitat quality, due to multiple sources including surface runoff, discharges and dust. Baffinland suggests the SWAEMP is more appropriate as the project effects in the Northern Transportation Corridor are associated with construction and the monitoring program will be short-term focusing on validating that fish passage has been maintained.	Unresolved	This concern remains outstanding until triggers from the SWAEMP regarding the North Railway are captured in the AEMP.	Baffinland stands by its original response. The Northern Corridor Monitoring Program (now forming part of the SWAEMP) was developed jointly with the QIA. Baffinland's Commitment #201 in the NIRB review is as follows: Baffinland collects and reports data on fish presence, catch per unit effort, and fork length from 30-60 crossing sites along the Tote Road annually. Baffinland commits to adding observations regarding physical condition of fish (e.g., lesions, injuries, activity level). Baffinland and QIA will determine an appropriate approach to analysis and development of a metric for monitoring fish health for the 2022 reporting period. The program will be evaluated every three (3) years to determine if monitoring locations may be reduced due to no observations of project related impacts. This commitment will be incorporated into the Phase 2 version of the SWAEMP.	
QIA-19.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	These reports should be included in Baffinland's reporting to NWB.	Observations of erosion and sedimentation may be identified during General or Component Inspections described in Section 5.2 of the Railway Operation and Maintenance Plan. As noted in Section 1.3 of the same Plan, water quality issues will be dealt with in accordance with the relevant plans including the EPP and SWAEMP, as with any other erosion and sedimentation issue on the Project.	Unresolved	This concern remains outstanding until reporting criteria inclusive of sedimentation monitoring is provided in the amended Water Licence.	The SWAEMP (Attachment 22 of the Updated Application) presents the thresholds, actions and reporting requirements related to erosion and sedimentation project-wide including the railway.	

QIA-19.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	Provide the measures and what are the specific triggers to action them.	Rail operations staff will report any erosional events that are or have the potential to cause the release of sediment into watercourses to the Environment Dept. This would be the triggering event. Any remedial measures will be implemented consistent with the SWAEMP. Aside from potentially elevated TSS above thresholds described in the Water Quality Monitoring outline for rail construction presented in Attachment 05 (*Proposed North Rail Monitoring Programs*). Monitoring and sampling of select water crossings in the Northern Transportation Corridor will also include a visual inspection of crossings to assess erosion and sedimentation events, consistent with the monitoring framework outlined in the Tote Road Monitoring Program in the Roads Management Plan.	Resolved			
QIA 20.1	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	This work should be completed and provided by Baffinland prior to any construction approvals for the North Railway deviation is provided.	Further geotechnical investigations to confirm permafrost conditions along the North Railway deviation are planned in advance of construction, during winter 2019/2020. Any required updates to the Geotechnical Recommendations for Northern Railway report will be filed with the NWB.	Deferred	Refer to TC 24 1.4		
QIA 21.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	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.	A report on embankment cut sections cannot be produced unless actual cuts have been constructed and condition monitoring has taken place during construction. Following the construction monitoring phase, long-term monitoring will be proposed based on the findings from the construction monitoring program. Embankment cut sections have been studied in the thermal analysis reports and these have been presented as part of the FEIS Addendum.	Unresolved	This concern remains outstanding until further detail is provided in either the North Railway Monitoring Program or the mentioned drone-based monitoring program.	What is included in the amended Water Licence is the decision of the NWB. However, Baffinland suggests that a test embankment would inform engineering design, and that it is not relevant to regulatory reporting.	
QIA 22.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	Additional details regarding the frequency, and extent of the aerial assessments is requested.	Aerial Photosat imagery is already collected on an annual basis as agreed to with QIA. Aerial images from previous years will be compared with new images to identify areas of standing water which may indicate localized settlement has occurred.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	Aerial assessments or similar will form part of the Railway Monitoring Program, which will be incorporated into the relevant management plan.	

QIA 22.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	A specific trigger for when additional insulation is required should be considered in the Water Licence.	Triggers for when additional insulation or soil cover may be required will be determined after the completion of the construction monitoring phase, as no detailed site-specific information is currently available to make an accurate assessment of the potential triggers. Some triggers may relate to the safe operation of the rail line, such as excessive settlement (beyond what can be accommodated in the rail design) or cut slope failure as a result of freeze/thaw action within the active zone and changes to the local permafrost regime.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	This will form part of the Railway Monitoring Program, which will be incorporated into the relevant management plan. Baffinland suggests that the incorporation of geotechnical criteria is appropriate in the relevant management plan and not the licence.	
QIA 22.3	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland complete the aerial assessments committed to and report upon them.	Aerial assessments will continue to be undertaken annually with a report provided to the QIA as part of the Commercial Lease.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	Schedule D already lists conditions applying to construction and reporting, which includes the issue of settlement. This will form part of the Railway Monitoring Program, which will be incorporated into the relevant management plan. Baffinland suggests that the incorporation of geotechnical criteria is appropriate in the relevant management plan and not the licence.	
QIA 23.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide what monitoring would be conducted that could lead to mitigation measures.	Further to the QIA's comment on the hydrological modelling completed in 2017 as presented in the FEIS Addendum (Appendix C of TSD 13), the railway design was updated. Ten diversions will now occur, and these were assessed with updated hydrological modelling, presented as Attachment 04 to this response (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions*). Nine of the 10 stream diversions were assessed as low risk and the tenth stream diversion was assessed as medium risk. An outline of a proposed monitoring program is provided in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	Refer to 8.1 and 10.1.	Baffinland has responded to QIA-8.1 and QIA-10.1.	
QIA 23.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide the monitoring values that would trigger mitigation measures.	Monitoring will consist of visual inspection, survey transects and possibly TSS/turbidity monitoring if elevated TSS is observed as the result of erosion of the stream channel. The only numerical value that would trigger mitigation would be TSS above the thresholds identified in the Rail Monitoring memo provided in Attachment 05 (*Proposed North Rail Monitoring Programs*). Effects to stream morphology will be based on professional judgement with consideration of potential alteration of fish habitat.	Unresolved	Refer to 8.1 and 10.1.	Baffinland has responded to QIA-8.1 and QIA-10.1.	

QIA 23.3	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide reasoning when monitoring and adaptive management would not be needed during and post construction.	Monitoring will not be required following a full open water season (plus a preceding partial season, if applicable) indicates that the channel capacity is not being exceeded, subsidence or slope instability is not occurring, and if channel bed scour or sediment deposition is not occurring within what is judged to be normal limits. Proposed monitoring is described further in Attachment 05 (*Proposed North Rail Monitoring Programs*).	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.	Baffinland is prepared to continue to discuss this issue outside of the NWB process as indicated by the QIA.	
QIA 24.1	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	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 24.1.3 - North Railway As-Built reporting on time frequency basis 24.1.4 - A construction sequence	Baffinland suggests that this can be dealt with in Part D of the current licence, through the process of the NWB approving design drawings and reports, requiring the submission of as-builts with construction summary reports, and the implementation of mitigation measures and monitoring as described in the management plans approved under the Water Licence. Baffinland would be amenable to inclusion of water quality criteria for water crossings that consider the influence of background or upstream concentrations (i.e., natural conditions).	Unresolved	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).	Baffinland stands by its August 2019 response to this technical comment. The current Type A Water Licence was issued for construction of the south railway with similar features. Hence, the current licence already contains the appropriate reporting criteria for construction of a railway.	
QIA 24.2	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	This new Part should also provide requirements for construction reporting.	Construction reporting requirements are outlined in Part D, Item 17 of the current Water Licence.	Unresolved	Refer to 24.1.4.	Baffinland has responded to Recommendation 24.1.4.	
QIA 24.3	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	QIA is willing to work through the NWB process and review to support the development of draft terms and conditions.	Baffinland is also willing to discuss this further with the parties.	Resolved	QIA is in agreement with Baffinland August 23, 2019 response.		
QIA 25.1	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-	Provide a timeline for the completion of modelling; additional testing; final design; and final approval of the North Railway.	Thermal modelling has been completed and is provided in Attachments 8.4, 8.5, 8.9, 8.10 and 8.11 of the updated Application. Hydrological modelling is provided in Attachment 04 of this submission. Additional geotechnical testing will occur along the North Railway deviation in winter 2019/2020, and testing will continue through the construction phase. The final design has been completed and is shown on the plan and profile drawings in Attachments 11.1	Resolved	QIA is of the understanding that Baffinland is now solely seeking approval for the construction of Route 3.		

	ops-maint-DRAFT-PHASE-2		to 11.3 of the updated Application. While this design is final and approved for construction, it is recognized that there may be local changes due to site conditions.				
QIA 25.2	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	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.	Information on as-built deviations from the approved construction drawings will be provided in Construction Summary Reports to be prepared as required under Baffinland's Type 'A' Water Licence.	Unresolved	Refer to 24.1.4	Baffinland has responded to Recommendation 24.1.4.	
QIA 25.3	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	Provide a timeline for delivering the North Railway long term monitoring and maintenance plan for review, comment, and approval.	The long-term monitoring and maintenance plan for the North Railway will be finalized during the first year of railway operations. The development of this plan will take into account information and observations from the construction geotechnical monitoring program.	Unresolved	QIA has not yet received a copy of the draft long term monitoring plan.	As noted in Baffinland's August 2019 response, the long-term monitoring and maintenance plan will be finalized in the first year of railway operations. The short and long-term geotechnical monitoring plan is described in Attachment 8.15 of the Updated Application (Northern Railway - Instrumentation Monitoring Program).	
QIA-26.1	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board SIGs • 190502 2AM-MRY1325 Amend2 Applic-Att-3.2-SIG-Concord-ILAE • Nunavut Water Board. 2004. “Draft Guide for Community Consultation and Public Participation”. • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • FEIS Addendum TSD 04 Public Consultation	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.		Unresolved		The scope of the water licence amendment is included within the NIRB review, which has involved substantial community engagement. Baffinland has also conducted additional community engagement outside of the formal NIRB process. Water-related feedback is presented in Appendix 1.	Appendix 1 - Phase 2 Proposal Community Feedback Regarding Water

QIA-26.2	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board SIGs And other documents	As required by the SIGs, please list all Inuit concerns to date associated with water and how BIMC intends to mitigate those concerns.		Unresolved		A summary of Inuit concerns expressed to date and Baffinland's commitments regarding water from the NIRB review process is presented as Appendix 1.	Appendix 1 - Phase 2 Proposal Community Feedback Regarding Water
QIA-26.2a	Same as above			Supplemental	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.	A summary of Inuit concerns expressed to date and Baffinland's commitments regarding water from the NIRB review process is presented as Appendix 1. The concerns raised in the Tusaqtavut studies were consistent with those documented during the NIRB review.	Appendix 1 - Phase 2 Proposal Community Feedback Regarding Water
QIA-26.3	Same as above	Please describe any forthcoming opportunities provided by BIMC for Inuit communities to provide comment and raise their concerns on Water Licence Amendment changes.		Unresolved		The NIRB review has and continues to provide Inuit communities with the opportunity to comment on the Phase 2 Proposal including water. The NWB has invited Inuit community representatives to attend the Nov 12, 2021 technical meetings. If additional focused engagement is requested at that time Baffinland will work with the community representatives to schedule additional meetings related to water. Baffinland notes that ongoing work to collect IQ from the communities to develop programs agreed to under the Inuit Certainty Agreement is ongoing. QIA is generally leading engagement, however, there are opportunities for Baffinland to attend in person IQ sessions if participants are comfortable. Baffinland is open to additional engagement opportunities with Inuit communities, but the volume of already planned and relevant engagement activities related to water is substantial and will look directly to communities to gauge their desire for additional engagement.	
QIA-26.4	Same as above	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.		Unresolved		Baffinland agrees to this commitment. Baffinland has funded the QIA-led freshwater IQ studies currently underway. Additionally, the QIA will be working with the communities to develop Inuit Objectives, Indicators, Thresholds and Responses (OITRs) that Baffinland has committed to incorporating into its water-related management plans. **Commitment**: Baffinland commits to incorporating Inuit Objectives, Indicators,	

						Thresholds and Responses (OITRs) into its water-related management plans.	
QIA-26.5	Same as above			Supplemental	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.	Baffinland maintains that questions on the routing of the North Railway are outside the scope of the NWB review. This question has already been discussed in detail and is being addressed in the NIRB review.	
QIA-27.1	• 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	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.		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	Baffinland is not aware of any Inuit concerns regarding the proposed water withdrawal stations. Baffinland has funded a QIA-led study that is currently underway to collect this information. Impacts to Inuit water use that are identified can be addressed by the new Water Compensation Agreement.	
QIA-27.2	• 190502 2AM-MRY1325 Amend2 Applic-Att-23-FWSWMP-Part1-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-Part1-ILAE • Knight Piésold. November 2018. "Mary River Project – Fresh Waterbodies with Unique Value and/or Cultural Significance to Inuit" And other documents	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. 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.		Unresolved		Response to a. Appendix 2 of this response is a report that Baffinland provided previously to the QIA in support of Water Compensation Agreement negotiations for Phase 2. This report summarized the information collected during Baffinland's earlier IQ studies and identifies the 20 questions used to collect this information. An important distinction of Baffinland's earlier IQ study was that information was sought on Inuit knowledge and land use within each community's entire land use area. This helped Baffinland understand the relative importance of different areas to Inuit land use, a perspective not gained by studies that focus on a specific area. Response to b and c. Baffinland has provided the QIA with funding to support the QIA's supplemental IQ studies, described in other responses. This information will be used to inform a new Water Compensation Agreement, and will also be used to develop Inuit Objectives, Indicators, Thresholds and Responses (OITRs) that will be integrated into Baffinland's management plans. For almost two years, Baffinland has been revising and incorporating the QIA's feedback on its draft Phase 2 management plans. Most of the management plans attached to the Application have incorporated at least one round of QIA comments. The AEMP and SWAEMP have received multiple rounds of	Appendix 2 - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit

					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.	review by the QIA. The basis for the QIA considering this item unresolved is not clear to Baffinland given the QIA's central role in collecting additional project area-specific information on Inuit waters of importance, and the agreed-upon approach to incorporate Inuit OITRs into the Phase 2 management plans.	
QIA-27.3				Supplemental	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: 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.	Baffinland has identified waterbodies of heightened importance within the Regional Study Area is described by KP (20I8) in Appendix 2. This includes the Robertson River / Qurluktuk located northwest of Milne Port, the Tugaat River located east of Milne Port, and the Ikaluit River at the head of Tay Sound. Each of these waterbodies are used to harvest sea-run arctic char. Each of these waterbodies are removed from the Project. Aquatic studies were planned at each of these three waterbodies in 2021 in fulfillment of Project Certificate condition 48a. The 2021 field programs were successfully completed in Qurluktuk and Tugaat systems, but the studies in Ikaluit River were not completed as proposed due to inclement weather preventing access. Results from these studies will be shared with the MHTO. The results of these studies and the QIA's Culture, Resources and Land Use (CRLU) studies currently underway could yield additional waterbodies of heightened importance and will help to identify potential impacts and mitigation measures. The CRLU studies are the assumed responsibility of QIA, with funding provided by Baffinland.	Appendix 2 - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit
QIA-27.4				Supplemental	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	The siting of the railway is first and foremost influenced by its proximity to the Tote Road (to minimize the overall footprint), also considering geotechnical conditions, Inuit feedback on overall routing, and the absence of archaeological sites of high cultural significance. Bridge and other crossing locations are dictated in large part by permafrost conditions and the rail routing, and repositioning crossings to avoid areas results in a cascade of changes in the alignment in either direction. Because of grade limitations and turning radius constraints, the routing of a railway is much more complicated and constrained than a road. The construction of crossings for wildlife and snowmobiles, for example, has resulted in a wider embankment	

					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.	with a larger footprint and longer culverts that can present an issue for fish passage. There are a number of trade-offs that need to be balanced in siting the railway. Baffinland has spoken to these constraints in both the Phase 2 EIS documentation and at technical meetings and hearings. Routing alternatives including Inuit feedback on routing have been covered extensively in the NIRB review, and such alternatives are considered at the environmental assessment stage, not during licensing. More minor features such as quarries and laydown areas were sited based on the availability of suitable rock or ground, proximity to the railway (reduced footprint and transportation costs), and the absence of important archaeological sites. Water withdrawal locations are largely dictated by the availability of suitable flow, proximity to the existing Tote Road, and distance between each water station (to minimize the distances the water trucks need to travel between the water sources and the sections of road being watered). Since water withdrawals at all locations identified in the Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application) meet DFO's threshold of <10% of instantaneous flow, and the withdrawals are very short term (20-40 minutes) and intermittent, they are not expected to adversely affect Inuit use of the same waterbodies. Inuit were not asked about each and every minor project component (quarry, laydown area, water crossing, etc.) as this is not practical. However, Baffinland remains open to considering Inuit feedback on these features in the NIRB review, this licence amendment process and from the QIA's ongoing CRLU studies. Parties need to understand that there are cascading effects of avoiding specific locations in terms of having to realign a much larger section of the railway, as described above and elsewhere. The railway alignment as proposed represents Baffinland's efforts to optimize all of these considerations.	

QIA-27.5				Supplemental	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.	IQ collected by Baffinland identified the Phillips Creek watershed, mine site area lakes and the upper part of the Ravn River as containing only land-locked populations of arctic char. Important sea-run lakes that are outside of the immediate Project footprint (i.e., Qurluktuk, Tugaat and Ikaluit) were also identified. Our understanding of what Inuit consider important vs. unimportant fish habitat mainly relates to waterbodies containing sea-run char (important) vs. land-locked char (less important but not unimportant). Inuit were not involved in the 2018 fisheries surveys unfortunately. However, Inuit participated in the 2019 and 2021 field program. Baffinland is pleased to say that one of the Inuit field assistants involved in the 2021 field program is now working fulltime based in Winnipeg for the consultancy that completed the fisheries work.	
QIA-28.1	• 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)”. And other documents	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.		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 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	Baffinland reviewed and considered the Tusaqtavut studies during the NIRB review process. Baffinland has provided funding to the QIA to complete freshwater-specific IQ studies. The intent of the study was to gather information from Inuit about where and how to monitor water, and what actions should be taken to protect the freshwater environment. It is Baffinland’s understanding this work has since been completed by the QIA with the community of Pond Inlet in October 2021. A verification workshop on this study will be held in late November 2021. It is expected that a final report will be completed in December 2021. Study findings will be integrated into the CRLU assessment. Findings from this Study may be used to further inform mitigation, monitoring, and compensation, and adaptive management measures in Baffinland's management plans.	

QIA-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 on Inuit Owned Lands can be conducted through an Inuit/IQ enriched lens.		Unresolved	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.	To date, Baffinland has undertaken extensive work to collect IQ on freshwater resource. These efforts, and the outcomes of IQ studies is documented in TSD-05. The QIA's own Tusaqtavut studies were reviewed and considered during the NIRB review. Additionally, as the QIA is aware, Baffinland has provided funding to the QIA to complete freshwater-specific IQ studies. The intent of the study was to gather information from Inuit about where and how to monitor water, and what actions should be taken to protect the freshwater environment. It is Baffinland's understanding this work has since been completed by the QIA with the community of Pond Inlet in October 2021. A verification workshop on this study will be held in late November 2021. It is expected that a final report will be completed in December 2021. Study findings will be integrated into the CRLU assessment. Findings from this Study may be used to inform mitigation, monitoring, and compensation, and adaptive management measures. Any modifications made to the Project as a result of this Study will be reflected in the Adaptive Management Plan and sub-plans.	

QIA-28.3				Supplemental	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.	Baffinland has provided impact pathway breakdowns for all valued components identified in the Tusaqtavut Study, which includes fish and freshwater (refer to Appendix 3). These breakdowns have been considered with the development of the impact pathway database. Additionally, as the QIA is aware, Baffinland has provided funding to the QIA to complete freshwater-specific IQ studies. As QIA outlined, the intent of the study was to gather information from Inuit about where and how to monitor water, and what actions should be taken to protect the freshwater environment. It is Baffinland's understanding this work has since been completed by the QIA with the community of Pond Inlet in October 2021. A verification workshop on this study will be held in late November 2021. It is expected that a final report will be completed in December 2021.	Appendix 3 – Tusaqtavut Pathway Breakdown – Effects Assessment Summary Table (Fish and Freshwater)
QIA-29.1	• 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	Describe what IQ was collected during these workshops related to Snow Management and how it informed and or changed the Snow Management Plan.		Unresolved		Snow stockpiles were visited by participants during the 2019 Community Risk Workshops. Snow management was identified as a concern. Specifically, runoff from snow stockpiles during melt periods, and concern about impacts of dust (e.g., along the side of the road; when snow melts, there is a lot of sediment accumulation) were among the issues recorded as concerns. Recommended mitigation included: - Clear snow - Keep culverts functional - Monitor streams Each of these mitigation measures form part of the Snow Management Plan.	
QIA-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.		Unresolved		The Snow Management Plan is not currently required under the Water Licence, and was developed at the QIA's request, to address acknowledged runoff quality issues associated with snow stockpiles. The Snow Management Plan in its current form (with adaptive management and a trigger action response plan) was first provided to the QIA for review in mid-2020, and one round of comments have been incorporated in the latest version provided to the QIA in October 2021. Baffinland will continue to work with the QIA to refine this plan over time, as part of the	

						Commercial Lease. This includes incorporating any IQ identified as relevant to snow management collected by the QIA.	
QIA-30.1	• 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	Describe how IQ has informed aquatic monitoring programs and recent revisions to relevant monitoring and management plans.		Unresolved		Baffinland has agreed to incorporate Inuit Objectives, Indicators, Thresholds and Responses (OITRs) into its management plans including the AEMP as per the QIA's request. This process is still ongoing, and Baffinland awaits additional Inuit input into these plans. Baffinland shared a draft copy of the amendment application on April 14, 2021. QIA did not provide any comments before the draft was finalized and submitted on September 17, 2021. Baffinland suggests that QIA is best positioned to describe how Inuit led monitoring programs to be led by QIA should be considered by the NWB. Baffinland will work with the QIA to ensure these monitoring programs are understood and represented in an amended Water License prior to the Public Hearing.	
QIA-30.2		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.		Unresolved		This is a comment provided on October 25, 2019 that wasn't responded to previously. Baffinland has made this commitment through the ICA, and the QIA is actively working to engage the communities on water-specific IQ studies and monitoring programs.	
QIA-30.3		Provide further information on what role the Proponent is committed to having Inuit play in developing priority SNP site locations and related monitoring activities.		Unresolved		Baffinland believes the Inuit Stewardship Plan under the ICA provides the mechanism to engage Inuit on monitoring. The SNP program, however, is dictated by the NWB.	
QIA-30.4		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/Inuit Panel for the Project, in relation to water planning, effects assessment, monitoring and adaptive management.		Unresolved		Baffinland believes the process for accomplishing this has been outlined in the Inuit Certainty Agreement that has been negotiated with the QIA. Baffinland is aware that the QIA has made good progress on the CRLU study and monitoring program.	

QIA-30.5				Supplemental	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.	Under Phase 2, an Inuit-led water quality monitoring program is covered in Section 17.1.3 of Schedule 17 of the ICA. Baffinland's understanding is that it will be part of the CRLU monitoring program administered under the Inuit Stewardship Plan, which QIA has sole responsibility for developing and implementing. Baffinland will be making fixed annual IIBA implementation payments to QIA to cover the cost of the CRLU monitoring program, among other things. Baffinland understands the QIA has been actively engaging Inuit in freshwater IQ studies, and Baffinland anticipates that the outcomes of that work to contribute to the Inuit led water quality monitoring program for Phase 2. Further discussions around alignment with Baffinland-led programs will occur as QIA is prepared to engage.	
QIA-31.1	NIRB document 210203-08MN053-QIA Inuit Certainty Agreement-IA1E			New	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.	Baffinland's position is that there is already a path forward for resolution of this item through the ICA for Phase 2. This information is not required to evaluate the Updated Water Licence Application.	
QIA-31.2	Same as above			New	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.	As described in Section 1 of the Inuit Certainty Agreement, Inuit-led monitoring of the Phase 2 Project will be managed under the Inuit Stewardship Plan (ISP), to be authored by QIA. The proportion of technical/scientific monitoring to Inuit-led monitoring initiatives in the future will depend on the scope of activities put forth in the ISP, and while Baffinland will provide input into the development of this plan and has committed to fund the ISP for the life of the Mary River Project. it would not be appropriate for Baffinland to prescribe the scope of monitoring to be undertaken under the ISP. Baffinland is committed to implementing both technical/scientific monitoring works and activities, as well as Inuit-led, IQ-driven monitoring works for the Mary River Project and will continue to work with QIA on these	

						initiatives, however Baffinland considers this to be outside the scope of the NWB process.	
QIA-32.1	210917-2AM-MRY1325-Amend2-Applic-Att-3.2-SIG-Concord-IAAE				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.	Alternatives assessment is a key focus of the NIRB review, not water licensing. It should be noted that everything in the public record in the NIRB review process relating to alternatives builds on TSD-01; it is not necessary to update the document.	
QIA-32.2	Same as above				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.	Alternatives assessment, including rail routing, has been a subject area discussed at length in the NIRB review, and is available on NIRB's public registry.	
QIA-33.1	• 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt1of3-IAAE • 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt3of3-IAAE			New	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.	Baffinland will provide a supplemental filing (concordance table) with the next revision of the ICRP that identifies how and where the QIA's previous comments on the ICRP have been considered. The next revision of the ICRP and the supplemental filing will be provided before the NWB public hearing. **Commitment**: A supplemental filing will be provided with the next revision of the ICRP that identifies how and where the QIA's previous comments on the ICRP have been considered.	
QIA-33.2	Same as above			New	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.	Appendix G of the ICRP includes excerpts from the FEIS, which incorporated IQ and the results of Inuit engagement. The methodology for community-based research undertaken for the FEIS is presented in FEIS Appendix 2B, and the public consultation report is FEIS Appendix 2C. Collected IQ was presented throughout the various FEIS volumes. This question is not relevant to water licensing.	
QIA-33.3	Same as above			New	Baffinland to identify any plans it has to engage Inuit parties moving forward in the steps outlined in #2 above.	The Nunavut Impact Review Board process for the review of the Phase 2 Proposal has provided and continues to provide opportunities for Inuit to share input on the residual effects characterization methodology and the findings of the environmental assessment.	

QIA-34.1	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			New	QIA requests involvement in developing habitat features and selecting appropriate habitat compensation both in kind and otherwise as necessary.	**Commitment:** Baffinland will consult with QIA concerning plans for fish habitat offsetting.	
QIA-35.1	• 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			New	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.	Discharge volumes from surface water management ponds are recorded in accordance with Water Licence requirements and this allows for Baffinland or reviewers to determine mass loadings as referenced. Baffinland does not consider discharge volume to be a useful performance indicator as the volumes of effluent discharged from surface water management ponds are a function of the amount of runoff reporting to these facilities, which is largely dependent on precipitation levels which are out of Baffinland's control. The effluent is discharged in accordance with Baffinland's management plans governed under the Water Licence.	
QIA-36.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan 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			New	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.	The priority is to place soil spoils in borrow pits along the Tote Road and exhausted quarries adjacent the railway. Section 4.9 of the Updated Application discusses the volumes of soil spoils requiring disposal in relation to the available space in quarries. It is expected that all the soil spoils generated along the railway (estimated to be 1.8 Mm3) can be placed in borrow pits and quarries (available capacity ~5.5 Mm3). Therefore, there is more than enough capacity available with contingencies. This approach will reduce the use of dedicated disposal sites that would occupy additional land.	
QIA-36.2	Same as above			New	Clarify if spoils will be stored in such a way as to permit access to promote revegetation at closure.	Soil spoils disposal areas will be constructed for closure and will naturally revegetate. Future access will not be required.	
QIA-37.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal			New	Baffinland develop and implement a monitoring program for all stages of the project including background, construction and operational monitoring and provide a	Reference to contractors developing general construction monitoring procedures in no way relinquishes Baffinland's responsibility for environmental compliance. Contractors will be required to develop their own procedures and processes to meet the requirements of the	

	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				parameter list that is indicative of all potential parameters of concern.	Water Licence, legislation, and Baffinland's own management plans (which are approved under the Water Licence). The QIA stated, "all components of the aquatic environment monitoring program and Surveillance Network Program (SNP) must be presented for each stage of the project." Not all components of the Project at all stages will form part of the SNP. Temporary construction fronts are an example of this, and why the terminology is included in the management plans. The QIA requested, "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." This monitoring program exists in the form of the Water Licence which includes the SNP, the AEMP and other monitoring programs. These programs and management plans have been in place since 2013, and thus do not require development.	
QIA-38.1	• 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			New	Baffinland clarify the criteria they will use to determine if quarries have the “potential” for acid rock drainage or metal leaching.	Thresholds for acid rock drainage and metal leaching are presented in Table 3.1 of the Borrow Pit and Quarry Management Plan (Attachment 26 of the Updated Application).	
QIA-38.2				New	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.	The first preventative measure is regular testing of rock in quarries against the ARD/ML testing thresholds in Table 3.1 of the Borrow Pit and Quarry Management Plan (Attachment 26 of the Updated Application). Based on testing of quarry rock along the railway to date, the likelihood of ARD or ML is low. However, small pockets of potentially acid generating or metal leaching rock could still be encountered. This material will be handled in accordance with Section 3.4 of the Borrow Pit and Quarry Management Plan.	

QIA-39.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.0 Monitoring • Table 5.1 Monitoring Programs page 56 of 109			New	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.	Baseline data for monitoring is presented in the FEIS as well as the AEMP. Baffinland has accumulated baseline (pre-rail construction) water quality through implementation of the Tote Road Monitoring Program.	
QIA-39.2				New	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	Baffinland is in Year 7 of operations, and the management plans reflect this. It is not clear what the QIA is requesting in terms of dates or timelines when each phase is expected to take place. The mine is currently operating and will temporarily enter a combined construction phase (Phase 2 construction) while the mine continues to operate. Baseline water quality monitoring began at the site in 2004 and has been ongoing through implementation of the existing Water Licence SNP program and the various other monitoring programs since 2013. Post-construction verification specifically refers to the period immediately following completion of construction of a given project component (i.e., water crossing).	
QIA-39.3				New	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)	Each of the referenced monitoring programs (SNP, NCMP, snow management monitoring, groundwater monitoring, Type B Water Licence Monitoring and AEMP) are already established and will continue through construction of Phase 2 components of the Project and the Project's entire operation phase, in accordance with Water Licence and Commercial Lease requirements.	

QIA-40.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.0 Monitoring • Table 5.2 Surface Water and Aquatic Ecosystems Trigger Action Response Plan			New	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.	With respect to more conservative thresholds for low, moderate, and high-risk thresholds, Baffinland will continue to adhere to Water Licence discharge limits as the moderate risk threshold, an approach requested by the QIA during refinement of these management plans over the past two years. More conservative thresholds may unnecessarily constrain construction activities without necessarily providing additional environmental protection. With respect to adding fish health measures to the response-action framework, Baffinland refers the QIA to Commitment No. 201, which was developed jointly and was agreed upon by both parties: *Baffinland collects and reports data on fish presence, catch per unit effort, and fork length from 30-60 crossing sites along the Tote Road annually. Baffinland commits to adding observations regarding physical condition of fish (e.g., lesions, injuries, activity level). Baffinland and QIA will determine an appropriate approach to analysis and development of a metric for monitoring fish health for the 2022 reporting period. The program will be evaluated every three (3) years to determine if monitoring locations may be reduced due to no observations of project related-impacts.* Regarding the QIA's request to have iron and chloride added to the response-action framework for road operation, Baffinland disagrees. There is not a meaningful source of iron to warrant testing. Chloride is applied as a dust suppressant only intermittently (most dust suppression is with only water, and DustStop is being evaluated). Regarding the QIA's request to add NH_3-N, NO_3 and total N to the monitoring programs for borrow pits and quarries, these parameters are tested and the effluent must be acutely non-toxic.	

QIA-41.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.2 Routine Inspections • Table 5.3 Routine Inspections and Monitoring Requirements			New	QIA requests the aforementioned items be included in the inspection routine or an explanation be provided for their absence.	With respect to adding flow meter readings to monitoring under the SWAEMP, effluent discharge volumes are recorded as required by the Water Licence but under the Fresh Water Supply, Sewage and Wastewater Management Plan (not the SWAEMP).	
QIA-42.1	• 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			New	Provide the criteria Baffinland utilizes to determine when a berm or other drainage control measure is considered necessary.	Selection of the appropriate erosion and sediment control measure is site-specific and is based on professional judgement. The TARP provides the triggers that prompt a response to take action.	
QIA-43.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.6 Northern Corridor Monitoring Program • Figure 5.1 Northern Corridor Monitoring Program Adaptive Management Framework • Appendix H Northern Corridor Monitoring Program • Section 5. TSS Water Quality Criteria and Response-Action Framework • Figure H.4 TSS Response-Action Framework			New	Baffinland propose a more conservative threshold for action with regard to the Northern Corridor Monitoring Program.	The existing thresholds in the Northern Corridor Monitoring Program were agreed upon jointly by Baffinland and the QIA.	

QIA-44.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.7 Fish Passage Monitoring			New	Baffinland include fish health data including fish presence, catch per unit effort, fish length, fork length, lesions and injuries in their adaptive management plan.	Baffinland made this commitment to the QIA in the NIRB review process. Commitment No. 201 was developed jointly and was agreed upon by both parties: Baffinland collects and reports data on fish presence, catch per unit effort, and fork length from 30-60 crossing sites along the Tote Road annually. Baffinland commits to adding observations regarding physical condition of fish (e.g., lesions, injuries, activity level). Baffinland and QIA will determine an appropriate approach to analysis and development of a metric for monitoring fish health for the 2022 reporting period. The program will be evaluated every three (3) years to determine if monitoring locations may be reduced due to no observations of project related impacts.	
QIA-45.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.7 Fish Passage Monitoring			New	Request commitment to annual inspections for life of mine.	Annual inspections will be conducted by a Professional Fisheries Biologist for five years following installation of the culverts at high-risk locations on the North Railway. The need for further monitoring will be determined following the 5-year program based on the monitoring results. This commitment will be incorporated to the draft *Fisheries Act* Authorization (FAA) scheduled for completion in May 2022 and shared for review and comment.	
QIA-46.1	• Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix C Site Drainage and Monitoring Figures 6.1 and 6.2 • Appendix G Surveillance Network Program Schedule • Schedule G.1 – Construction Phase SNP Stations – Milne Port			New	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.	The term "significant precipitation event" is specified in the Water Licence but it is not defined. Baffinland interprets this to mean heavy rainfall. With respect to SNP stations MS-C-C and MS-C-D, these SNP stations will disappear once the SDLT-1 Pond shown on the figure and approved under Modification Request No. 13 is constructed. These stations will continue to be monitored until the pond is constructed. With respect to stations MQ-C-A through MQ-C-E, these are identified in the Quarry Management Plans and are not official SNP stations, as they do not appear in Table 14 of the Water Licence (including updates).	

QIA-47.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan 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			New	Baffinland commit to sampling for three years after water crossing construction or disturbance with monitoring during operations considered acceptable.	Baffinland will conduct post-construction monitoring as described in the Environmental Guidelines for Water Crossing Repairs, Installations and Modifications (Appendix F in the SWAEMP), which was developed jointly with and approved by the QIA. The Northern Corridor Monitoring Program will also be ongoing at select crossings. Routine inspections both during construction and operation are specified in the TARP in the SWAEMP, and if visual evidence of erosion or sedimentation is observed, this triggers notification of the Environmental Department, which will undertake sampling, as well as action by the relevant department to mitigate the issue.	
QIA-48.1	• Surface Water, Aquatic Ecosystem Mgnt Plan 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 • Section 7. Action Response Framework During Construction			New	Identify a single exceedance as a trigger to investigate mitigative actions (i.e., sediment control fencing or rip rap placement).	The QIA is incorrectly interpreting Section 7 of the Construction Monitoring section in the Environmental Guidelines for Water Crossing Repairs, Installations and Modifications. The trigger is 75% of the threshold (i.e., 75% of a maximum increase of 100 mg/L TSS, which is a maximum increase of 75 mg/L). This is articulated a different way in Table 5.2 in the SWAEMP: the low-risk condition is when downstream turbidity and/or TSS are between 75% and 100% of the applicable water quality action level (+25 NTU turbidity and/or +100 mg/L TSS over background).	
QIA-49.1	Surface Water, Aquatic Ecosystem Management Plan Rev G Appendix G Surveillance Network Program Schedule Schedule G.3 – Operation Phase SNP Stations – Milne Port Schedule G.4 – Operation Phase SNP Stations – Mine Site			New	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.	Water collected in the landfarm (including snow dump) are controlled discharges. This water is only discharged after testing has shown the effluent is below applicable discharge limits. Due to the intermittent nature of the discharge and pre-discharge testing, weekly testing is not required.	
QIA-49.2				New	Iron be added to the parameter list for contaminated snow dumps.	Hydrocarbon-impacted snow is disposed of in this facility, and not snow containing ore. Therefore, Baffinland proposes the monitoring requirements outlined in Schedule I remain for the landfarm.	

QIA-49.3				New	Confirm water being transferred between water control ponds is being measured.	Discharge volumes are monitored only during final discharge to the receiving environment. There is no regulatory basis for monitoring and reporting effluent volumes transferred between ponds prior to final discharge, and the QIA's concern is in regard to final discharges to the receiving environment. Baffinland may record the volumes of water being transferred between ponds for its own information.	
QIA-49.4				New	Increase monitoring of stockpile surface runoff to weekly to confirm compliance.	Regarding SNP stations MS-07 (ROM ore stockpile) and MS-10 (future SDLT-1 pond), these ponds are sampled prior to discharge, as well as during discharge, as described in Section 3.5 and on Figure 3.3 of the Fresh Water Supply, Sewage and Wastewater Management Plan (Attachment 23). Weekly sampling would be appropriate if these were flow-through ponds that continuously discharged, but they are controlled discharge ponds. Baffinland's practice of sampling prior to and during discharge, and pausing discharge if sampling detects parameters above Internal Discharge Limits (less than the Water Licence Discharge Limits) is highly protective of the environment.	
QIA-50.1	• Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix H Northern Corridor Monitoring Program • Section 4. Monitoring Frequency			New	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.	In the preamble of this technical comment, the QIA states the following: *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.* This is not accurate. Section 20.3.1 of Article 20 states: *No project or activity within the Nunavut Settlement Area which may substantially affect the quality of water flowing through Inuit Owned Lands, or the quantity of such water, or its flow, shall be approved by the NWB unless the applicant for a licence has entered into a compensation agreement with the DIO for any loss or damage which may be caused by the change in quality, quantity or flow of the water or the NWB has made a determination in accordance with Section 20.3.2*. The Northern Corridor Monitoring Program has been adapted from the Tote Road Monitoring Program developed jointly between the QIA and Baffinland. The QIA approved this sampling	

						program. The focus was on managing erosion and sedimentation and monitoring of oil and grease when visual evidence warrants is appropriate adaptive management.	
QIA-51.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.6 Northern Corridor Monitoring Program • Appendix H Northern Corridor Monitoring Program • Section 5. TSS WQ Criteria and Response-Action • Figure H.4 TSS Response-Action Framework			New	Include iron and chloride in addition to TSS in the adaptive management framework and response-action framework for the Northern Corridor Monitoring Program.	**Commitment**: Baffinland agrees to establish thresholds for iron and chloride as part of the Northern Corridor Monitoring Program. This will be reflected in the next update of the SWAEMP.	
QIA-52.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Rail Crossings			New	Provide a reference to the specific protocols that were developed.	The reference (Baffinland, 2012a) is provided in the references section of the report: Baffinland. 2012a. Mary River Project - Final Environmental Impact Statement. Volume 7: Freshwater Environment. February 2012. Volume 7 references Appendix 7C for the complete methodology.	
QIA-53.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 1.0 Introduction			New	Provide site specific data for each crossing	Site-specific data for each crossing are provided in Appendix 4 of the North Railway Freshwater Habitat Survey: 2018. More recent study results are provided in Appendix 4 of this response.	Appendix 4 - Project Infrastructure Interactions with Fresh Water Streams and Ponds (NSC, 2021)
QIA-54.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.2 North Rail Bridges			New	Provide rationale for this change in methodology.	Electrofishing was not undertaken at the North Railway bridges in 2018 as flow conditions were too high for the river to be sampled effectively. Previous field studies have established the presence of fish in each river and that all are important, fish-bearing waterbodies. The habitat survey transect length was 120 m (60 m upstream and downstream). This survey length was considered adequate to assess local habitat conditions.	

QIA-55.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Railway			New	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).	Potential stream barriers were assessed in the field using a clinometer.	
QIA-55.2				New	Provide references that indicate that a stream gradient of 15° is difficult or impassable for Arctic Char.	The 15° gradient threshold was derived from past field experience from working in the region since 2008. There are no published references that support this value.	
QIA-56.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.3 North Rail Lake/Pond Encroachments/Infilling			New	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?	No fish captured after sampling a 100 m long section was combined with other field data before designating a stream section as non fish bearing. This work was conducted by a Professional Biologist. In general, we are confident that non fish bearing stream sections were classified correctly.	
QIA-57.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.4 North Rail Stream Diversions – page 14 of 62			New	What additional studies were completed to address the reduction in flow to the unnamed lake downstream of CV-90-4?	The unnamed lake downstream of CV-90-4 was assessed with a sidescan echosounder to determine bathymetry and substrate distribution. The lake is assumed to include seasonal use by Arctic char but may include overwintering. The railway design has changed and there currently is no expected flow reduction downstream of CV-90-4.	
QIA-57.2				New	How will water levels in the unnamed lake be mitigated from the diversion at CV-90-4?	The railway design has changed and there currently is no expected flow reduction downstream of CV-90-4. The affected tributary includes a barrier at its mouth and the crossing location is non fish bearing.	
QIA-57.3				New	Have studies been completed to understand the contribution of water from this upper reach to the lake?	No. There is no diversion currently planned at CV-90-4.	
QIA-57.4				New	Will the diverted water ultimately flow back into the unnamed lake or a different receiving waterbody?	The railway design has changed and there currently is no expected flow reduction downstream of CV-90-4.	
QIA-58.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.2.1 North Rail Crossings			New	Confirm if fish sampling surveys were completed at these sites.	Fish sampling surveys were completed at all stream crossings along the North Railway. More recent study results are provided in Appendix 4 of this response.	Appendix 4 - Project Infrastructure Interactions with Fresh Water Streams and Ponds (NSC, 2021)

QIA-59.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.5 North Rail Stream Diversions			New	Confirm if all engineered drawings have been provided for the stream diversions.	Diversions are shown on the detailed plan and profile drawings in Attachment 11.3 of the Updated Application. Engineered drawings have not been developed for the diversions themselves.	
QIA-59.2				New	Confirm if the drawings show the reconstruction channel and tie into the downstream waterbody.	The engineered drawings for the diversions have not been developed.	
QIA-60.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 1 of 4– page 17 of 25			New	What monitoring will be completed to ensure there is no impact to fish and fish habitat?	No monitoring of the water withdrawal streams is proposed. This is not normal practice, and nor is it required because the pumping rates and other mitigation measures identified in the Detailed Water Withdrawal Plan will be adhered to. Baffinland's Environment Department periodically audits water withdrawal operations to ensure appropriate procedures and mitigation measures are being employed.	
QIA-60.2				New	How will stream flow be measured during the time of any withdrawals to establish what the 10% flow rate is?	It is not practical to measure flow in streams during water withdrawals. The approach of applying flow duration curves for the 12-year period of record is a practical way of checking that the 10% threshold will not be exceeded.	
QIA-60.3				New	What is the monitoring and mitigation plan if the maximum pumping rate was overestimated for a waterbody?	There is no monitoring and mitigation plan if the maximum pumping rate was overestimated for a waterbody. The only way that this would occur is if a larger catchment boundary incorrectly delineated. Catchment boundaries for each stream location was subject to review, and major errors are unlikely. Additionally, the water withdrawals are short-term events (~20-40 minutes). In practical terms, if the flow was meaningfully overestimated, it is likely that the operator will have difficulties submerging the intake.	
QIA-61.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 1& 2 of 30			New	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)?	Baffinland adheres to DFO's Code of Practice for fish screens, as specified in Part D, Item 6 of the Water Licence. Baffinland notes that the referenced 1995 guideline has been replaced with a 2020 code of practice. This assessment is completed upon deployment of a pump, and the operator monitors the intake during pumping activities.	

QIA-61.2	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 1& 2 of 30			New	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?	If a site is determined to be inappropriate for use, it will no longer be used. Other nearby approved stations will be used. If a viable alternate can be identified nearby, Baffinland will submit a notification to the NWB accompanied by a hydrology assessment, in accordance with Part E, Item 14 of the Water Licence.	
QIA-62.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 8 of 30			New	A detailed fish habitat assessment be completed and submitted for review prior to this location being used for water taking.	Agreed. **Commitment**: A fish habitat assessment will be conducted at the alternate WS27.1c station if Baffinland seeks to use it during summer. Winter water withdrawals came be made offshore and depth measurements can be taken to ensure an environmentally protective water withdrawal during winter.	
QIA-63.1	• 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			New	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.	The referenced text in the EPP is dated and is superseded by the Environmental Guidelines for Water Crossing Repairs, Installations and Modifications in Appendix F of the SWAEMP. This guideline was developed jointly with the QIA. **Commitment**: Baffinland will update the EPP to be consistent with the above-mentioned guideline.	
QIA-64.1	• Environmental Protection Plan • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures			New	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.	Confirmed. These will be monitored to ensure fish passage during freshet and summer low flows.	

QIA-65.1	• Environmental Protection Plan • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures – page 44 of 85			New	Provide further details on mitigation measures to ensure that culverts >50 m do not become fish barriers.	Monitoring plans will include detailed sampling to confirm fish passage. Crossings that are not passable by fish may form part of the Fisheries Act Authorization (FAA) Application. The draft FAA Application will be shared for review and comment.	
QIA-65.2				New	Confirm if a monitoring program will be developed to ensure that fish are using and able to pass through these extended culverts.	Confirmed. A fish passage monitoring program will be developed. These details will be included in the Fisheries Act Authorization (FAA) Application. The draft FAA Application will be shared for review and comment.	
QIA-65.3				New	Please describe means by which longer culverts can be illuminated	The illumination of culverts is a potential mitigation if culverts are determined to be impassable. The feasibility of this option is being further investigated.	
QIA-66.1	Same as above			New	Provide the results of the fish passage potential for each culvert.	These details will be included in the *Fisheries Act* Authorization (FAA) Application. **Commitment**: The draft FAA Application will be shared with the QIA for review and comment.	
QIA-67.1	• Environmental Protection Plan Rev B • Section 4.7.3.3 Environmental Protection Measures			New	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?	The identification of spawning sites in proximity to construction work areas is not anticipated. No spawning sites have been identified during baseline studies. Arctic char are assumed to spawn in lakes or potentially in deep pools in rivers. The small lakes affected by the North Railway may require special construction work windows to avoid potential spawning areas.	
QIA-68.1	• Attachment 31 - Surface Water Sampling Program - QA/QC Plan • 5.2.2 River and Grab Sampling			New	Please clarify the exact procedure for sediment sampling.	The procedures for sediment sampling in streams are provided in Section 5.2 of the Sampling Program - QA/QC Plan.	
QIA-69.1	• Attachment 13 • Watercourse Crossings – Attachment 13.1 Phase 2 Proposed Infrastructure Interactions with Watercourses			New	Clarify which Table is the most up to date with the project interaction and corresponding watercourse, pond/lake.	An updated list of watercourse crossings and project interactions is provided in Appendix 4 of this response document.	Appendix 4 - Project Infrastructure Interactions with Fresh Water Streams and Ponds (NSC, 2021)
QIA-69.2				New	Update both tables to ensure fish habitat is correctly defined and include 'potential' habitat for Arctic Char and Ninespine Stickleback.	See response to QIA-69.1.	

QIA-70.1	• Aquatic Effects Monitoring Plan • Section 3.3.5 Benthic Invertebrates			New	Provide the full comments referenced above in the AEMP.	The QIA may be referring to the Minnow Recommendations presented in Appendix C of the SWAEMP (Appendix A are Baffinland's corporate policies). Appendix C is the Part 2 file (210917-2AM-MRY1325-Amend2-Applic-Att-28-AEMP-Part 2).	
QIA-71.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks			New	Baffinland commit to continuing to use TP as an indicator of changes in trophic status.	Baffinland has consistently included the analysis of total phosphorus (TP) in water samples collected at all lotic and lentic waterbodies under the AEMP. Total phosphorus will continue to be assessed as part of the AEMP Rev 2 water quality monitoring program to support the evaluation of changes in trophic status.	
QIA-72.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks			New	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.	Baffinland will continue to monitor concentrations of nutrients including total ammonia, nitrate, nitrite, Total Kjeldahl Nitrogen (TKN), dissolved organic carbon (DOC), total organic carbon (TOC), and total phosphorus in surface waters at all lotic and lentic water quality monitoring stations under the AEMP Rev 2. In addition to monitoring nutrient concentrations in water at all AEMP lotic water quality monitoring stations, Baffinland monitors chlorophyll a concentration at these stations as a surrogate for the assessment of phytoplankton abundance and as a basis for evaluating changes in trophic status. Furthermore, because benthic invertebrate communities are sensitive to nutrient enrichment, benthic invertebrate community monitoring conducted annually at all AEMP lotic systems (including Mary River at three areas upstream, and two areas downstream, of the primary mine camp STP discharge) provides an additional tool for assessing potential nutrient enrichment influences of the project on biota of lotic environments. The collective monitoring of nutrients, chlorophyll a as a proxy for phytoplankton abundance, and benthic invertebrate communities at AEMP lotic environments provides sufficient information (through weight-of-evidence analysis) for assessing nutrient enrichment effects and the tracking of potential changes in trophic status at lotic systems adjacent to the project. Therefore, based on the ability of the AEMP to assess and track changes in trophic conditions at lotic stations, Baffinland deems	

						that additional phytoplankton or periphyton sampling in lotic systems is not warranted.	
QIA-73.1	• 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			New	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.	Baffinland regrets that the information presented in Table 3.8 related to the sampling of phytoplankton at Mary River G0-09-A, G0-09, and G0-09-B reference stations was misrepresented. Phytoplankton sampling (based on using chlorophyll a as a proxy for phytoplankton abundance) will be included as a monitoring component of the AEMP at Mary River G0-09-A, G0-09, and G0-09-B stations. Table 3.8 will be updated accordingly. As outlined in the response to QIA comment #72.1, the sampling of nutrients, phytoplankton (chlorophyll a), and benthic invertebrates at the G0-09 series stations is deemed by Baffinland to be sufficient for evaluation of project-related enrichment and trophic status effects. Therefore, no additional measures of phytoplankton or periphyton are required at lotic stations under AEMP Rev 2.	
QIA-74.1	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			New	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.	The maximum depth attained in Sheardown Lake SE is approximately 14 metres (m). The depth throughout the majority of this basin of Sheardown Lake (i.e., >95%) is estimated to be less than 12 m deep, which was the cut-off depth assigned to distinguish 'littoral' from 'profundal' lake stations under the CREMP. Therefore, a minimal amount of profundal habitat occurs in Sheardown Lake SE, and that which is present is at the threshold between classification as littoral or profundal. Hence, no 'profundal' stations are proposed for sampling in Sheardown Lake SE. Figure 3.3 provided in the AEMP Rev 2 will be updated to reflect no profundal stations sampled in Sheardown Lake SE. It is noteworthy that the five stations proposed for sediment sampling in Sheardown Lake SE under the AEMP Rev 2 have been evenly distributed throughout the lake and reflect depths ranging from approximately 6.8 to 13.2 m, the later of which is within the deepest portion of the lake. Therefore, although no profundal stations are included at Sheardown Lake SE for sediment sampling, the proposed design considers proper spatial coverage and variable water depths to ensure that sediment sampling conducted at Sheardown Lake SE meets the AEMP objectives.	

QIA-75.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 2.4.5.3 Tote Road and Northern Railway (WMA 48)			New	Provide further details on the anticipated discharge location, the monitoring site label, the parameters to be sampled and the frequency of sampling.	The temporary ore stockpiling area at KM57 was removed from the Project. References to this component were removed from the Updated Water Licence (Main Report). That reference to this project component was not removed from the AEMP is an oversight. It will be removed from the next revision of this plan.	
QIA-76.1	• 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			New	Confirm that fish ageing structures will also be aged by an accredited laboratory with expertise in processing fish ageing structures to confirm technician results.	Baffinland confirms that fish ageing will be conducted at a qualified analytical laboratory by personnel specialized in processing and ageing of fish using scientifically accepted approaches. As part of the quality control process, Baffinland confirms that a second qualified fish ageing specialist will be used to independently evaluate ages provided by the initial specialist. The age confirmation samples will be selected at random, with a total of 10% of the number of samples submitted undergoing a second, independent analysis. Results within one year of the original age estimate will be considered acceptable.; In the event of discrepancies, additional (secondary) age structures will be assessed by each ageing specialist to arrive at an assigned age for the sample(s) in question.	
QIA-77.1	• ICRP – 1. Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 13			New	How will feasibility of restoring natural drainage be assessed as reasonably possible or not and how will the decisions be documented?	The feasibility of restoring natural drainage will be determined by a Professional Engineer based on the level of disturbance that is required to re-establish natural drainage, and which drainage (project or natural) will be most physically stable in the long-term. The proposed approach will appear in design drawings supporting closure.	
QIA-77.2	• ICRP Section Plain Language Summary			New	What factors will be considered and what would prevent re-establishment of natural drainage at closure?	See response to QIA-77.1.	
QIA-78.1	• ICRP Section Plain Language Summary • PROJECT AND CLOSURE SUMMARY			New	Please clarify the number of quarries in the Phase 2 project.	Thirty aggregate sources (29 rock quarries and one borrow pit) are proposed to support Phase 2 construction (Section 2.7 of the Updated Application Main Report). An additional 79 quarries were previously identified to support construction of the South Railway and Steensby Port.	
QIA-78.2	• ICRP Section Plain Language Summary • PROJECT AND CLOSURE SUMMARY			New	How many are anticipated to remain as visible landforms following closure?	It is likely that some evidence of each quarry will be apparent at closure. How visible a landform each will be at closure will depend on quarry designs, to be presented in the quarry-specific management plans, and whether and	

						the degree of use for disposal of soil spoils during construction.	
QIA-79.1	• 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			New	In the event that refinements do not reduce risk to acceptable levels, what mitigation options are available and when could they be implemented?	Section 5.2.1.5 of the ICRP (Attachment 30) states "It is currently anticipated that the discharge from the open pit will not require treatment (AMEC 2010). However, if treatment is required several effective technologies are currently available to manage metal leaching and/or acid rock drainage (ML/ARD). If ML/ARD were to develop, batch treatments will be carried out to adjust the pH and/or metal concentrations of the water in the pit so that it meets discharge requirements before overflow into the environment." Section 5.2.1.9 further states: "Although indications to-date demonstrate a low probability of ML/ARD, in the event that ongoing water quality modelling or field monitoring shows a trend toward exceedance of discharge requirements, then water treatment options will be determined and implemented. Details regarding theoretical treatment options are provided in the Life-of-Mine WRMP (Section, 3.6.4) and were considered for both metal and ammonia/nitrate removal. Theoretical treatment options for metals removal included: • Resins • Polymer Addition • Sodium Hydrosulfite Treatment • Ozonation • Biofilters-Sulphide Precipitation • Activated Carbon • Lime Precipitation Theoretical treatment options for ammonia /nitrate removal include: • Biological De-nitrification (for removal of both ammonia and nitrate) • Ion Exchange • Electro-Chemical Ion Exchange • Breakpoint Chlorination of Ammonia The timeline for implementation of mitigation measures would be determined as refinements to the model provide further information on the water quality issues that may or may not occur.	

QIA-80.1	ICRP Sect 5.2 p. 100 Permanent Closure and Reclamation Requirements			New	If docks are left in place but not maintained, are they likely to deteriorate over time?	Geotechnical analyses and monitoring of the docks at Milne Port will be undertaken prior to closure to confirm long-term stability and maintenance requirements (if any).	
QIA-80.2				New	How does this fit the Closure Objective of physical stability?	Undertaking geotechnical analyses and monitoring to confirm the long-term stability of docks at Milne Port is consistent with the Closure Objective of physical stability. It is incorrect to suggest that an absence of active maintenance will necessarily result in long-term physical stability issues for the docks at closure.	
QIA-81.1	• 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			New	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.	Research and studies on potential pit filling scenarios are ongoing. Baffinland maintains that as active mining at Deposit 1 remains a hilltop outcrop, no Open Pit has formed, and development of an Open Pit is still several years away, this should not preclude approval of the ICRP. As noted in Section 1 of the ICRP, "The Project's Interim Mine Closure and Reclamation Plan (ICRP) is considered to be a "living" document, which is refined regularly throughout the life of mine until a Final Closure and Reclamation Plan is achieved." Further refinements to potential pit filling scenarios will be provided as information becomes available.	
QIA-82.1	p. 10-6 Sect. 5.2.17 Uncertainties			New	Provide feasible mitigation and closure options for the open pit that address the need for chemical stability and acceptable water quality.	Theoretical treatment options to mitigate potential pit water quality issues at closure are presented in Section 5.2.1.9 of the ICRP. If a treatment option is deemed necessary, criteria for the selection of the treatment process will include feasibility, and its ability to address the need for chemical stability and acceptable water quality.	

QIA-83.1	ICRP Sect 5.2.1.9 Contingencies p. 107			New	Are the options provided feasible for batch treatment of the pit or for ongoing treatment of pit discharge at closure?	As noted, the treatment options provided in Section 5.2.1.9 of the ICRP are theoretical and are intended to provide a high-level summary of treatment technologies and approaches that could be implemented if required. In the absence of a clearly defined water quality issue that would require treatment, it is premature to determine details such as whether batch treatment or ongoing treatment would be feasible. Section 5.2.1.9 of the ICRP provides information on the timeline for future work on open pit water quality: "ML/ARD will be periodically reassessed as a potential issue in the future ICRP revisions and in the Final CRP. 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). Based results of this research, the ICRP will be updated to present a time frame for the potential development of ML/ARD conditions, if any, and discuss the impact of ML/ARD release on final closure identifying the need for ongoing monitoring, treatment, and potential mitigations." The cited Year 10 was based on the full production rate. Development of the open pit is currently still a number of years away.	
QIA-83.2				New	Does Baffinland foresee a scenario in which ongoing treatment of pit discharge is required over the long term at closure?	Baffinland does not anticipate that ongoing treatment of pit discharge will be required over the long term at closure. However, as discussed in Section 5.2.1.7 of the ICRP, there is uncertainty as to the long-term water quality in the open pit. Baffinland has committed to addressing this uncertainty within the Reclamation Research Plan and adaptive management during operations. The ICRP addresses the potential that treatment of open pit discharge could be required, such as in Section 5.2.1.9 where theoretical treatment options are presented.	

QIA-84.1	ICRP Sect. 5.2.2.1 p. 108 Waste Rock and Overburden Piles			New	Confirmation if the overburden be isolated and used to promote revegetation of disturbed sites at mine closure.	Overburden generated during stripping of the open pit will be stockpiled for use in the construction of a closure cover over the Waste Rock Facility. Natural revegetation will be promoted by scarification.	
QIA-85.1	• ICRP Section 5.2.2. Waste Rock and Overburden Piles • D.3 Reclamation Research Program - Waste Rock Stockpile Seepage/Runoff Water Quality, p. 303			New	What climate change scenarios have been considered in the modelling?	Climate change criteria used for modelling are from IPCC (2007). Baffinland has committed to account for climate change in the development of the thermal model for the waste rock stockpile (Appendix D.4 of the ICRP).	
QIA-85.2	Same as above			New	What sensitivity assessments have been made on rate and magnitude of permafrost and runoff?	Sensitivity assessments have not been conducted in regard to cover thickness to account for climate change, but it is not required given the conservatism in a 50 m thick cover. The proposed 50 m cover is an order of magnitude greater than approved cover thicknesses at other Nunavut mines based on the latest climate change predictions.	
QIA-85.3	Same as above			New	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.	Refer to Baffinland's response to QIA-85.2 regarding the level of conservatism in the currently proposed final cover thickness.	
QIA-86.1	ICRP 5.2.2.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 116			New	Was this predicted from geochemical modelling and testing?	The potential for acid rock drainage was identified in the initial testing as part of the WRMP (Baffinland 2014). This initial testing indicated a longer lead time to realization of acidic drainage than was observed in the field. Further geochemical testing was completed in 2019 (Golder 2019 in the Phase 1 WRMP, which is Attachment 32 of the Updated Application) that identified the presence of soluble sulphate materials and recommended modifications to the WRMP that account for the observed conditions and additional geochemical considerations. The latest WRMP presents an updated summary of the geochemical characteristics of the waste rock.	

QIA-86.2	Same as above			New	How has this development been considered in the closure planning?	Additional work has been completed to further characterize the geochemical characteristics of the materials including evaluation of soluble sulfate minerals and a review of waste deposition practices (Golder 2019). Thermal modelling was completed and the Phase 1 WRMP was subsequently updated (issued as Rev 3 in 2020 and issued as Rev B incorporating adaptive management in Attachment 32 of the Updated Application) to evaluate for the presence of soluble sulfate minerals, and the depositional strategy was reviewed and updated such that potentially acid generation materials are placed in thin lifts, away from the edges of the pile, to promote freeze-back such that acidic conditions do not develop in the pile or in seepage or runoff from the pile, both during operations, and in closure and post closure. Details of the measures taken are provided in Attachment 32.	
QIA-87.1	ICRP 5.2.2.6 PREDICTED RESIDUAL EFFECTS p. 119			New	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.	As noted in ICRP Appendix H (page 368), the mercury, selenium and silver concentrations adopted as source terms in water quality modelling were based upon laboratory method detection limits (only 2% of the data were above MDLs). Thus, the modelling is highly conservative. Baffinland's response to QIA-79.1 discusses available theoretical treatment options that could be employed for metals removal, if that was required.	
QIA-87.2	Same as above			New	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.	The Fresh Water, Sewage and Wastewater Management Plan includes a TARP for contact water that can be applied to closure and post-closure. However, at planned closure, Baffinland will have the benefit of significant experience mitigating adverse runoff from the Waste Rock Facility. This will provide guidance as to whether seepage concerns may occur at closure, and appropriate thresholds and responses.	

QIA-88.1	ICRP Sect. 5.2.5.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITION ICRP 5.2.8.5 p. 152 Issue / Concern "Dock infrastructure			New	Will infrastructure be removed from the site or disposed on site (i.e., in waste rock piles or open pits)?	Selection of the final disposal option(s) will be made after receiving input from the Mine Closure Working Group, the QIA, and other regulatory agencies and stakeholders. The selected options will be described in the Final Closure and Reclamation Plan.	
QIA-88.2	Same as above			New	What criteria will be used to determine fate and disposal?	Criteria used to determine whether non-hazardous materials are disposed of on-site or off-site will include: - space required/available in on-site landfills or other approved waste disposal locations - logistical constraints/level of effort required for on-site vs. off-site disposal options - cost of on-site vs. off-site disposal options - input from the Mine Closure Working Group	
QIA-89.1	ICRP 5.2.6.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 135 ICRP 5.2.6.5 p. 136			New	What community uses have been identified for structures that are >100km from any existing communities?	Specific community uses for remaining structures at closure have not yet been identified. As indicated in Section 2.4 of the ICRP, Baffinland has proposed to establish a Mine Closure Working Group (MCWG) to best incorporate considerations for post-closure land use of the Project site. Future discussions with the MCWG will include potential future uses for remaining structures at closure.	
QIA-89.2				New	Has Baffinland documented whether a community has specifically identified a need for the dock post closure?	Baffinland does not recall this being mentioned up to now. This will be a key point of discussion with the future Mine Closure Working Group.	
QIA-89.3				New	Have CIRNAC or the communities indicated any agreement to assume liability for the ore docks?	Section 5.2.6.2 of the ICRP states "Ongoing engagement with communities and discussions with QIA will occur to confirm an approach for the Tote Road and water crossings such that an acceptable level of liability exists for transfer of these remaining structures." Similar engagement and discussions will be held with communities and CIRNAC for the Milne Port docks prior to closure.	
QIA-90.1	ICRP 5.2.7.2 p. 144 and 5.2.7.5 p.146 Landfills			New	Confirm if the proposed depth of overburden cover incorporates predictions for a warmer climate to accommodate a deeper active layer over time?	**Commitment:** Baffinland will review whether or not climate change has adequately been incorporated into the landfill cover thickness, particularly in reference to the latest climate change models.	

QIA-91.1	ICRP 5.2.8.5. p. 152 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY			New	What are the proposed effluent criteria for closure and what is the predicted timeline to meet the criteria?	Closure water quality will need to meet Type A Water Licence effluent criteria, territorial/federal guidelines, MDMER, and/or site-specific risk-based criteria, as relevant to the specific project areas and components (Table 5.1, Closure Objectives, Criteria and Actions by Major Project Components). As indicated in Section 9.5 of the ICRP, an important detail of the post-closure monitoring program will be the clear distinction of what closure criteria will apply to which areas, such that an appropriate monitoring schedule is developed.	
QIA-92.1	ICRP 6.2.1.1. Land Farm Operation, p. 155			New	Explain why the CCME (2008) risk-based methodology may be preferable to guidelines that are specific to Nunavut?	Section 2.4: Application of Remediation Criteria at Contaminated Sites in the Government of Nunavut Guideline for Contaminated Site Remediation (Government of Nunavut, 2019) is based heavily on the Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2008). The three tiers of approaches provided in the two documents (Tier 1: Criteria-Based Approach, Tier 2: Modified-Criteria Approach, and Tier 3: Risk-Based Approach) are essentially identical. The guidelines provided in the Nunavut Guideline are not specific to Nunavut, and in fact the Tier 1 Guidelines in both documents are exactly the same. Both the Government of Nunavut and CCME guidelines provide information on when a modified-criteria or risk-based approach may be suitable. Per the Government of Nunavut guideline: - "In general, this modified-criteria approach is utilized in situations where site conditions, land use, receptors or exposure pathways differ only slightly from those assumed in the development of Tier 1 criteria." - "In certain circumstances, neither the criteria-based or modified-criteria approach may be suitable for a site because pathways of exposure, target chemicals, receptors or other site characteristics differ significantly from those used to develop these more generic approaches." This guideline notes that Tier 2 or Tier 3 approaches may be more suitable for large, complex or remote industrial sites.	

						The Tier 1 Criteria-Based Approach is the simplest approach for assessing hydrocarbon-contaminated soils following treatment in the landfarm. However, as noted in the Government of Nunavut guideline, Tier 2 or Tier 3 approaches may be more suitable for large, complex or remote industrial sites, so Baffinland may pursue these options, if necessary, in the future.	
QIA-92.2				New	What criteria would influence a decision to use the CCME protocol?	As noted in the response to QIA 92.1, the Tier 1, Tier 2 and Tier 3 approaches in the Government of Nunavut guideline are identical to those in the CCME guideline. Using a Tier 2 modified-criteria or Tier 3 risk-based approach would be considered if there were significant issues managing hydrocarbon-impacted soil in the landfarm using the Tier 1 criteria-based approach, such as if soil treated in the landfarm was not able to consistently meet the Tier 1 guidelines. The Tier 1 guidelines were developed based on generalized assumptions for site conditions, receptors, and exposure pathways, and some of these assumptions may differ slightly or significantly from the site conditions, receptors, and exposure pathways at the Mary River Project sites. Using a Tier 2 or Tier 3 approach would utilize site-specific information rather than generalized assumptions and would generate site-specific soil quality guidelines for the Project that are protective of human health and the environment.	
QIA-93.1	ICRP 7.1 SHORT-TERM TEMPORARY MINE CLOSURE – CARE AND MAINTENANCE p. 159			New	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.	Section 7.1 describes the activities that would be undertaken in a short-term temporary closure scenario. All of the specified activities are the minimum requirements in this scenario and will be executed.	

QIA-94.1	ICRP Figure 8.1 Final Closure Schedule			New	Confirm where and how will rails and ties be disposed. Will they be disposed of on-site or off-site?	Rails and ties are inert, non-hazardous materials and would be suitable for either on-site or off-site disposal. Final determination of the disposal location will be determined closer to closure in consultation with the Mine Closure Working Group. **Commitment**: Baffinland will update the ICRP to indicate that rails and ties will be removed and either recycled, shipped offsite to an appropriate facility for disposal, or deposited within an onsite landfill, the open pit or other approved repositories.	
QIA-95.1	• ICRP Pit Flooding • Also See QIA TC "Enhanced Pit Filling"			New	Which enhanced flooding scenario does the 10-year timeline assume and what are the associated sources and water withdrawal rates?	It is clearly stated in Section 9.2.4 of the ICRP that the 10-year timeline for enhanced pit filling was assumed solely for the purposes of devising a monitoring program. The 10-year timeline that is tentatively assumed in Section 9.5 was also assumed for the purposes of determining aquatic monitoring requirements at closure. No enhanced flooding scenario associated with the 10-year timeline has been developed. Further work will be undertaken on potential enhanced pit filling timelines. When further refinements of these potential timelines are available, sections of the ICRP where pit filling timelines had been assumed will be updated.	
QIA-96.1	ICRP Section 9.6 Environmental Site Assessment p. 190			New	Confirm which guidelines will be used in the ESA process and that the guidelines chosen are protective of the environment.	Tier 1 Guidelines provided in the Environmental Guideline for Contaminated Site Remediation will be used, however site-specific guidelines will be used if they have been developed during the life of the mine. Tier 1 Guidelines or site-specific guidelines (if available) are protective of human health and the environment.	

QIA-97.1	ICRP Appendix D1 Reclamation Research Program – Open Pit Water Quality p. 293			New	Describe what elements of conservatism in the pit water quality model result in the predicted water quality at closure.	Further details on the mass balance modelling are provided in Appendix H of the ICRP (FEIS Freshwater Quality Predictions). Factors that support the modelled water quality being highly conservative include: - The model assumes near-instantaneous mixing in riverine environments due to the discharge to receiving flow ratio, and no modification of indicators due to precipitation, speciation, attenuation, or degradation. (Page 366) - For several parameters sampled in the humidity cell tests, metals were measured at or below the analytical method detection limit (MDL) for a large proportion of samples. Generally, the MDLs are high relative to the selected water quality objectives (CCME PAL or SSWQOs). For these parameters, the values assigned were set at one-half the MDL (AMEC, 2012a). The 90th percentile calculated source term was influenced by predicted water quality results based largely on the non-detect results in the humidity cells for the following metals: mercury (Hg), selenium (Se), copper (Cu), arsenic (As), cadmium (Cd), chromium (Cr), silver (Ag) and thallium (Tl). Consequently, the modelled water quality for these parameters is highly conservative. (Page 368) - A similar issue with detection limits was identified in the baseline water quality dataset. Most sample results for several metals were reported as non-detect (measured below the MDL). In the baseline dataset, non-detect samples were conservatively set at the MDL. This contributed to overly conservative modelling results, i.e., when most results were reported at the detection limit, the calculated values were close to or even exceeded the Water Quality Objective (WQO). (Page 369) - Two notable parameters, mercury, and selenium, were calculated to exceed the respective WQO because of the high proportion of non-detects in both the baseline receiving waters and in the humidity cell testing. (Page 369) - It is expected that the effluent quality during mine operations will meet MDMER requirements for metals. It is possible that, during the latter portion of the mine, pH may	

						decrease below the lower limit of the MDMER (pH 6.0). The estimated water quality derived for the pit drainage includes allowance for acidic drainage from exposed potentially acid generating (PAG) rock toward the end of mine life. The quantity of this exposed rock and the data used in deriving this drainage quality is the subject of additional study. It has therefore been assumed that pH adjustment of the pit water will be required in the second half of mine life and into post-Closure. During Operations, pH adjustment will most likely be carried out inside the pit before the water is pumped to the East Waste Rock Pond. Again, humidity cell testing is expected to over-estimate the runoff quality. These modelling results are very conservative and will be reviewed once data are available from recently initiated neutralizing potential-depleted humidity cell testing. This will improve confidence in drainage water quality and pH. Although the pit water quality source term for the latter part of mine life is beyond the MDMER range for pH and may require minor pH adjustment, the source terms (assuming no treatment) have been applied in the water quality modelling as a conservative measure (page 370).	
QIA-97.2				New	Describe the origin of the conservative model inputs and compare with realistic measured values.	As noted in the response to QIA 97.1, metals were measured at or below the analytical method detection limit (MDL) for a large proportion of samples in both humidity cell tests (used to generate source terms) and baseline water quality samples in the receiving environments. In these cases, values assigned were set at one-half the MDL for the humidity cell tests and were set at the MDL for the baseline dataset. These are conservative assumptions as they are based on realistic measured values which were in many cases below the MDL. Estimates for pit water quality assume that during the latter portion of the mine life, pH may decrease below the lower limit of the MDMER (pH 6.0). It is therefore assumed that pH adjustment of the pit water will be required in the second half of mine life and into post-Closure. However, the source terms applied in	

						the water quality modelling assume no treatment as a conservative measure.	
QIA-97.3				New	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.	Further modelling of pit water quality conditions will be completed as part of additional research as described in Appendix D of the ICRP (Reclamation Research Plans).	
QIA-97.4				New	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.	See response to QIA-97.3.	
QIA-98.1	ICRP Research Task – Pit Lake Meromixis p. 297			New	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.	Baffinland continues to include a meromixis research program in future plans for closure research. Discussions with experts has identified a need to collect meteorologic data from the top of Deposit 1 to inform future modelling on meromixis of the Pit Lake. Baffinland will be investigating strategies to collect this data given the harsh conditions atop Deposit 1 that can impact instrumentation in this location.	
QIA-99.1	ICRP Research Task Open Pit Water Quality Research Results p. 297			New	What geochemical tests have been completed on the ore body to date?	Geochemical testing completed to date is summarized in Section 2.4.2 of the Phase 1 WRMP (Attachment 32). A more detailed discussion is provided in Appendix B of the Phase 1 WRMP, specifically in Appendix A1 of the Appendix B document.	
QIA-99.2				New	Provide the status of any humidity cell tests on ore characteristics.	Humidity cell tests have not been conducted on the ore. The focus of geochemical testing including humidity cell tests is the waste rock that will be left behind. This is standard practice in characterizing mine wastes. A summary of humidity cell testing of waste rock is provided in Section 2.4.2 of the Phase 1 WRMP (Attachment 32).	
QIA-99.3				New	Compare the above results to the inputs to the pit lake model and comment on the conservatism of the pit water quality model.	The historical geochemical testing and humidity cell tests were used to generate source inputs for the pit lake water quality model. As described in detail in the response to QIA 97.1, the use of these results contributes to the conservatism of the water lake water quality model.	
QIA-99.4				New	What existing results could be used to test the conservatism of the water quality model?	As no pit lake currently exists, there are no existing results that can be directly correlated to future pit water quality. Existing results are available for water quality in runoff from the Waste Rock Facility, and it is instructive to look	

						at how these results relate to the pit water quality model. Elevated concentrations of some metals have been observed in runoff from the Waste Rock Facility that were not in agreement with observations from historical humidity cell test. As a result, an additional geochemistry program was undertaken in 2019 as described in Appendix A1 of Appendix B to the Phase 1 WRMP (Attachment 32). Section 5.0 of Appendix A1 provides a comparison of the results from the 2019 geochemistry program to historical geochemical data (that has informed the development of the pit lake water quality model). This section concludes that "*All the historical dataset is from areas outside the current Deposit 1 mining area with some samples from within the planned 2021 expansion. The differences in the geochemical results between the 2019 blasthole data and the historical suggests that Non-AG material with stored acidity may be limited to the current area of Deposit 1*." This suggests that existing water quality data for runoff from the Waste Rock Facility is not indicative of what will occur when the pit lake is developed.	

APPENDICES

APPENDIX 1: PHASE 2 PROPOSAL COMMUNITY FEEDBACK REGARDING WATER

November 1, 2021

MEMO

Phase 2 Proposal Community Feedback Regarding Water

Water-related Community Engagement

Concerns from the five most affected communities have been received during the Information Requests, Technical Comments and Final Written Responses during the NIRB review process. All concerns have been carefully tracked and are being addressed through commitments listed in the Commitments List. There were no comments/concerns related to Water (excluding Marine) submitted by hamlets or HTOs of the five most affected communities.

Table 1 below lists all the comments/concerns provided to NIRB related to water.

Key Concerns

The following concerns were expressed during the NIRB review process with respect to water:

- Ore dust, dust from blasting, and sewage effluent entering watercourses and affecting the water quality
- Potential for acid rock drainage from materials that are mined and stockpiled
- Concern that local waterbodies will be unacceptable for drinking water or may affect fish health
- Community member told the water around the mine isn't safe to drink
- Lakes around mine are red in spring and people still use the lakes and rivers to drink
- Water quality monitoring and reporting of results
- Questions regarding erosion and sediment control measures being employed at the site

Baffinland Commitments Related to Water

Through the review process, Baffinland made a number of commitments related to water. These are presented in Table 2.

Attachment 1

Tables

Table 1 Community Comments Related to Water

Date	Subject	Communication Summary	Stakeholder	Communication Method	Stakeholder Comment	Baffinland Response
Aug 30, 2018	Surface Water Quality	Monitoring for ARD was discussed. It was noted that there are geochemical test on rocks in the waste piles and treated if necessary. Dust monitoring was also noted in relation to water quality. Monitoring programs to date; however, have not shown any changes to water quality, TSS, etc. Additional monitoring and mitigation was discussed related to dust in lakes potentially affecting water quality.	MHTO, Pond Inlet	In-Person / Face-To-Face	Boasie – I would like to know how acid rock drainage (ARD) is managed Connor – some rock has sulphides and that can generate acid under the right conditions, we do geochemical tests on the rock in our waste rock stockpile to see if it has sulphides and could be acid generating. Some rock in our waste rock pile is potentially acid generating (PAG) and to manage acid rock drainage (ARD) we have ditches surrounding our waste rock stockpile to make sure any water that has contact with the PAG material goes to a pond that is treated Megan – it's important to note that ARD only happens under the right conditions – heat, air, water – and that its naturally generating, it's not because of a residue from the explosives used to blast the rock, sulfur is a natural element in the environment Connor – to manage ARD, we have to remove one of the ingredients – heat, air, water – so we encapsulate our waste rock stockpile with non-potentially acid generating rock (NPAG) and let it freeze Elijah – is it good for batteries? Group – no Elijah – does the dust get into lakes through streams close to the project? Megan – we have a water monitoring program to determine how much dust is getting into streams and if it's changing the quality of the water Elijah – could this could contaminate other lakes and make it undrinkable? Megan – you're right, the water systems are connected and they can transfer contaminants, but our monitoring program hasn't shown any changes to water quality, TSS, etc. in the areas where you think you would be most likely to see effects Billy – do you take samples from the lakes BIM takes drinking water from? Megan – yes we do sample our water intake lakes, and we do have a water treatment system to be compliant with regulations, meaning we would have the treatment regardless of the lakes interactions with dust fall Billy – can that filtering system used to clean the rivers? Megan – the filtering is only done for water brought into camp, the entire lake is not treated Billy – it would be beneficial to filter all the water going to the lakes from the streams receiving the dust Megan – the dust is not making the mine sites water undrinkable, Leo – there are areas up to 25km's away from Milne Port where prevailing winds (blowing west) are dropping dust and turning the snow a pinkish red Megan – we don't have dust collectors in that area but we have discussed doing some photo reconnaissance to try and confirm if it is dust and how to continue monitoring and managing it Billy – what we want to know is will the dust be managed at the Port? Levi – what way does the wind blow? Megan – the wind runs parallel with the road which is why we have dust collectors on either side of the road	

Jun 12, 2018	Surface Water Quality	Reporting results of water quality	Hamlet of Pond Inlet, HTO - Mittimatalik/Pond Inlet	In-Person / Face-To-Face	You mentioned that you sample the water, have you seen anything that you haven't expected, will you be informing us about what you found when you monitor the water quality. Thank you for that question, we do test every single year of water and sediment, we haven't seen any changes in water quality or sediment around the site or in the marine environment. All of our results are publicly available, and Baffinland posts them on our website so that they can be seen. We also present our findings in our environmental working groups which have QIA, government agencies and Pond Inlet HTO members on them. We look for feedback from these groups to identify any changes that need to be done. In regard to sharing with the community, we provide all monitoring results to the HTO. Last week we talked about better ways to share information with the community. Right now, we provide reports through email to the HTO and we ensure that there are summaries of all the reports that are translated into Inuktitut, and we talked about Baffinland coming into the community and delivering hard copies of the results and going through the results of these monitoring programs in the community. So that the community can be better informed and ask more questions about the monitoring.	Thank you for that question, we do testing every single year of water and sediment, we haven't seen any changes in water quality or sediment around the site or in the marine environment. All our results are publicly available, and Baffinland posts them on our website so that they can be seen. We also present our findings in our environmental working groups which have QIA, government agencies and Pond Inlet HTO members on them. We look for feedback from these groups to identify any changes that need to be done. In regard to sharing with the community, we provide all monitoring results to the HTO. Last week we talked about better ways to share information with the community. Right now we provide reports through email to the HTO and we ensure that there are summaries of all the reports that are translated into Inuktitut, and we talked about Baffinland coming into the community and delivering hard copies of the results and going through the results of these monitoring programs in the community. So that the community can be better informed and ask more questions about the monitoring.
Jun 11, 2018	Surface Water Quality		Clyde River	In-Person / Face-To-Face		Potential effects we are looking at and assessing at Milne Port include changes to water and sediment quality in Milne Inlet, loss of habitat, disturbance to marine mammals, and increased dust from larger stockpiles. Mitigation measures proposed to offset changes include installing silt curtains, construction methods, and bubble curtains to minimize underwater noise. Where the ore dock is going, we will have to go through a process called offsetting habitat. As a result of putting the dock there, we must offset the habitat somewhere else to achieve 'no net loss' of habitat. Marine mammal observers will be used during all construction activities and moving crushing indoors will reduce environmental dust. As part of current operations, we are already monitoring all these issues.
Jun 07, 2018	Surface Water Quality	Safe drinking water concerns.	HTO - Mittimatalik/Pond Inlet	In-Person / Face-To-Face	Jayko: You mentioned no harmful chemical. We are worries about drinking water. There are lots of lakes from Mary River to Milne. We would like a report to show all of the drinking water back to the HTO? Are the lakes safe to drink from?	Megan: Yes, the water is safe to drink. We use guidelines to measure what is in the water is safe for fish and for drinking. Although the iron in the water may alter the look or taste, it is completely safe to drink.
Nov 22, 2016	Surface Water Quality	Question about: sewage effluent quality monitoring. Response: review of effluent monitoring program provided.	Hamlet of Pond Inlet	In-Person / Face-To-Face	The one that goes to the lake – do you check it?	At the mine site we have a very detailed monitoring program. It's called the aquatic effects monitoring program that tests all the lakes in the area, this program is in addition to the requirements of the water license.

Jun 07, 2019	Surface Water Quality	Hall Beach concerned about iron reaching lakes	Hamlet of Hall Beach	In-Person / Face-To-Face	Jayko: Want to ask about dust. When the iron ore turns into dust, the wind blows it and we know that some of the dust has reached lakes. The dust that goes to the water, is there any chance of the dust turning into rust in the water?	Megan: The reason as to why the Mary River project is so enticing to investors is because of the high grade of the iron ore. Once you start crushing or handling it, wind does move the dust. In terms of rust build up, there is a discoloration that happens, but for the most part the iron will stick to other particles. The colour of the water may not change, but you may see sediment in the water. In terms of the ecological impacts of this dust, as I mentioned iron is a nutrient that animals and wildlife need. In order for it to be toxic to humans, you need a large amount of iron. It won't affect the quality of drinking water.
Jan 17, 2019	Surface Water Quality	Members state they are concerned about spills from trucks going into water	Arctic Bay	In-Person / Face-To-Face	A: spills from trucks, etc.	• *BIM presents Risks to the Terrestrial Environment • Impacts on lakes (water) o High • Effects on char o Medium impact • Runoff water o What are you concerned about getting/going into the water? o Seen as a high risk if pollution gets into the water.
Nov 23, 2016	Surface Water Quality	Question about: waterbody shown in a photo in the presentation. Response: overview of the water protection procedures at the site.	Arctic Bay	In-Person / Face-To-Face	The fence in the picture, next to stockpile. Is the water a lake or a creek. Is it to protect the lake? Does it flow into the ocean?	What this is showing is a silt fence that is capturing really fine particles in the water to prevent the particles from going into the creek. The creek is not flowing directly into the ocean. It flows into a lake and then into the ocean. This is a very long process so the sediment will settle out before it reaches the ocean. It does not directly protect the people. It is meant to protect the fish and the ocean. It is not used to catch fish.
Nov 23, 2016	Surface Water Quality	Question about: water protection procedures. Response: overview of water protection procedures at the site.	Arctic Bay	In-Person / Face-To-Face	Does it flow into the ocean? Does it prevent the people from being contaminated?	The photo is showing a silt fence. Is to trap the sediment in the water before flowing into the local creek. The fence is to trap the dust, before it goes into the creek.
Nov 22, 2016	Surface Water Quality	Question about: discharge of treated sewage effluent. Response: review of treatment facility provided.	Hamlet of Pond Inlet	In-Person / Face-To-Face	The sewage thing for the human waste – does it get put in the water or does it go somewhere else.	The treated sewage runs into a ditch that runs into Mary River, and at the port it runs overland to Milne Inlet.
Nov 22, 2016	Surface Water Quality	Concern about: effects of dust, especially on quality of freshwater resources. Response: welcome additional information about the effects of the Project on the environment.	Mathias Qaunaq	In-Person / Face-To-Face	When I was up there in the spring, we collect water from the brooks. It was covered with red dust, they should be white, but they were covered with red dust. where the hunter's cabin is by the port. We draw water from the creek in behind this cabin. HTO would like to be brought along to show BIM where the creek is and where the dust has been found.	Next time we are here we would like to hear about the letter that was written from you about the caribou. The chair had written a letter before about the caribou, but it was not approved by the board. We have decided as a group that we would write a new letter.

Nov 21, 2016	Surface Water Quality	Clyde River interested to learn how drinking water is treated at Mary River, for reference to Clyde River.	Clyde River	In-Person / Face-To-Face	What do you use to treat the drinking water? I just wanted to ask because we have issues with our water and wanted to learn from your systems.	Baffinland responded that the technical details of the treatment plant are not known by this team.
Oct 05, 2016	Surface Water Quality	Concerned about Dust affecting surface water quality.	z - M - 25-34 - IG	Survey/Questionnaire	Yes. Iron ore spreading rough rivers. Make dust control on rivers.	Are you concerned about how the Project is affecting the environment (e.g. air quality, water quality, noise, wildlife, fish)? If yes, what are you concerned about, and do you have any suggestions on what Baffinland can do about it?
Oct 05, 2016	Surface Water Quality	Concerned about surface water quality affected by the Project.	z - F - 35-44 - HB	Survey/Questionnaire	Yes. Concern about clean water, fish & caribou	Are you concerned about how the Project is affecting the environment (e.g. air quality, water quality, noise, wildlife, fish)? If yes, what are you concerned about, and do you have any suggestions on what Baffinland can do about it?
Oct 05, 2016	Surface Water Quality	Effect to water quality, changes to water and fish, questions about wastewater disposal	z - M - 18-24 – CR z - M - 35-44 – PI z - M - 65-74 – PI z - M - 65-74 – IG z - M - 45-54 - CR	Survey/Questionnaire	Various responses: Yes, Our animals seems to be affected and the water seems to get some gas and oil from job site. Get some workers who can look after the equipment. YES, Water quality. Limit affecting animals/mammals. yes. Lot of fuel on the water and fish not the same anymore. Not too close to land, should be slower. Yes. What will be done for the wastewater, where is it going to go?	Survey question: Are you concerned about how the Project is affecting the environment (e.g. air quality, water quality, noise, wildlife, fish)? If yes, what are you concerned about, and do you have any suggestions on what Baffinland can do about it?
Jan 11, 2019	Surface Water Quality	Air emissions from blasting onto snow, running off into streams during snow melt		In-Person / Face-To-Face	I just want to talk about visualization that I had, the mountainside of the ore, of the blast, I often envision whether if it is blasted on top of the mountain, if the smoke from the blast goes in the air and then evaporates, and then goes on the land. I often think that the pollution from the explosion goes down into the ground, and during the springtime when the snow is melting, if it drains to some area, that it might affect the land. Like if you see a rifle or a bullet from the ammunition that you see, the powder, how will the smoke from the blast affect the environment? I don't believe in my mind what I am hearing. (Joe Tigullaraq rephrasing): The blast must produce a residue, he used the example of a bullet casing, so after you take a shot you can smell the burnt powder, so this residue would be mixed in with the dust. The dust may contain some residue from the blast.	When there is a blast onsite, and they do not happen frequently, approximately once a week, when that happens, there would be a plume of dust or smoke, but we don't see any of this falling further than 30 m from our project development area, we don't see a large area this affects outside of that. So, we do monitor the water quality in the area of the mine site, and today we have not registered any of the chemicals that are present in the explosives in any of the water bodies, we are not seeing any residue from them in the environment. So I understand your concern, I have seen many blasts at the mine, unlike black powder in bullets, the explosive we use is emulsion. When it is consumed it creates gases, which expand and break up the rock, if ever there is explosive that does not blow up for some reason, we will see that this happens in our monitoring, and will ensure it does not enter the environment. All water from the mine is tested and controlled.

Jan 10, 2019	Surface Water Quality	Effects on drinking water and fish. A desire to have key arctic char lakes near Milne Port monitored.		In-Person / Face-To-Face	I want to make a comment, we were told that we could not drink water from the lakes or the river anymore by the docks, because the river is flowing. How are the waters, we have fish in those lakes, I would like you to check on lakes and check on the river, there are 4 big lakes, they have lots of fish, when we see them, the fish are very healthy stock, and there's lots of fish, maybe too many, in one summer, because of the fish in those lakes, because we were told not to drink from those lakes anymore. I wonder how it is affecting the fish, if there is damage done there would be compensation or assistance. It is important that you monitor and check those lakes that are important to us. They are very close to Milne Inlet, I don't know how they are affected, if they have not done any studies, it is important that you do it soon, if you damage all the fish in that area that we depend on for our livelihood, I am looking for compensation, that's the only way we can deal with it if the water is damaged in that area. We saw something different this year, the birthing place of narwhals, that area had no whales whatsoever. When our research vessel checked the situation, they reported that nothing had been happening in the birthing place for a month. I can't say why, nobody knows with certainty. Why is it that you are not monitoring and researching the lakes and rivers? I need to say that you may end up compensating us. One goal is you want to build a railroad, people have lived there, I don't support Steensby Inlet expansion, they also have fish in that area, thank you.	Megan: Thank you for your comments and questions. We are aware that there was information circulating on site this summer that someone was told not to drink the water, I'm not sure exactly what happened and what was said, but I can say that the people who are qualified on site to speak to the quality of the water in the area did not say anything like that. We have environmental monitors on site, they are accessible, you can ask security on site if you want to speak to them directly and they can provide information, so that team that does the environmental monitoring did not say anything like that. We do in fact monitor the freshwater and marine environment, we do monitor the lakes, water and fish around the mine site, and I wanted to say that we have a water compensation agreement with the QIA, so if impacts were to occur or the quality of water were to be harmed, we have a compensation agreement set up with the QIA, where compensation would occur if there were any impacts. Richard: As Megan has indicated, there is what is called an environmental effects monitoring program, at the mine site looking at the lakes right next to the mine, Camp Lake and Sheardown Lake, right now monitoring has shown slight changes in the lakes but nothing harmful to fish. Fish need much cleaner water than humans do, so the environmental limits for fish are very low compared to those for drinking water. At Milne port there is a similar aquatic effects program at the dock area to detect changes around the dock, and no meaningful changes at the dock have been seen. So if there is no meaningful change right by the mine or the port, the project would not be affecting the waters further out. These monitoring programs are comprehensive, look at water quality 3x per year, sediment quality, changes in invertebrate communities (little bugs), and studying fish, so they look at all components of the aquatic environment. So they look if there are any technical changes to those components.
Jan 10, 2019	Surface Water Quality	Has mercury testing of fish been carried out?		Survey/Questionnaire	Scientific research was done in Milne Inlet by a researcher in 2018 summer and found mercury levels higher than safety standard to eat. Has Baffinland ever done relevant studies related to mercury levels in fish. If so has Baffinland ever find contaminants in Fauna.	
Jan 08, 2019	Surface Water Quality	Drinking water		In-Person / Face-To-Face	Thank you, we are in approval of what you are trying to do, we are seeing the progress every year, now because we are in approvals there are very few people in the maybe, because you are looking at MP instead of the railroad you want to build north and south, I was thinking maybe if south didn't have, maybe just to Milne port, I'm glad you are not going this way anymore, we heard this far out that	Around not being able to drink water, we are aware there was a miscommunication on site, that someone was told not to drink the water because it is contaminated, that was misinformation, so we do monitor the water and sediment, we looked into the individual that had the information, and it was misinformation, I think Joe has more info.

					hunters were told not to drink any water from the area, you do research on the land and the water, my question is... I believe you will have to increase employment, to get all the work done.	Joe: Thank you, Regarding water, they were told you cannot drink the water it has been contaminated, we checked into that, we found out that because a river, Mary River has a lot of iron ore content, very high content, so we were informed later drinking water from the river was dangerous, even before the mine came into existence, there was natural iron ore that had seeped through the water and was in the river and lakes so therefore the iron ore content was always an issue to drink. Even before production and exploration began it was a natural thing when you have a huge iron ore deposit, that water will be contaminated, an elder informed us (from Arctic Bay, oldest woman), she told us ever since her own childhood when she went hunting on the mainland around Mary River, as a child and young woman, the river was always high in iron ore content, so it was always a natural thing before exploration began. They were advised as children to watch the water because it could cause stomach aches. Also, around Mary River it was a natural thing long before exploration, that iron ore was present in the water. Even before exploration every began people who went caribou hunting or even looking for soapstone quarries, if they drew the water from the river, they would have extreme stomach aches and the runs, so it affected their health, I mention the names of the people that have been affected by drinking the water in the old days as oral history. Another person told the story how the water has always been said to be contaminated because of the iron ore content caused by nature, not by exploration or mining by Baffinland. Whether it is in Mary River or Milne Inlet, there were some CBC radio talks that the mining had caused the water to be so polluted it was no longer drinkable, that was one of the concerns raised by radio, but it has always been a natural order of things, with the high iron content in the area. They will talk about how they have always identified certain lakes and rivers that had high iron ore content. So, it has always been a well-known fact, so I want to state that it is part of the oral history of our elders that it was not caused by mining.
Jan 08, 2019	Surface Water Quality	Ore dust on snow at Milne Port, and needing to get water from the camp		In-Person / Face-To-Face	Thank you, this spring or probably inside the year well be visiting other communities, if you know our routes to the other visiting communities, they'll be people visiting relatives, if you could revise the roads you have and I also want you to know that we visit other communities and we camp out in Milne Port, we were told not to take any snow or ice, we'd have to go get water from inside the buildings, and we can't be sure about Milne Port, just want you to know about that (scattered applause).	

Jan 08, 2019	Surface Water Quality	Red dust on snow running off into local watercourses		In-Person / Face-To-Face	Thank you, someone asked earlier, and I'm concerned about the question, regarding the contamination of the water. Nature is changing, and it is being affected by dust and I know about this because I worked for the research centre for a while, and I learned about when it comes from the earth, it drops to the ground it contaminates the ground, when we were flying at 27,000 feet we could clearly see the road to Milne Port, we could see the red dust from the road, if you want I can give you copies nature isn't to blame, its Baffinland who is to blame, once it melts it runs to the rivers, streams, contaminating rivers, Mary River it goes right to Milne Inlet? And has research been done? We were told in 2007 our waters would all be researched before Baffinland starts. Have they done the research?	Megan: I will pass to Richard Cook Richard: yes the original studies have been fully completed for the Steensby operation to go ahead, the only thing left to do is to design the marine aquatic effects monitoring program, the baseline information has been collected at Steensby Port. Such a program is already in place at Milne. At Milne Port also, there has been fairly extensive marine monitoring programs in aquatic effects at the port that look at dust, ballast water discharge, as well as marine animals, those monitoring programs are underway, and haven't found any environmental effects, and these will be put at Steensby if and when it goes in. Megan: we can discuss after, I think a bit of your question is have things changed from the baseline, we have done studies in waters between Mary River and Milne Port and at Milne Port, so to do date we understood the baseline studies from studies from 2007 to 2013, and we started monitoring during operation, what we have seen to date in freshwater and marine environment we have not seen any changes or impacts to water or sediment quality. we are doing that monitoring and we have that baseline data to compare year over year.
Nov 28, 2018	Surface Water Quality	Community member told the water around the mine isn't safe to drink		In-Person / Face-To-Face	A comment was made to Enookie that the water isn't safe to drink is this true?	I am not sure entirely what happened, but I can say that whatever was said was a miscommunication. If this was said, it came from a person who would not be qualified to speak to the quality of water around the site. It is an unfortunate circumstance that happened, and I don't know all of the details and I don't want to put anyone on the spot but am happy to talk about it after.
Nov 28, 2018	Surface Water Quality	Lakes around mine are red in spring and people still use the lakes and rivers to drink		In-Person / Face-To-Face	The lakes around the Mary River area are red in the springtime and people still use the lakes and rivers to drink. They are monitoring the water on a regular basis; I have done monitoring before to determine if there is too much iron. There wasn't too much iron and one of the samplers drank it to prove that it wasn't harmful. We always get our drinking water from the lakes and rivers in that area. This is my report on water monitoring. There is always dust building up though and dust from the road is spread around. I am not sure what will happen when the railway is built, perhaps it will improve. I drank water from Mary River and Milne Inlet that is the way it is. We go to Tugaat lake for fishing and there are still lots of fish and they are fat.	
May 30, 2017	Surface Water Quality	There are some signs that state you cannot drink from the stream, how is Baffinland going to mitigate this?	Pond Inlet	In-Person / Face-To-Face	There are some signs that state you cannot drink from the stream, how is Baffinland going to mitigate this? As far as we know there is no restrictions on any drinking water. That being said if there are traditional places you get	As far as we know there is no restrictions on any drinking water. That being said if there are traditional places you get drinking water we would like to know, we try to monitor all freshwater.

					drinking water we would like to know, we try to monitor all freshwater.	
May 30, 2017	Surface Water Quality	Dust effects on water used for drinking	Hamlet of Pond Inlet	In-Person / Face-To-Face	Likes the idea that the crushers are being moved but is concerned about water being impacted from the Tote Road. Is the water safe to drink?	Dust is not dangerous, and the water is safe to drink. Operations is working to reduce the amount of dust on the road.
Jun 11, 2018	Water Crossings	Railway crossings	Clyde River	In-Person / Face-To-Face	Mitigations are proposed to reduce these potential impacts, one is the crossings to be developed in consultation with communities. They will be designed for safe passage by ATVs and snow machines, will have signage, and we will work with communities to ensure it is understood how to conduct a safe crossing. Where fish are present, stream crossings will be designed for fish passage. Culverts to be placed in those streams will be monitored. If needed, we will relocate fish during construction work, and replace any habitat that might be lost during construction. Dust suppression is to continue along the Tote Road, which will reduce dust into the environment and into streams. By moving to a rail we will see a significant reduction in dust from ore trucks on the Tote Road.	
Oct 05, 2016	Water Licence	Satisfied with Baffinland's compliance with the regulations and assessments	z - M - 35-44 - PI	Survey/Questionnaire	Attempting to follow Environmental impacts and water licensing.	Are there things Baffinland is doing well? If yes, what are they?
Feb 20, 2015	Water Licence	What is Baffinland’s confidence level that your amendment to the Water Licence would be approved?	Peter Ivalu	In-Person / Face-To-Face	What is Baffinland’s confidence level that your amendment to the Water Licence would be approved? The original Type A Water Licence was for the construction of Steensby Port and having up to 3000 people at the Port. The amendment of NWB Water Licence for Phase 2 will be marginal so Baffinland are not anticipating a large water licence amendment. This will only commence after the NIRB approval of Phase 2 Project.	The amendment of NWB Water Licence for Phase 2 will be marginal so Baffinland are not anticipating a large water licence amendment. This will only commence after the NIRB approval of Phase 2 Project.

Table 2 Commitments Related to Water Made During the NIRB Review

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
234	NEW	QIA	Atmospheric Environment	Response to Additional Questions	Baffinland will develop and fund a Community Based Monitoring (CBM)program out of Pond Inlet that is Inuit led to monitor the extent of visual dust in the Project Area as well as a snow sampling program The CBM program could include a combination of snow coring and visual observation collection, as well as geochemical and satellite imagery analysis. Baffinland has already commenced with a pilot program that included snow sampling at multiple locations in and around the Milne Port development area, and compared the metals concentrations against Health Canada established drinking water and aesthetic guidelines. A final report on this pilot program will be shared in an information package on dust Baffinland is preparing to submit with its response to questions through the Phase 2 review. The final report will include a next steps section specific to establishing the community-based component of this program, to be funded and administered by Baffinland until QIA is prepared to take over the program under the Inuit Stewardship Plan.	NA	DRAFT - Wording To Be Confirmed
202	QIA-42	QIA	Freshwater Environment	Post-Sept 2020 Technical Meetings	*In conjunction with project stakeholders, Baffinland will develop a Terms of Reference for a Freshwater Environment Working Group (FEWG). Respecting the heightened regulatory oversight in relation to the freshwater environment, the FEWG will meet on an as needed basis to discuss items to be agreed upon by members of the FEWG. In person meetings, if required, will be coordinated with the planning of Marine and Terrestrial Environment Working Group meetings, where possible. A draft Terms of Reference will be submitted for review by March 31, 2021.*	NA	DRAFT - Wording To Be Confirmed
201	QIA-42	QIA	Freshwater Environment	Post-Sept 2020 Technical Meetings	Baffinland collects and reports data on fish presence, catch per unit effort, and fork length from 30-60 crossing sites along the Tote Road annually. Baffinland commits to adding observations regarding physical condition of fish (e.g., lesions, injuries, activity level). Baffinland and QIA will determine an appropriate approach to analysis and development of a metric for monitoring fish health for the 2022 reporting period. The program will be evaluated every three (3) years to determine if monitoring locations may be reduced due to no observations of project related impacts.	NA	This commitment will be implemented post PC approval
200	QIA-41	QIA	Freshwater Environment	Post-Sept 2020 Technical Meetings	Baffinland is prepared to adopt a more precautionary moderate risk threshold for lake sedimentation. The current moderate risk threshold for lake sedimentation is 1 mm, adopted from the FEIS. Baffinland will adopt the lake sedimentation rate predicted in the FEIS of 0.54mm, which is about half the current threshold, at the moderate risk level. Exceedance of the 0.54mm moderate risk level will trigger additional study to validate the thresholds relative to impacts on arctic char eggs. A low-risk threshold of 0.15 mm will also be applied that will trigger corresponding low risk response actions. Data will be collected and reported in 2021 to characterize sediment grain size.	NA	This commitment will be implemented post PC approval
188	CIRNAC-01 NEW	CIRNAC	Freshwater Environment	Post-Sept 2020 Technical Meetings	CIRNAC requests that Baffinland commits to the providing the following information during the Water Licence Amendment process, subject to Nunavut Water Board requirements. i. Baffinland shall provide a heat balance and relationship of the heat generation associated with the exothermic reaction of PAG waste rock deposited and soluble sulphates and demonstrate that the current design of the waste rock facility will maintain permafrost conditions in the long term (closure and beyond). ii. Baffinland shall perform an oxygen balance of the waste rock facility and correlate it with soluble sulphates. This will provide understanding of the process of ARD generation and the performance of the waste rock facility.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
186	CIRNAC-03 NEW	CIRNAC	Freshwater Environment	Sept 2020 Technical Meetings	CIRNAC requests that Baffinland commits to the providing the following information during the Water Licence Amendment process, subject to Nunavut Water Board requirements.i. Baffinland shall develop reliable criteria for identification of PAG rock that clearly accounts for uncertainty in the 0.2% total sulphur threshold and the presence of acidic soluble sulphates upon projected life of mine tonnages of PAG and Non-Acid Generating (NAG) rock.ii. Baffinland shall incorporate these criteria, clearly stated ranges in projected life of mine PAG and NAG rock tonnages and the resultant necessary contingencies and methods of validation that need to be incorporated into engineering design, environmental monitoring and management strategies for the Waste Rock Management Plan and Interim Closure and Reclamation Plan. These documents are to be submitted for review during the Water Licence Amendment process, subject to Nunavut Water Board requirements.iii. Baffinland shall review the performance of these plans and provide evidence of the effectiveness of these plans by demonstrating compliance with the management measures and that the desired outcomes of mitigation are achieved on an annual basis.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license
184	ECCC-3 NEW ECCC-4 NEW ECCC-6 NEW	ECCC	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland will address ECCC's outstanding concerns, as identified in their letter to the NIRB on September 4, 2020, through the Nunavut Water Board Water License amendment process for Phase 2	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license
172	MHTO	MHTO	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland commits to work with the MHTO to achieve the objective of PC Term and Condition 48(a)	NA	Initiative under existing Project
160	QIA-01 QIA-02	QIA	Terrestrial Environment	Sept 2020 Technical Meetings	Baffinland is committed to having QIA's approval of the Interim Closure and Reclamation Plan (ICRP) prior to the NWB Public Hearing for Phase 2 Water License Amendments.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license
159	QIA-01 QIA-02	QIA	Terrestrial Environment	Sept 2020 Technical Meetings	Baffinland will be solely responsible for all railway and rail feature construction costs, and all associated maintenance, should Adaptive Management Plan measures be triggered and identify that a modification to the rail must be made in accordance with adaptive management principles.	NA	This commitment will be implemented post PC approval
155	QIA-20 QIA-21	QIA	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland has agreed to a process to work with QIA to consider waterbodies of heightened importance and a tiered approach to compensation in the Water Compensation Agreement Process.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water licensing
148	QIA-41	QIA	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland is prepared to adopt a more precautionary moderate risk threshold for lake sedimentation. The current moderate risk threshold for lake sedimentation is 1 mm, adopted from the FEIS. Baffinland will adopt the lake sedimentation rate predicted in the FEIS of 0.54mm, which is about half the current threshold. A low-risk threshold of 0.15 mm will also be applied that will trigger corresponding low risk response actions.	NA	This commitment will be implemented post PC approval
147	QIA-42	QIA	Freshwater Environment	Sept 2020 Technical Meetings	The commitment made under QIA 42 will be amended to reflect the following: Metrics on fish health (fish presence, catch per unit effort, fish length and fork length) are collected from 60 crossing sites along the Tote Road and reported annually to DFO, as well as in the Annual Report for Operations to the QIA and NWB, as well as the Annual Report for the NIRB. Baffinland already monitors water quality and sediment quality as part of the Tote Road Monitoring Program, and we commit to add observations regarding physical condition of fish (e.g., lesions, injuries). Baffinland and QIA will determine an appropriate approach to analysis for the 2021 reporting period.	NA	This commitment will be implemented post PC approval

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
146	QIA-42	QIA	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland commits to coordinating freshwater focused workshops to address specific freshwater issues. Baffinland does not support the implementation of a regular occurring freshwater working group.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license
145	QIA-42 MHTO HPI	QIA	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland commits to providing QIA, MHTO and HPI a copy of the comprehensive lessons learned report (for the Tote Road crossings) when it is sent to DFO as part of the Phase 2 FAA.	NA	This commitment will be implemented post PC approval
131	QIA-03 QIA-04 QIA-05 QIA-09 QIA-10 QIA-38 QIA-46 QIA-49	QIA	Corporate Environment	Sept 2020 Technical Meetings	Baffinland will support Inuit to conduct independent, proactive monitoring of the Project for the purpose of mitigating adverse impacts and enhancing beneficial outcomes in a manner that captures the direct experiences of Inuit. A project management plan (the Inuit Stewardship Plan) will be developed by QIA, with input from an Inuit Committee and an Inuit Social Oversight Committee made up of members from the five Project impacted Communities. The Inuit Stewardship Plan will have two separate but linked streams: • Culture, Resource, and Land Use Stream • Social Stream Each stream will include dedicated monitoring led by Inuit monitors: • The Culture, Resources and Land Use Monitoring Program, with a focus on gathering data from impacted communities and through direct observations of changes on the land, waters, ice and wildlife • The Social Stream will see impacted community members trained to gather information about impacts on community well-being Information from both monitoring streams, and input from the two Committees, will directly inform the Project management system. Baffinland will fund the ISP for the life of the Project. QIA will administer the ISP for the life of the Project.	NA	Implementation is ongoing, completion not required for environmental assessment purposes
128	QIA-20 QIA-21	QIA	Freshwater Environment	Sept 2020 Technical Meetings	Baffinland is committed, within the next year, to support an Inuit-led IQ study on water values in the Project-affected area, and to integrate the results into a revised water compensation agreement that establishes a tiered approach to compensation for substantial effects on water that increases compensation for impacts on waterbodies deemed by Inuit to be of heightened importance. In addition, a finding of a waterbody of heightened importance will increase the amount of monitoring focus such waterbodies receive, where a project impact pathway can be established. Monitoring will be carried out either through Baffinland's scientific monitoring or the new Inuit-led Culture, Resources and Land Use Monitoring Program.	NA	Implementation is ongoing, completion not required for environmental assessment purposes
126	DFO 3.10.1 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will provide a detailed water withdrawal plan that includes an in-depth risk analysis informed by site specific fish and fish habitat features for the waterbodies chosen for water withdrawal as supplemental information to water licensing and any DFO Request for Review submission.	NA	This commitment will be implemented post PC approval

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
125	DFO 3.10.2 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will conduct a thorough localized assessment on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment will include an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be an environmentally protective threshold. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO.	NA	This commitment will be implemented post PC approval
124	DFO 3.10.3 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will provide additional rationale/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO.	NA	This commitment will be implemented post PC approval
104	DFO 3.8 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will provide decision criteria and decision matrix for the selection of water crossing methods for fish bearing watercourses in support of any regulatory permit applications made to DFO.	NA	This commitment will be implemented post PC approval
103	DFO 3.9.1 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will analyze monitoring reports related to the Tote Road existing watercourses crossings and provide comprehensive lessons learned report (for the Tote Road crossings) that would include strategic analysis of what will be done differently to ensure the fish-passage issue will be mitigated, avoided and addressed. This report will be included as part of any regulatory applications made to DFO.	NA	This commitment will be implemented post PC approval
102	DFO 3.9.2 NEW	DFO	Marine Environment	Feb 2020 - Response to Updated Technical Comments	Baffinland will provide an updated hydrological assessment of proposed watercourses crossings that includes, but is not limited to, crossing selection and design criteria, flow rates, velocities and discharge, and fish passage. This content will be included as part of any regulatory permit applications made to DFO.	NA	This commitment will be implemented post PC approval
100	CIRNAC-05	CIRNAC	Freshwater Environment	Nov 2019 Public Hearing	Baffinland shall complete thermal modeling of the Waste Rock Facility and include the results in the Waste Rock Management Plan prior to the conclusion of Water Licence Amendment process, subject to NWB requirements.	NA	This issue is resolved for environmental assessment purposes and will be further addressed during water license
99	CIRNAC-07	CIRNAC	Freshwater Environment	Nov 2019 Public Hearing	Baffinland shall confirm the origin of elevated concentrations of aluminum, mercury and copper in Shake Flask Extraction test results for rock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries as part of water licensing. The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and implemented.	NA	This commitment will be implemented post PC approval; CIRNAC 2 NEW aligns with response to CIRNAC-07.
81	DFO-3.12	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
80	DFO-3.13.1	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval
79	DFO-3.13.2	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval
78	DFO-3.14.1	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval
77	DFO-3.14.2	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval
76	DFO-3.14.3	DFO	Freshwater Environment	Nov 2019 Public Hearing	Baffinland will include the requested information in the application for the Fisheries Act Authorization.	NA	This commitment will be implemented post PC approval
39	NRCan-02	NRCan	Terrestrial Environment	Nov 2019 Public Hearing	Baffinland commits to: · Implementing the recommendations to accommodate the 30-year design life provided in the project memorandum 'Analysis of Proposed Rail Line Cut Sections and Port Area Structures Considering a Mine Life of 30 Years' (Hatch, 2019) including those related to pile length embedment and number of piles required for foundations. · Continue to refine the thermal, stability and creep analysis incorporating new data collected during geotechnical investigations and from instrumentation along the railway corridor, along the Route 3 deviation alignment as well the rail alignments outside the rail deviation, to support final design of embankments and bridges. · Consider local factors (such as snow accumulation and presence of water bodies) in the 2D thermal modelling to support final design of embankments, cuts and bridges. · Establish instrumentation along the rail alignment, including along the Route 3 deviation alignment, prior to and during construction to improve characterization of baseline ground conditions, support final design, evaluate impacts due to construction and railway performance, and to inform the implementation of mitigation /maintenance measures when triggers are reached.	NA	This commitment will be implemented post PC approval
33	QIA-02	QIA	Terrestrial Environment	Nov 2019 Public Hearing	Based on input provided during the Crossing Selection Workshop from HTO participants representing Pond Inlet, Igloolik, as well as QIA and GN, the following modifications have been proposed for the design of the North Railway to aid in caribou crossing: • 30 level crossings to be installed at locations identified by community representatives during the workshop (subject to Transport Canada and Community Acceptance). • A smoother fill material (Type 8 - 6 inches or less in size) will be used along the entire railway embankment (change from Type 12 - 24 inches or less). • A gentler slope (1:2 ratio) will be used for all portions of the railway embankment between 2 and 4 meters (change from 1:1.5). • A gentler slope will be created at the edges of crossings to assure approach from any angle is safe. • 4 additional plate arch culverts will be installed in areas where the railway embankment is high enough to allow an underpass (10 plate arch culverts were already proposed at fish bearing water crossings, which may also serve to allow passage for terrestrial wildlife throughout the year).	NA	This commitment will be implemented post PC approval

ID#	FWS ID#	Intervener	Topic	Date/Venue	Commitment	Commitment Due Date	Notes
24	QIA-31	QIA	Corporate Environment	Nov 2019 Public Hearing	Regarding the North Railway, Baffinland is committed to providing a construction plan that indicates specific monitoring locations and site-specific conditions that would lead to additional monitoring locations, and what construction monitoring results would trigger additional monitoring during operations which will be provided through the water licensing and Commercial Lease. These monitoring programs are currently being incorporated into an update to the Surface Water and Aquatic Ecosystems Management Plan that will be provided to the Nunavut Water Board in advance of the NWB technical meeting on November 12-13, 2019.	NA	This commitment will be implemented post PC approval
20	QIA-41	QIA	Freshwater Environment	Nov 2019 Public Hearing	The Tote Road Monitoring Program will be expanded to include the future railway development, both in proximity to the existing Tote Road Monitoring Program locations and along the rail route deviation from the Tote Road. Baffinland has committed to long-term monitoring of water quality within the Northern Transportation Corridor with the Tote Road Monitoring Program to assess the potential for project-related effects on water quality. Until monitoring of water quality indicates the potential for the Project to have an effect on water quality, the expansion of monitoring to include sediment quality and biota in Phillips Creek is not necessary. Should impacts to Arctic char populations be identified through the AEMP studies, the source of these effects will be evaluated though review of all potential variables including sedimentation.	NA	This commitment will be implemented post PC approval
19	QIA-42	QIA	Freshwater Environment	Nov 2019 Public Hearing	Baffinland has committed to continue to address existing fish passage issues on the Tote Road, and to address fish passage issues on the railway during the design phase, with verification monitoring post-construction. Baffinland will evaluate fish passage along the alternative rail line but this may not be done before the November NWB technical meetings. This c is mainly an issue for the Fisheries Act authorization.	NA	This commitment will be implemented post PC approval
18	QIA-43	QIA	Terrestrial Environment	Nov 2019 Public Hearing	Baffinland has committed to conducting a desktop review of available data to evaluate the hydrological, geomorphological and sediment transport regime at the Project site.	NA	This commitment will be implemented post PC approval

APPENDIX 2: FRESHWATER WATERBODIES WITH UNIQUE VALUE AND/OR CULTURAL SIGNIFICANCE TO INUIT (KP, 2018)

November 30, 2018

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Dear Christopher,

RE: Mary River Project - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) requested that Knight Piésold Ltd. (KP) identify freshwater waterbodies with unique value and/or cultural significance to Inuit that occur on Inuit Owned Land (IOL) and have the potential to be affected by the Mary River Project. The Mary River Inuit Knowledge Study (MRIKS); (Baffinland, 2014) was identified as a key information source in this regard. This work will assist Baffinland in its interpretation of the Water Compensation Agreement (WCA) between the company and the Qikiqtani Inuit Association (QIA).

2.0 BACKGROUND

Article 20 of the *Nunavut Agreement* is titled Inuit Water Rights, and Section 20.3.1 states the following:

> *"No project or activity within the Nunavut Settlement Area which may substantially affect the quality of water flowing through Inuit Owned Lands, or the quantity of such water, or its flow, shall be approved by the NWB [Nunavut Water Board] unless the applicant for a licence has entered into a compensation agreement with the DIO [Designated Inuit Organization] for any loss or damage which may be caused by the change in quality, quantity or flow of the water or the NWB has made a determination in accordance with Section 20.3.2."*

Baffinland and the QIA signed a WCA in 2013, in accordance with Section 20.3.2 of the *Nunavut Agreement*, and Section 63 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. Section 20.3.3 of the *Nunavut Agreement* provides guidance in regard to determining compensation for loss or damage caused by the change in quality, compensation, or flow of water through IOL:

> *"In determining the appropriate compensation for loss or damage under Section 20.3.2, the NWB shall take into account the following:*
>
> - *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*
> - *the nuisance, inconvenience, disturbance or noise caused by the change in quality, quantity or flow of water to the person or group affected*
> - *the adverse effects of the change in quality, quantity or flow of water in combination with existing water uses*

- *the cumulative effect of the change in quality, quantity or flow of water in combination with existing water uses*
- *the cultural attachment of Inuit to Inuit Owned Lands, including water, adversely affected by the change in quality, quantity or flow of water*
- *the peculiar and special value of Inuit Owned Lands, including water, affected by the change in quality, quantity or flow of water, and*
- *interference with Inuit rights, whether derived from this Article or some other source."*

We understand that it is bullets 5 and 6 above (the cultural attachment and peculiar and special value of IOL including water) that Baffinland would like to identify in relation to the Project.

Overlap of the Project footprint with IOL is shown on Figure 1. Milne Port, the Mine Site, most of the Northern Transportation Corridor, and the northern 30 km of the South Railway is situated on IOL. As such, this review will focus on potential interactions of these project components with waters important to Inuit.

3.0 INUIT KNOWLEDGE STUDIES

Community based research programs were undertaken by Baffinland to obtain community input, socio-economic information, and Inuit knowledge. The MRIKS was conducted by Baffinland from 2006 through 2010 (Baffinland, 2014). Objectives of the study included obtaining local knowledge of wildlife, land use, and areas of cultural significance to support Project decision-making and the environmental assessment process. Inuit have a unique knowledge about their local environment, how it functions, and its characteristic ecological relationships. Inuit knowledge is recognized as an important part of project planning, resource management, and environmental assessment.

Workshops and interviews with elders were undertaken in the communities of Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet in 2007 and 2008, and workshops were held in the South Baffin communities of Cape Dorset and Kimmirut in 2010. The results of Inuit knowledge studies were incorporated to the Final Environmental Impact Statement (FEIS) report (Baffinland, 2012) and FEIS Addendum report (Baffinland, 2013) for the Early Revenue Phase (ERP). A database was eventually assembled that consists of research agreements, interview questions, audio recordings of interviews, written interview transcripts in Inuktitut and English, and the keyword summaries and maps that were the main products of the study (Baffinland, 2014). The study methodology is summarized in Appendix A.

4.0 METHODOLOGY

KP led the study and developed the study products, and hence has a familiarity with the MRIKS database. KP reviewed the database with the aim of identifying those waters that were identified as important to Inuit that may potentially be affected by the Project. A number of interview questions produced information on areas of importance to Inuit. This included questions regarding travel routes and camps, water, and areas important for fishing. The interview questions assessed as having information on the importance of freshwater bodies in the region are provided in Appendix B.

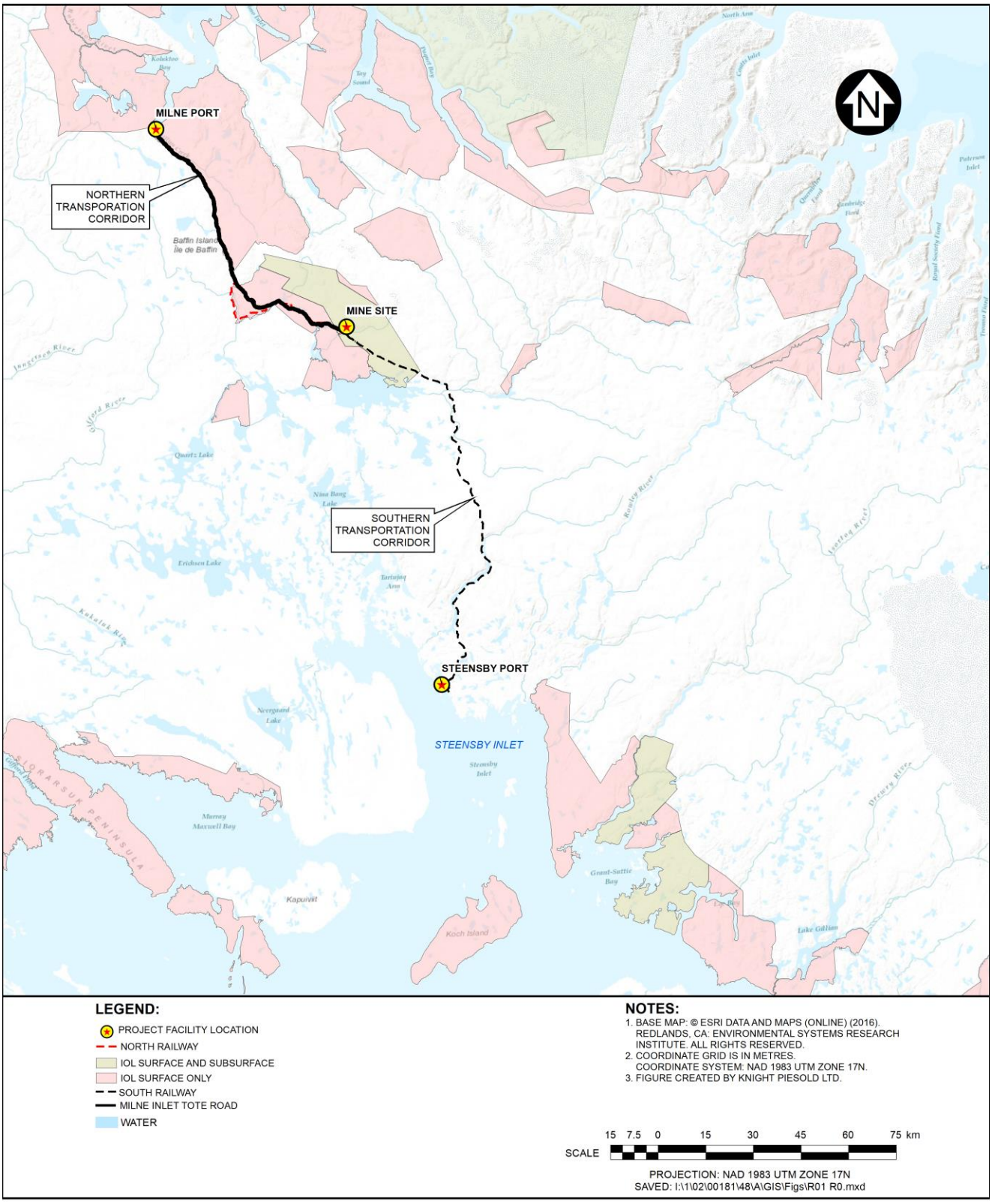

Figure 1 Project Location Relative to Inuit Owned Lands

In completing this review, KP undertook the following:

- Identified and reviewed the applicable maps that show the following information:
  - Camps
  - Travel routes
  - Lakes and rivers of importance
  - Special places and resource collection areas
  - Fishing areas
- Reviewed keyword summaries related to the above topics
- Reviewed individual transcripts corresponding to mapped features discussing lakes and rivers of importance

Relevant figures presenting the above information are included in Appendix C, as follows:

- Figure 1.4 Travel Routes - Project Study Area (Interview Results)
- Figure 1.6 Berry Picking Locations - Project Study Area (Workshop Results)
- Figure 1.8 Camping Locations - Project Study Area (Workshop Results)
- Figure 1.12 Special Places - Project Study Area (Interview Results)
- Figure 1.16 Stone Quarry Locations - Project Study Area (Workshop Results)
- Figure 3.20 Water and Ice Features - Project Study Area (Interview Results)
- Figure 5.2 Fish Locations - Project Study Area (Interview Results)

The results of the review are provided below.

5.0 RESULTS

5.1 THE IMPORTANCE OF WATER

A number of study participants stated that good drinking water was of primary importance for well-being, and water is also an important source of food (fish).

> *It's vitally important you get some water for drinking purposes. But, lakes are also important because when I go fishing to a lake and I stay there for a long time and when I become thirsty I can drink the water from the lake. Yea, there are a whole lot of lakes in this area here. For example, the residents of Pond Inlet we go to this lake to go fishing.* (PI-03, Pond Inlet)

Several elders emphasized the need to have a good water source near to camp sites.

> *We made sure to camp nearby water sources such as lakes, rivers and streams so we had water nearby our camp… This has always been one of the case for all time, when choosing a camp site, we had to be sure to have a water source nearby… Lakes and rivers are all important as we camp or live around those for our water source and we fish off the lakes and rivers during the run… Having water is essential to us and water keeps us alive.* (Elijah Panipakoocho, Pond Inlet)

> *We have always had to live nearby lakes for our water source and we even use it as storage or deep freeze with our meat supplies. This lake is where the river runs from where we fish. … These lakes are very, very important to me. Some campers camp where there are no lakes, and in early fall they have no water source at all, so it is important to live or camp nearby lakes.* (Ikey Kigutikkarrjuk, Arctic Bay)

While out on the land, hunters and travellers consume water from ice, snow, lakes and rivers. In winter, snow is relied upon as a water source. Water from glaciers was identified by many study participants as the best available water.

> *Only when you have good drinking water are you more livelily and when you don't have good drinking water it is unpleasant and you always look for a source of good drinking water… When you're at Qaurnak in the summertime and the icebergs arrive you have an excellent source of drinking water… When we were camping out there we had excellent drinking water. Water is very important to our livelihood.* (Jochabed Katsak, Pond Inlet)

> *Our waters are frozen for longer periods of time. There is a lot of snow that we can also use for water. They are clean as they are frozen more than half the time. Outside of the community there are lakes that have clean water. Lakes up here freeze often and there is an abundance of it to be used for drinking. There is a lot of that in our environment. We can get our water anywhere. We can either use ice or snow.* (AB-13, Arctic Bay)

The lakes and rivers are an important source of food, fish are caught from their depths and mammals are hunted from the water. During the open water period, major rivers are generally preferred over smaller watercourses, and in particular, rivers with a gravel bottom, with an awareness that smaller streams or streams with finer substrate (and hence lower flow) are more likely to contain harmful bacteria. Inuit commonly observe the water to see if it is foggy or murky, since it is believed that clear water is the best water to consume.

> *After there's no longer some ice we didn't just fetch water from ordinary streams but major rivers seemed to have better drinking water source and also rivers have little germs… we were discouraged from drinking from small streams or lakes. Only we were told to drink water from major rivers such as if the river had gravel bottom. That's a very good drinking water and everyone has known that for a long time… if it's for making tea then you can easily identify if it's poor source of drinking water and the tea tends to turn black and you can tell that it is not good drinking water by sampling the tea you can notice it right away so tea is an excellent source of identifying the quality of drinking water because they tend to turn black and then you know.* (Jochabed Katsak, Pond Inlet)

Tea is said to be a good indicator of water quality. Also, nowadays people reportedly boil their water before consuming.

5.2 PROJECT AREAS

Table 1 summarizes the Inuit land uses including the identification of important waters within the Project's development areas on IOL, as established by the mapping developed from the MRIKS (Appendix C).

Table 1 Geographic Areas with Cultural or Land Use Importance

Project Areas	Travel Routes	Camps	Water (specific locations)	Harvesting Food (specific locations)	Special Places (includes carving stone deposits)
Milne Port	Yes	Yes	No	No	No
Northern Transportation Corridor	Yes	Yes	No	No	No
Mine Site	Yes	Yes	No	No	Yes

A summary of the land uses and likely presence of waters of importance to Inuit is provided below for each of the Project Areas. Although the first 30 km of the South Railway is located on IOL, this area has been incorporated into the discussion on the Mine Site.

5.3 MILNE PORT

Milne Port is an important entrance into the interior of northern Baffin Island, mainly for the people of Pond Inlet. It is also along the main travel route between Pond Inlet and Igloolik (Figure 1.4). It is an area historically and currently used for camping (Figure 1.8). Important waterbodies were not identified at the port site as part of the MRIKS (Figure 3.20). Important waters nearest to Milne Port include the Robertson River system to the northeast, which drains into Koluktoo Bay, and the Tugaat River system to the east. Both these rivers are important for harvesting anadromous Arctic Char.

An old outpost camp is located on the beach at Milne Port to the east of Baffinland's port facilities. The camp was originally constructed during mineral exploration activities in the early 1960s, and while the building is in poor condition and not habitable, it continues to serve as a refuge for land users, and the area continues to be where hunters will land their boats, sometimes offloading all-terrain vehicles (ATVs) to travel inland. It is reasonable to assume that land users use the stream adjacent to the HTO cabin, though this stream beyond the influence of the Project.

Prior to development of Milne Port, hunters would also land boats at the mouth of Phillips Creek, anchoring them inside the sand spit that crosses part of the mouth of the river. The lowest reach of the river behind the sand spit has been found to be brackish and not suitable for drinking, though further upstream at Baffinland's approved water withdrawal location, the water is fresh with no evidence of salt intrusion. Baffinland's Hunter and Visitor Site Access Procedure (Baffinland, 2015) directs hunters to land on the east end of the beach in the vicinity of the HTO cabin mentioned above, and as such, presumably land users no longer land boats at Phillips Creek and depart inland from this location.

5.4 NORTHERN TRANSPORTATION CORRIDOR

Phillips Creek and the Milne Inlet Tote Road (Tote Road) is part of the corridor into the interior of the island, as referenced above (Figure 1.4), and a number of camp sites have been identified (Figure 1.8). No important waters were identified within the corridor (Figure 3.20). The lakes within this corridor were noted to support land-locked Arctic Char.

Given the amount of travel and camps found along Phillips Creek, as well as archaeological sites that demonstrate its historic use as a travel corridor, it is reasonable to assume that Phillips Creek and the lakes within the river system (i.e., KM26 Lake, KM32 Lake and Katiktok Lake) have been and may continue to be used by Inuit as a water source. As noted in Section 5.1, Inuit strategies to obtain good drinking water includes seeking larger waterbodies with gravel substrate, and hence it is unlikely that land users (at least experienced land users) would seek to obtain drinking water from the many small tributaries of Phillips Creek that are crossed by the Tote Road.

5.5 MINE SITE

Deposit No. 1 (Nuluujaak) is used as a landmark for navigation while traveling on the land, being about 500 m above the surrounding ground to the south, and highly visible from afar. It is removed from the main Pond Inlet to Igloolik travel corridor. Nonetheless, Inuit have traditionally traveled through the Mine Site area to reach lands further east via the Ravn River valley (Figure 1.4), or to hunt caribou or collect carving stone (Figure 1.16).

> *Yes …Hunters would hunt for caribou there as there would be a lot of caribou in early spring. I would be able to see Mary River from there. We knew Mary River all along as we would be able to see it from there. We weren't aware of the fact that it has minerals but the mountains would become visible and we could tell that it was Mary River. We knew where Mary River is but weren't aware that it has minerals in it.* (Sakiasie Qaunaq, Arctic Bay)
>
> *We used to go [to Mary River] to go pick up soapstone. We would take the soapstone to Pond Inlet. The soapstone at Mary River is good quality stone.* (Ipeelie Koonoo, Arctic Bay)
>
> *The only place that I know is at Nulujaak (Mary River) near the camp they had set up, up at the hill, in a gully there is some variety carving stones that some people quarried and stones for making pots can be found at Tuapak, and marble, Nallua has some marble.* (Calab Ootoova, Pond Inlet)

No important waters were identified in the Mine Site area, or along the first 30 km of the South Railway (Figure 3.20). Although not identified in the IQ studies (Figure 1.8), there was a cabin at the Mine Site, originally constructed as part of mineral exploration in the early 1960s, which was used by hunters until construction of the mine in 2013. At the start of mine construction, Baffinland replaced this cabin with a new cabin, positioned on the west side of Camp Lake near its outlet at the request of the Mittimatalik Hunters and Trappers Organization. Based on the location of the new cabin, Camp Lake is the obvious water source for camp occupants, at least during the period of open water. The outlet stream of Camp Lake is not expected to be used for water, as it is shallow with sometimes limited flow. Water could be withdrawn from the Tom River, which is similar in size to the Mary River, though it is further removed from the cabin. Snow is likely the source of water during periods of ice cover, which is much of the year.

6.0 CONCLUSIONS

The MRIKS (Baffinland, 2014) is a useful resource for identifying waters that are important to Inuit, i.e., with a cultural attachment and peculiar and special value. Though waters on IOL that are important to Inuit were identified from the study, none of the identified locations are close to the Project.

It is reasonable to assume, however, that watercourses close to areas used by Inuit may be used as sources of drinking water. This includes:

- The stream next to the HTO cabin on the east side of the Milne Inlet beach
- Phillips Creek and the lakes within the Phillips Creek catchment
- Camp Lake
- Possibly the Tom River

These watercourses are not thought to qualify as having a cultural attachment and peculiar and special value, as described in Section 20.3.3 of the *Nunavut Agreement*.

7.0 REFERENCES

Baffinland Iron Mines Corporation (Baffinland), 2012. *Mary River Project - Final Environmental Impact Statement*. February.

Baffinland Iron Mines Corporation (Baffinland), 2013. *Mary River Project - Addendum to the Final Environmental Impact Statement for the Early Revenue Phase*. June.

Baffinland Iron Mines Corporation (Baffinland), 2014. *Mary River Inuit Knowledge Study, 2006-2010*. Compiled by Knight Piésold Ltd.

Baffinland Iron Mines Corporation (Baffinland), 2015. *Hunter and Visitor Site Access Procedure*. February 17. Doc. No. BAF-PH1-830-PRO-0002, Rev. 1.

Knight Piésold Ltd. (KP), 2015. Letter to: Oliver Curran, Baffinland Iron Mines Corporation, Re: *Mary River Project's Inuit Knowledge Study Database*. February 6. Ref. No. NB14-00411.

8.0 CLOSURE

Please contact the undersigned if you have questions or comments about the content of this letter.

Yours truly,
Knight Piésold Ltd.

Prepared:

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Specialist Environmental Scientist | Associate

Reviewed:

Oscar Gustafson, R.P. Bio.
Specialist Environmental Scientist | Associate

Approval that this document adheres to the Knight Piésold Quality System:

Attachments:

Appendix A	MRIKS Study Methodology
Appendix B	Select Interview Questions
Appendix C	Select MRIKS Figures

/rc

APPENDIX A

MRIKS Study Methodology

(Pages A-1 to A-4)

APPENDIX A
MRIKS STUDY METHODOLOGY

1.0 INFORMATION SOURCES

Community based research programs were undertaken by Baffinland to obtain community input, socio-economic information, and Inuit knowledge. The Mary River Inuit Knowledge Study (MRIKS) was undertaken by Baffinland from 2006 through 2010. Inuit have a unique knowledge about their local environment, how it functions, and its characteristic ecological relationships. Inuit Qaujimajatuqangit (IQ) is recognized as an important part of project planning, resource management, and environmental assessment. In 2006, the study started in Pond Inlet. Workshops and interviews with elders were undertaken in the communities of Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet between 2007 and 2010. Workshops were held in the South Baffin communities of Cape Dorset and Kimmirut during 2010. The objectives of the IQ study were to obtain local knowledge of wildlife, land use, and areas of cultural value to support Project decision-making and the environmental assessment process. The results of IQ studies conducted from 2006 through 2010 were incorporated to the Final Environmental Impact Statement (FEIS) report (Baffinland, 2012) and FEIS Addendum report (Baffinland, 2013) for the Early Revenue Phase (ERP).

Research agreements were negotiated between each of the five North Baffin community working groups and Baffinland as follows:

- Pisiksik Working Group (Pond Inlet) - 2006
- Qaatiliit Working Group (Igloolik) - 2007
- Inuksuligarjuk Working Group (Arctic Bay) - 2007
- Tikkuu Working Group (Hall Beach) - 2008
- Ukkakkut Working Group (Clyde River) - 2008

These agreements outline the following:

- Roles and responsibilities of the parties
- Purpose and methods of the IQ study
- Clarification on matters of privacy, informed consent and ownership of data

IQ workshops were initiated to provide another source of community-based data, to help verify results from other data sources (e.g. IQ interviews, working group meetings), and to engage a broader community audience. Workshops on caribou, marine mammals and Inuit land use were conducted in the North Baffin and South Baffin communities to identify areas of importance and use to Inuit and to identify potential project interactions with these things. In the North Baffin, these workshops were structured to have both ‘public’ and ‘invited persons’ components. Workshop minutes were recorded for all meetings. In some cases, additional public outreach was made, in the form of radio call-in shows and staffed tables set up in public places (e.g., Co-op stores).

Baffinland has continued to consult with Inuit communities for the existing operations and Phase 2 Proposal. These discussions have not provided new information specific to the designation of new and/or culturally important freshwater waterbodies.

2.0 INTERVIEW QUESTIONS AND WORKSHOPS

2.1 METHODOLOGY

IQ interviews with elders were held in Arctic Bay, Igloolik and Pond Inlet over the period of late 2006 into 2008. Working groups identified the key knowledge holders in the community.

Interviews were carried out using a set list of interview questions. The Pisiksik Working Group developed an initial list of 168 interview questions based on an example provided by Knight Piésold from another Project. Questions focused on Inuit use and understanding of the land, caribou, marine mammals, fish, birds, and other land mammals. For Arctic Bay and Igloolik a shorter questionnaire was developed, containing only 83 questions. Questionnaires in Arctic Bay and Igloolik were shortened after it was recognized the Pond Inlet questionnaire was cumbersome and the length of interviews and subsequent transcribing was difficult for the interviewer and elder consultant to complete.

Interviews were recorded on either recordable mini-disc or by digital recorder and relevant information mapped at a 1:1,000,000 scale. The audio recordings of the interviews were transcribed into Inuktitut and then translated into English.

Data verification sessions were held in each of the three communities after all the interviews had been completed. During these visits, the interviewees were invited to review draft GIS IQ maps. Interviewees commented on the accuracy of the data that had been produced. Data features were deleted, added or modified on the maps to reflect interviewee wishes.

The types of data collection during interviews and workshops included marine mammals, caribou, land use, fish, birds, and other land mammals.

Land use data were collected during workshops in Arctic Bay, Clyde River, Hall Beach, Igloolik, Pond Inlet, Kimmirut and Cape Dorset, although only a selection of questions were asked in the South Baffin communities. Land use data were also collected through individual interviews with elders in Arctic Bay, Igloolik and Pond Inlet. Questions asked during the interviews and workshops pertained specifically to:

- Travel routes
- Camps
- Archaeological sites
- Traditional plant use
- Resource collection areas (including carving stone and berry picking areas)
- Ice and water conditions
- Special places on the land

Lines of questioning focussed on:

- Inuit land use (e.g. locations, uses of locations, stories and/or legends)
- Interaction of Project components with land use activities (e.g. location of Project components in regards to land use activities)

Fish data were collected during individual interviews with elders in Arctic Bay, Igloolik and Pond Inlet. Additionally, some fish data were collected during workshops in Kimmirut and Cape Dorset. Questions asked during the interviews pertained specifically to fish interviewees were familiar with. Lines of questioning focussed on:

- Life cycle activities (e.g. migrations, areas of concentration, spawning areas) of fish
- Inuit use of fish (e.g. harvesting locations, harvesting methods)
- Interaction of Project components with fish (e.g. ship traffic)

These questions were asked in an effort to better understand potential impact pathways and opportunities for mitigation.

2.2 MAPS

A number of maps were produced during both the IQ interviews and workshops. Sheets of transparent Mylar were placed over large (1.1m x 1.6m) topographic regional maps, so geographic and other features of interest could be marked directly onto the sheets. The sheets of Mylar were then hand digitized by Knight Piésold staff (i.e., the mapped information was copied into a computer database using a digitizing table) using the AutoCAD software program. Once digitizing was complete, files were transferred over to the Geographic Information System (GIS) software package ArcView for more detailed data analysis and presentation.

A separate series of maps were produced for the workshops and interviews. For example, maps from each of the communities' workshops were digitally combined and then presented according to theme (e.g. Inuit travel routes, ringed seal locations, berry-picking locations). Similarly, maps from each of the individual interviews were digitally combined and also presented according to theme. Presenting data in this fashion allowed for data from all the communities to be displayed at once and facilitated comparison between the two data sources (i.e. workshops and interviews).

These maps have been released in a separate mapbook (KP, 2015). The relevant maps from the mapbook related to freshwater waterbodies are included as Attachment A.

2.3 IQ DATABASE

All interview transcripts, workshop notes and working group meeting minutes were incorporated into a central database and coded to sort by topic. Coding was completed using the NVivo 7 software package, a commonly used application for analyzing qualitative research data. The IQ database contains over 500 topic 'directories', often organized according to major themes. As an example, 'caribou' is one major theme, while 'calving locations', 'migrations' and 'reaction to disturbance' are a few examples of caribou sub-themes. Other major themes include: 'marine mammals', 'birds', 'fish', 'Inuit and the land', 'shipping' and 'terrestrial mammals'. There also exists a directory for all other topics not covered under a major theme. All topic reports were made available on a password-protected FTP site for the various scientists and specialists involved in the Project to use. IQ data from these topic reports is then available to be incorporated into the impact assessment, and for other long-term Project needs.

Keywords were used to code the interview transcripts, workshop notes and working group meeting minutes, as well as the number of references associated with each keyword. The keywords and sub-keywords related to the unique value and/or cultural significance of freshwater waterbodies include:

- Inuit and the Land - camps and living areas, places names, water, water quality, song and stories, and importance of lakes and rivers
- Fish - Arctic char, land-locked (nutilliarjuit), locations and harvesting locations, non-migrating fish, and fish living only in rivers, and stories

The IQ database was compiled and issued to the participating communities and the QIA in 2014. The information can be used by the public, in accordance with the research agreements Baffinland negotiated with the working groups that led the study in each community.

APPENDIX B

Select Interview Questions

(Pages B-1 to B-2)

APPENDIX B
SELECT INTERVIEW QUESTIONS

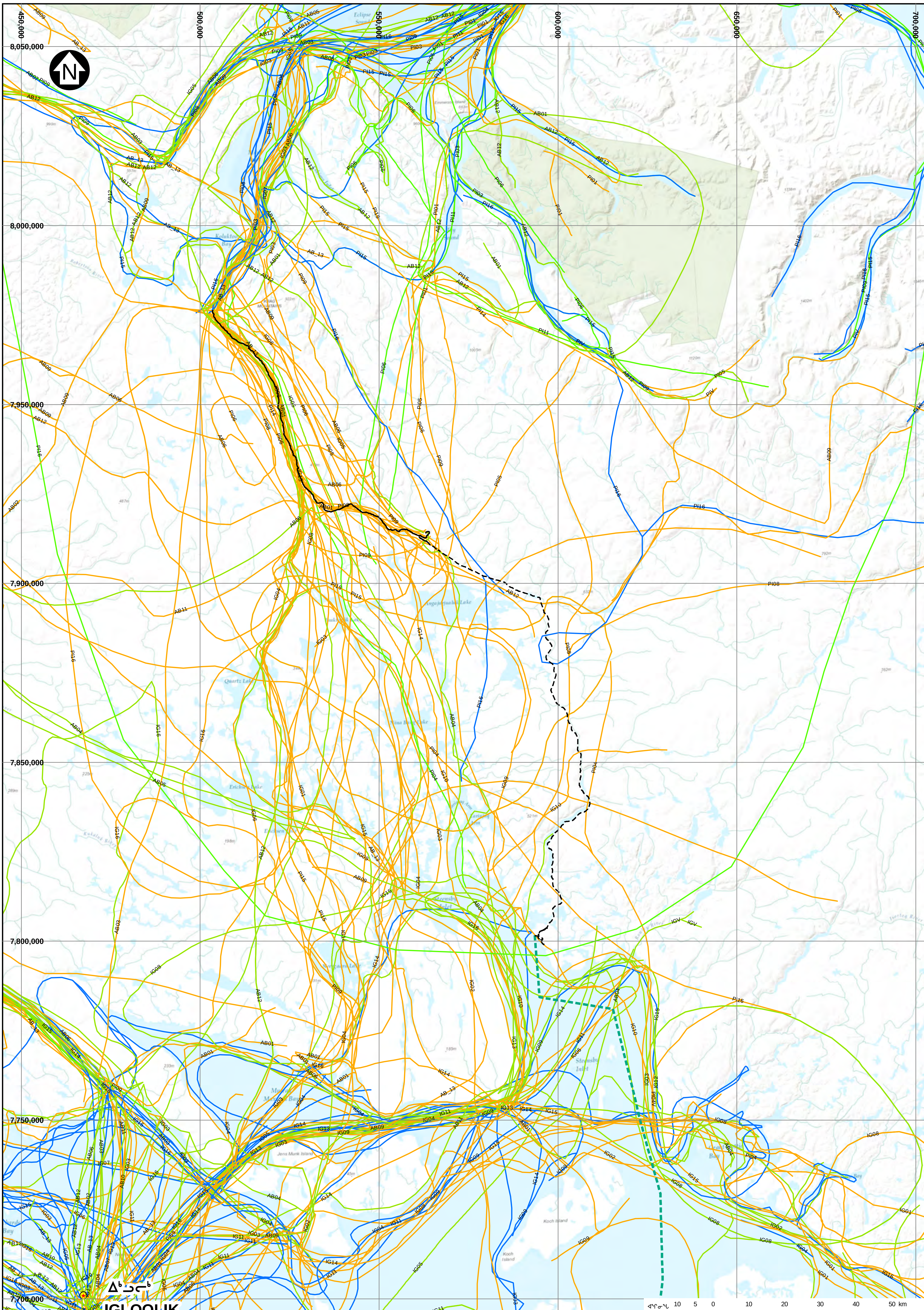
1. Can you show me [on the map] the major camps you used for the areas you will talk about today? Seasons: spring, summer, fall, and winter. Why are these places important?
2. Can you show me [on the map] special areas on the land? These might include sacred places, mythical events, giant sites and supernatural areas that might cause disorientation or where people would receive visits. Other important places would include archaeological sites and burials places.
3. We are interested in place names. Can you give us the names for the major land and water features [on the map] for the areas you know?
4. Where did you go to collect other significant resources such as water, wood, carving stone, stone for fire starters, etc. Did this differ by season - spring, summer, fall, and winter? [Use map]
5. Can you show me [on the map] the areas you traveled with your family when you were young?
6. Can you show me [on the map] the areas you traveled during your adult life up to now? It would be use full to us if you could talk about the seasons you used the land (spring, summer, fall, and winter).
7. Can you show me [on the (map) the major] Inuit travel routes in Mary River area around it? Did these vary by seasons - spring, summer, fall and winter?
8. Could you show me [on the map] which lakes and rivers are most important in your area? Why are they important?
9. What does good water mean to you?
10. Do the places you set nets change by season? [Use map]
11. Where are the best places to jig for fish? [Use map]
12. Are there Arctic char in the _____ River (Individuals may want to discuss several rivers in their traditional lands). Are the fish land locked, or sea run? Do the sea run fish move every year? How far up river do the fish run? Do the fish hold over the winter in the river? [Use map]
13. How did people in the past catch fish in rivers? Do people fish in rivers today?
14. Are the mouths of rivers important fishing areas? Please show me on the map which rivers are important for fishing.
15. Are there areas that were important for fishing in the past but are no longer used?
16. Which lakes do people regularly fish in your area? [Use map] What time of year do people fish on the lakes?
17. Which lakes have Arctic char in your area? [Use map]. Are they sea run or land locked fish? If they migrate when do they return to the lake? When do they return to the sea?

18. Please tell me about fish in lakes and rivers.
19. In which lakes are landlocked char found?
20. In which lakes is migrating char found? When do these fish migrate to the sea? When do they return to lakes?

APPENDIX C

Select MRIKS Figures

Figure No.	Revision	Description
Figure 1.4	0	Travel Routes - Project Study Area (Interview Results)
Figure 1.8	0	Camping Locations - Project Study Area (Workshop Results)
Figure 3.20	0	Water and Ice Features - Project Study Area (Interview Results)
Figure 1.6	0	Berry Picking Locations - Project Study Area (Workshop Results)
Figure 5.2	0	Fish Locations - Project Study Area (Interview Results)
Figure 1.12	0	Special Places - Project Study Area (Interview Results)
Figure 1.16	0	Stone Quarry Locations - Project Study Area (Workshop Results)



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2. ᓄᓇᖑᐊᑦ ᑎᑎᕐᓯᒪᓂᖓ ᒪᓕᒃᖢᒍ UTM (NAD83) ZONE 17 AND IS IN METRES.
   COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. ᐅᓇ ᓄᓇᖑᐊᖅ ᓴᖅᑕᐅᓯᒪᔪᖅ ᑐᑭᓯᔪᑎᒃᓴᐃᑦ ᐅᖃᐅᓯᐅᔪᑦ ᐃᓄᖕᓄᑦ ᐊᕙᑖᓂ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ ᓄᓇᓕᒥᐅᑦ ᐊᐱᖅᓱᖅᑕᐅᓂᖏᓐᓂ ᓄᓇᖏᑦ ᒥᒃᓵᓄᑦ. ᑖᒃᑯᐊ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐃᓄᖕᓄᑦ ᓴᖅᑭᑕᒪᑕ ᓄᓇᐅᑉ ᐊᑐᖅᑕᐅᓂᖓᓂᑦ ᐊᒻᒪ ᓄᓇᖏᑦ ᖃᐅᔨᒪᓂᖅᓯᐅᖏᓐᓄᑦ ᐃᓄᖏᑦ. ᐅᓇ ᓄᓇᖑᐊᖅ ᐃᓗᐃᑦᑐᖑᖏᑦᑐᖅ ᑭᒡᒐᖅᑐᐃᓇᓂᓗ ᐃᓗᐃᑦᑐᒥᒃ ᑕᒪᐃᑕ ᐊᑐᖅᑕᐅᔪᖏᓐᓂᒃ ᓄᓇᐅᑉ ᐊᓂᒃ.
   THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

ᓇᔾᔾᔭᓂ ᐅᔭᖅᑯᓯᐅᕐᑐᑦ MARY RIVER PROJECT

ᓇᓗᓇᐃᕐᑕᐅᓂᖏᑦ ᐃᖏᕐᕋᔾᔪᓂ ᐊᖁᑕᐅᕙᒃᑐᑦ (ᑕᕆᐅᑯᑦ ᐊᒻᒪ ᓄᓇᒃᑯᑦ) ᖃᐅᔨᓴᐅᑎᖓ ᐊᐱᕐᓱᖅᑕᐅᔪᑎ

TRAVEL ROUTES - PROJECT STUDY AREA (INTERVIEW RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

ᑎᑎᕋᐅᓯᐊᖅ FIGURE 1.4

SAVED: I:\102\00181\35\A\GIS\Figs\Figures_IQ\B04_r0.mxd; Oct 23, 2014 10:40 AM; asimpson

Family camping

Family camping

Old and current camping routes

Clyde River, Pond Inlet, Arctic Bay and Igloolik people would all meet here and camp in this area while on inland caribou hunt - Aug-Sept

Old camping sites throughout

Clyde River, Igloolik, Pond Inlet and Arctic Bay people meet here and camp in this area.

NOTE: Almost anywhere there is a camp site, there is a cache site. Caches can be found anywhere on the land and on the coast. After a hunt, hunters would travel to the closest location they could to cache food.

People travel all this area for caribou hunting - camps throughout & places where people would sleep & pile rocks around them to protect them

People traditionally camped all along this area

DIO outpost camp

Re-supply route (Camp to community)

Hunting and camping travel route

Hunting and camping travel route - Dec-May

Hunting & re-supply the camps

Hunting and camping travel route

IGLOOLIK

SCALE 10 5 0 10 20 30 40 50 km

LEGEND:

PLACES THAT YOU HAVE CAMPED IN YOUR LIFETIME

PLACES THAT YOU KNOW YOUR FAMILY AND FRIENDS HAVE CAMPED IN THE PAST

CAMPS THAT WERE OCCUPIED SO LONG AGO THAT YOU DON'T KNOW WHO CAMPED THERE

MILNE INLET TOTE ROAD

PROPOSED RAILWAY ALIGNMENT

NOTES:

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2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT WORKSHOPS IN THE COMMUNITIES OF ARCTIC BAY (JULY 22-23, 2008), CLYDE RIVER (JULY 18-19, 2008), HALL BEACH (JULY 8-9, 2008), IGLOOLIK (JULY 10-12, 2008) AND POND INLET (JULY 15-17 AND SEPTEMBER 4, 2008). THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

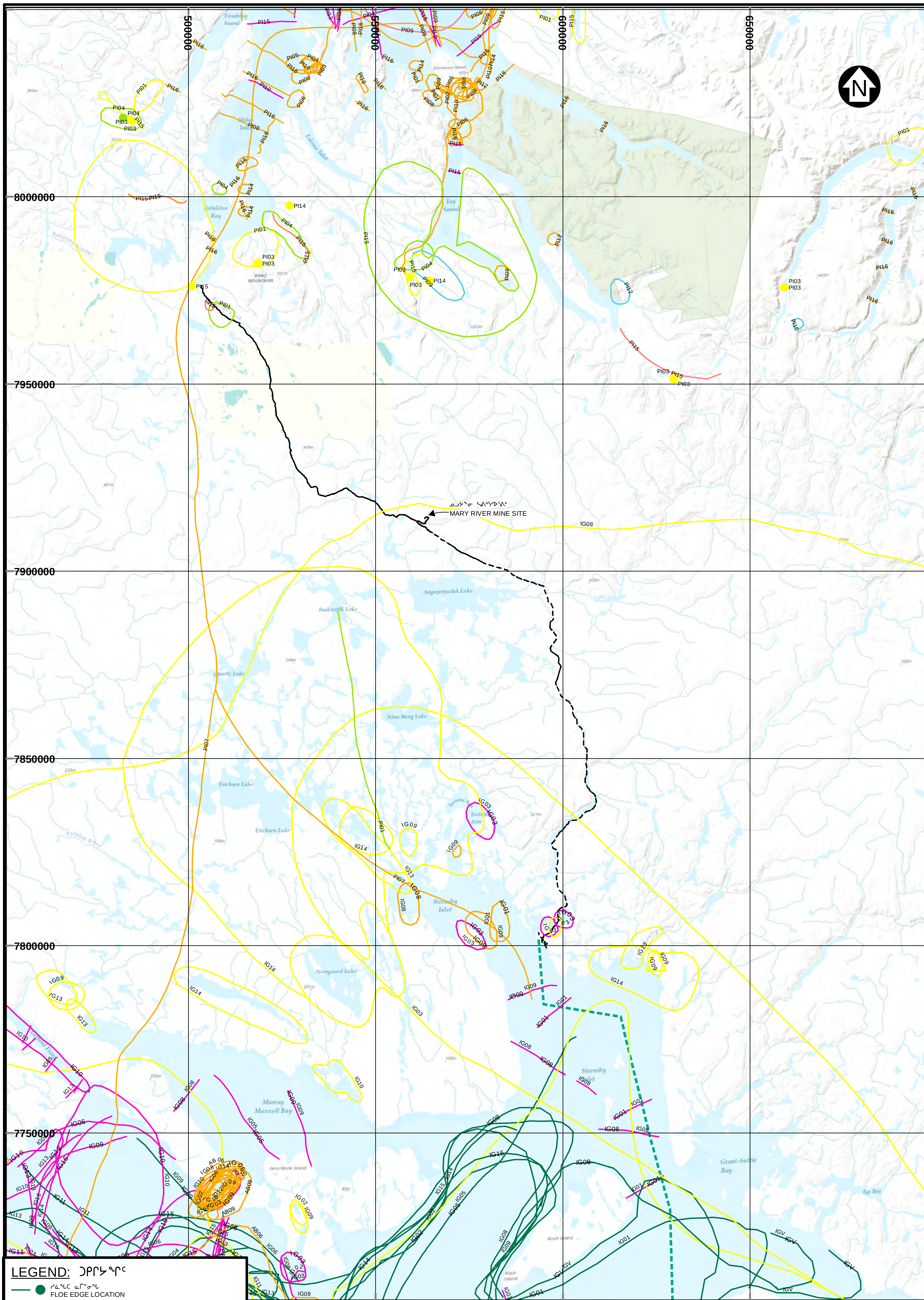
CAMPING LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/25	NB14-00411	0

FIGURE 1.8

SAVED: I:\1\02\00181\35\A\GIS\Figs\Figures_IQ\B08_r0.mxd; Sep 04, 2014 3:23 PM; asimpson



ᐃᓄᑦᑎᑐᑦ SCALE 10 5 0 10 20 30 40 50 Km ᑭᓛᒥᑕ

LEGEND: ᑐᑭᒧᐊᖏᑦ

- ᓯᓈᖓᑕ ᓇᒦᓐᓂᖓ FLOE EDGE LOCATION
- ᑐᕝᕋᑦ ᐊᐃᕙᐅᑉᐸᑦ ᐃᓂᒋᔭᖏᑦ SEA-ICE LEADS LOCATION
- ᓯᑯᖑᓐᓂᖏᑦᑐᖅ ᐊᕐᕌᒍᓕᒫᖅ SEA-ICE OPEN YEAR ROUND
- ᑕᓯᑦ ᐊᒻᒪ ᑰᒃᑐᑦ ᐱᓪᓚᕆᐅᓂᖏᑦ LAKES AND RIVERS OF IMPORTANCE
- ᖃᒥᑦᑕᑦᑐᖅ ᐅᕙᓗᓐᓂᑦ ᐅᓕᑦᑕᑦᓂᖓ ᑕᕐᕙᓂᖓᓗ ᖃᑦᑕᑦᑐᖅ BAD FLOOD OR EXTREMELY HIGH TIDE LOCATION
- ᖃᖓᒃᑲᓐᖓᑦ ᐊᑲᒍ ᐃᒧᐊᓂ ᐃᒥᖅ ᐊᓯᔾᔨᕐᓂᖃᑦᑕᑦᑕᖓ SEASONAL WATER QUALITY CHANGE LOCATION
- ᐃᒥᐅᑦ ᐱᐅᓂᖓᑕ ᐊᓯᔾᔨᕐᓂᖓ ᐃᓂᖓ GENERAL WATER QUALITY CHANGE LOCATION
- ᕿᒍᐊᓂ ᐊᖅᑯᑎ ᐅᓯᒃᑕᕐᕕᒃ MILNE INLET TOTE ROAD
- ᓄᓇᓯᐅᑎᑯᑦ ᐊᖁᑎᒋᓂᐊᖅᑕᖓ PROPOSED RAILWAY ALIGNMENT
- ᐃᑲᖅᑐᕐᓂᑦ ᐅᒥᐊᖅᔪᐊᖅᑐᓂᑦ ᐊᖁᑕᐅᕙᑦᑕᓂᐊᖅᑐᖅ NOMINAL SHIPPING ROUTE

ᖃᐅᔨᒪᔭᒃᓴᐃᑦ NOTES:

1. ᓄᓇᖑᐊᓕᐅᕐᓂᖅ: ᑯᐃᖅ ᑲᓇᑕᒧᑦ
   IMAGERY: © ESRI DATA & MAPS [ONLINE] (2014). REDLANDS, CA: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE. ALL RIGHTS RESERVED.
2. ᓄᓇᖑᐊᖅ ᑎᑎᕐᓯᒪᓂᖓ ᒪᓕᒃᑐᖅ UTM (NAD83) ZONE 17 AND IS IN METRES.
   COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. ᐅᓇ ᓄᓇᖑᐊᖅ ᓴᖅᑭᑕᐅᓯᒪᔪᖅ ᑐᑭᓯᐊᕐᑎᒃᓴᐃᑦ ᐅᖃᐅᓯᐅᔪᑦ ᐃᓄᖕᓄᑦ ᐊᑦᔨᒌᖕᖏᑦᑐᓂᒃ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ ᓄᓇᓕᒥᐅᑦ ᐊᐱᖅᓱᖅᑕᐅᓯᒪᑎᓪᓗᒋᑦ ᓄᓇᒥᑦ ᒥᒃᓵᓄᑦ. ᑖᓐᓇ ᓇᓗᓇᐃᖅᓯᓯᒪᔪᑦ ᐃᓄᓐᓄᑦ ᓴᖅᑭᑎᓪᓗᒋᑦ ᓄᓇᐅᑉ ᐊᑐᖅᑕᐅᓂᖓᓂᒃ ᐊᒻᒪ ᓄᓇᒥᑦ ᖃᐅᔨᒪᓂᕐᓂᒃ ᐃᓄᒋᐊᖏᑦ. ᐅᓇ ᓄᓇᖑᐊᖅ ᐃᓗᐃᑦᑑᖏᑦᑐᖅ ᑭᒡᒐᖅᑐᐃᓇᓂᒃ ᐃᓗᐃᑦᑐᒥᒃ ᑕᒪᐃᑦ ᐊᑐᖅᓯᒪᔭᖏᓐᓂᒃ ᓄᓇᐅᔭᖅ.
   THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION			
ᓄᓘᔾᔨᓂ ᐅᔭᕋᖅᓯᐅᕐᕕᒃ MARY RIVER PROJECT			
ᓇᓗᓇᐃᖅᑕᐅᓂᖏᑦ ᐃᒪᖃᕐᕕᖏᑦ ᐊᒻᒪ ᓯᑯᖃᕐᕕᖏᑦ ᑕᒪᓇ ᖃᐅᔨᓴᐅᓂᖓ ᐊᐱᕐᓱᖅᑕᐅᓯᒪᔪᑦ WATER AND ICE FEATURES - PROJECT STUDY AREA (INTERVIEW RESULTS)			
Knight Piésold CONSULTING	P/A NO. NB102-181/35	REF. NB14-00411	REV. 0
	ᑎᑎᕋᐅᓯᐊᖅ FIGURE	3.20	

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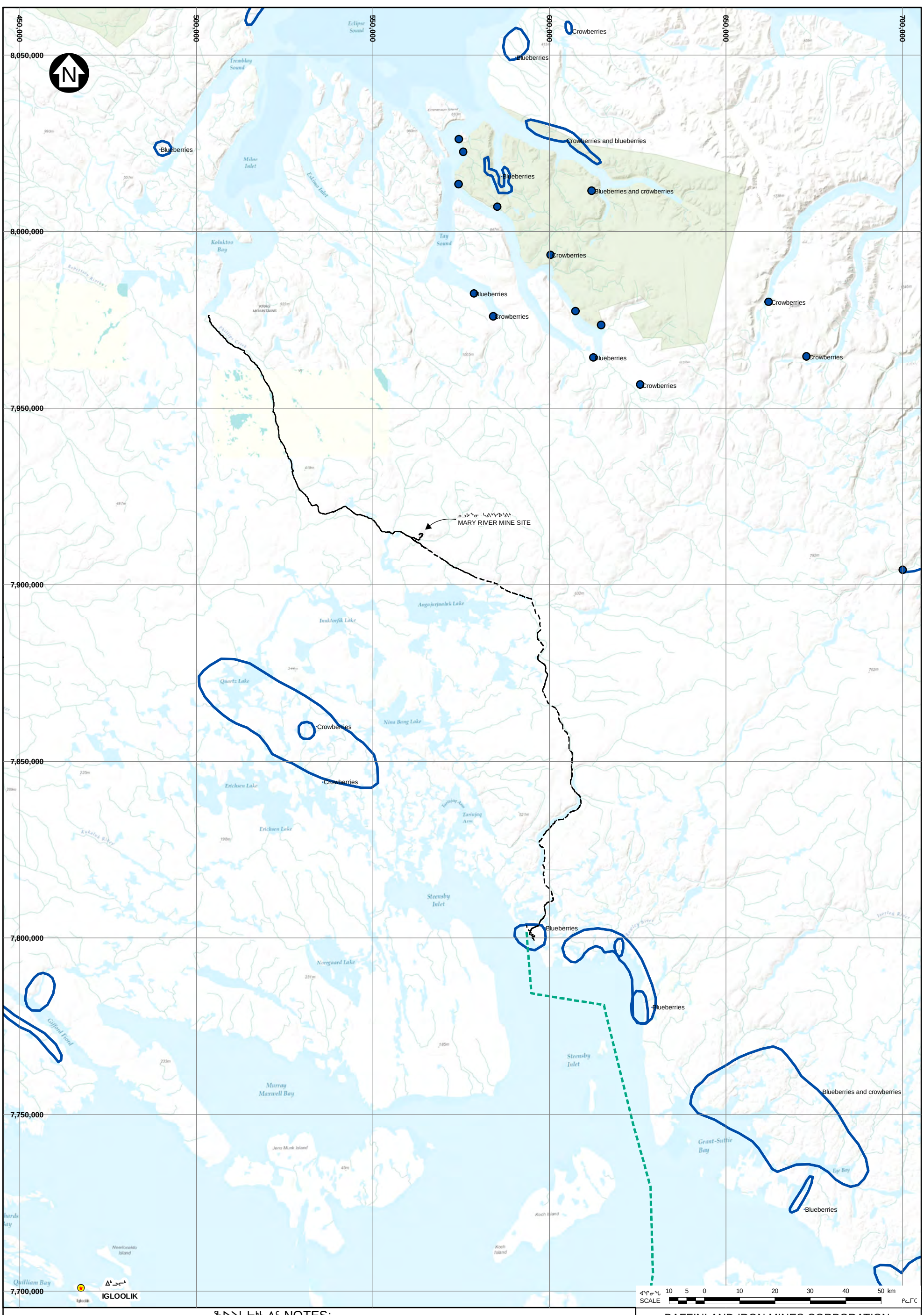

LEGEND:

- BERRY PICKING PLACES
- MILNE INLET TOTE ROAD
- PROPOSED RAILWAY ALIGNMENT
- NOMINAL SHIPPING ROUTE

NOTES:

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SCALE 10 5 0 10 20 30 40 50 km

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BERRY PICKING LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

FIGURE 1.6

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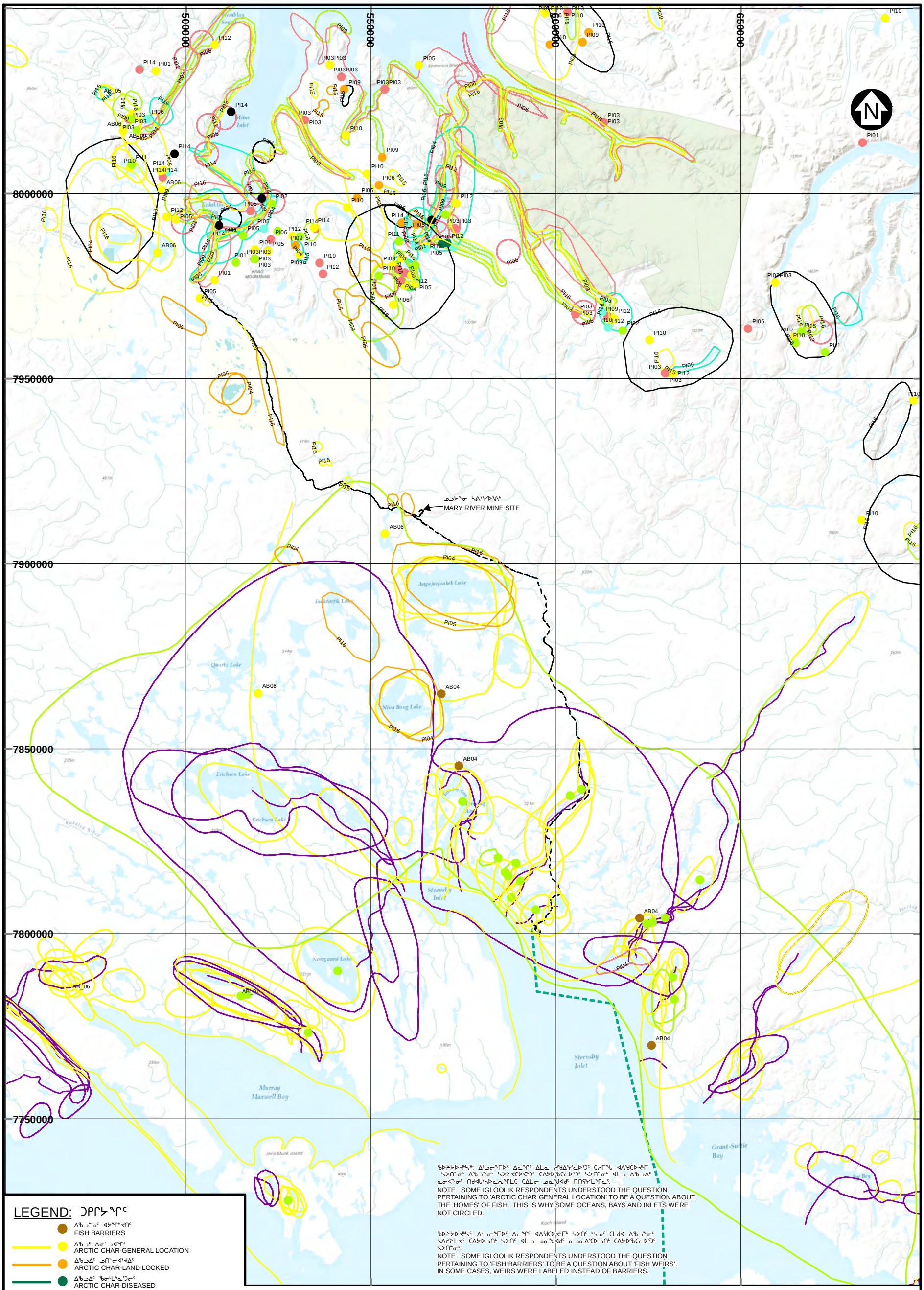
550000
600000
650000
8000000
7950000
7900000
7850000
7800000
7750000
MARY RIVER MINE SITE
Milne Inlet
Angajurjualuk Lake
Inuktorfik Lake
Quartz Lake
Nina Bang Lake
Erichsen Lake
Steensby Inlet
Neergaard Lake
Murray Maxwell Bay
Jens Munk Island
Grant-Suttie Bay
Koch Island
Kakaluq River
KRAG MOUNTAINS
N
NOTE: SOME IGLOOLIK RESPONDENTS UNDERSTOOD THE QUESTION PERTAINING TO 'ARCTIC CHAR GENERAL LOCATION' TO BE A QUESTION ABOUT THE 'HOMES' OF FISH. THIS IS WHY SOME OCEANS, BAYS AND INLETS WERE NOT CIRCLED.
NOTE: SOME IGLOOLIK RESPONDENTS UNDERSTOOD THE QUESTION PERTAINING TO 'FISH BARRIERS' TO BE A QUESTION ABOUT 'FISH WEIRS'. IN SOME CASES, WEIRS WERE LABELED INSTEAD OF BARRIERS.
LEGEND:
FISH BARRIERS
ARCTIC CHAR-GENERAL LOCATION
ARCTIC CHAR-LAND LOCKED
ARCTIC CHAR-DISEASED
ARCTIC CHAR-POPULATION FLUCTUATING
RIVER OF IMPORTANCE
FISHING LOCATION YEAR-ROUND
JIG AND NET FISHING LOCATION
OCEAN FISHING LOCATION
MILNE INLET TOTE ROAD
PROPOSED RAILWAY ALIGNMENT
NOMINAL SHIPPING ROUTE
NOTES:
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2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.
SCALE 10 5 0 10 20 30 40 50 Km
BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
FISH LOCATIONS - PROJECT STUDY AREA
(INTERVIEW RESULTS)
Knight Piésold CONSULTING
P/A NO. NB102-181/35
REF. NB14-00411
REV. 0
FIGURE 5.2
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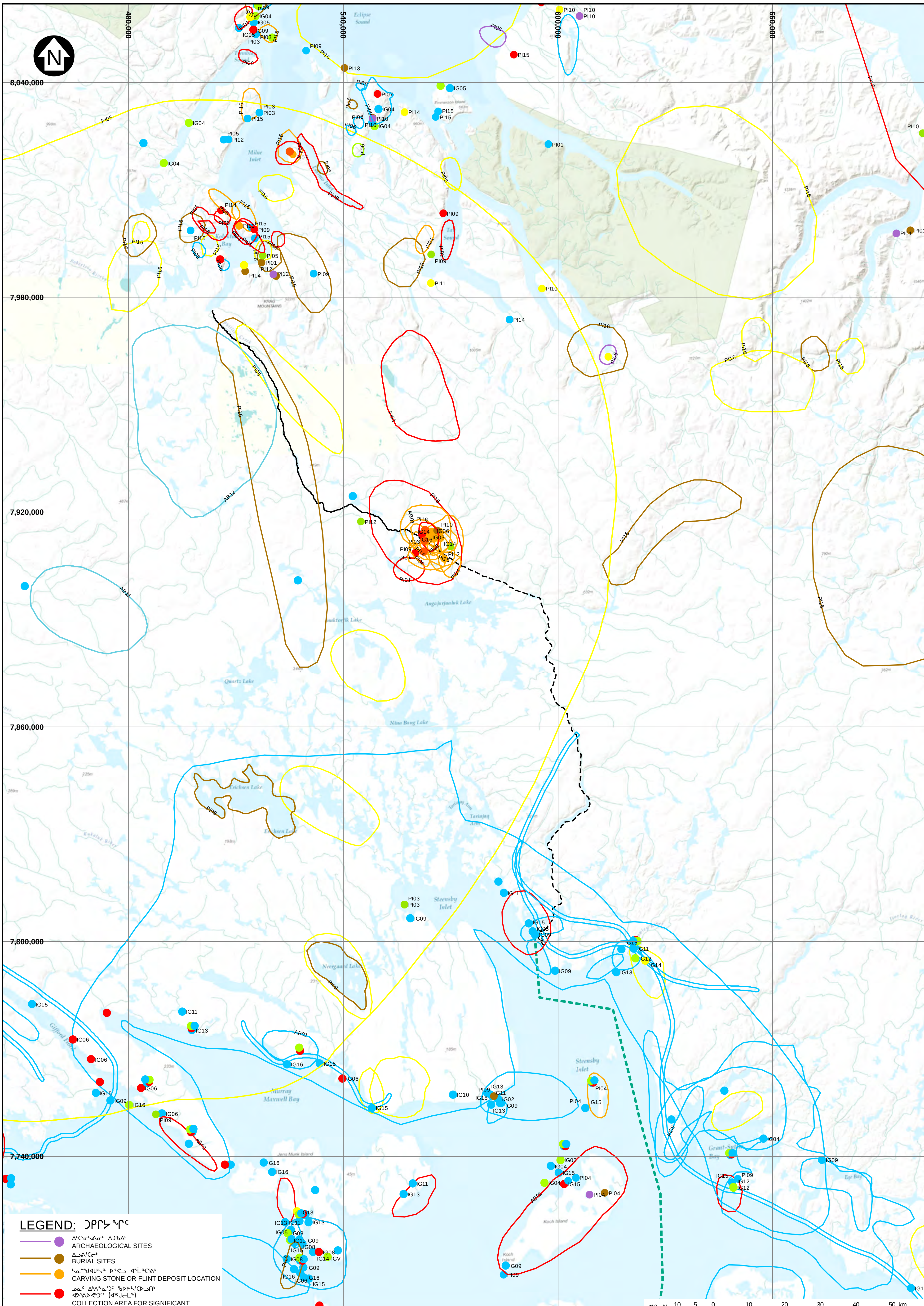

LEGEND: ᑐᑭᒋᔭᖏᑦ

ᐃᑦᑕᕐᓂᓵᕆᓂᑦ ᐱᑐᖃᐃᑦ
ARCHAEOLOGICAL SITES

ᐃᓗᕕᕐᑕᓕᒃ
BURIAL SITES

ᓴᓇᓐᖑᐊᒐᒃᓴᖅ ᐅᑭᐅᓗ ᐊᖑᒻᒪᑦᑎᕕᒃ
CARVING STONE OR FLINT DEPOSIT LOCATION

ᓄᓇᑦ ᐃᑉᐱᖕᓇᕐᑐᑦ ᖃᐅᔨᓴᕐᑕᐅᓗᑎᒃ
ᐊᕐᕌᒍᑕᒫᖅ (ᐊᕐᕋᒍᓚᒻᒪᖅ)
COLLECTION AREA FOR SIGNIFICANT RESOURCES (YEAR-ROUND)

ᐊᐱᖅᓱᖅᑕᐅᔪᑦ ᐃᓅᕐᕕᖓ
CONSULTANT'S BIRTH LOCATION

ᐊᐱᖅᓱᖅᑕᐅᔪᑦ ᑕᒫᕐᕕᓂᖓ ᐊᒻᒪ ᐊᑐᖅᑕᐅᒐᔪᑦᑐᐱ
ᓄᑦ ᑕᒫᕐᕕᑦ ᐊᕐᕌᒍᓕᒫᑦ ᐊᑐᖅᑕᐅᔪᓂᒃ
CONSULTANT'S CAMP LOCATION AND MAJOR YEAR-ROUND CAMPS

ᐊᓐᓂᖅᓴᐅᓪᓚᕆᒃᑐᑦ ᓄᓇᐃᑦ ᑕᕆᐅᓪᓗ
SPECIAL AREAS

ᑮᖑᐊᓂ ᐊᕐᖁᑎ ᐅᓯᒃᑕᕐᕕᒃ
MILNE INLET TOTE ROAD

ᓄᓇᓯᐅᑎᑯᑦ ᐊᖁᑎᒋᓂᐊᕐᑕᖓ
PROPOSED RAILWAY ALIGNMENT

ᐃᓚᓐᓂᑯᑦ ᐅᒥᐊᔪᐊᓐᓂᑦ ᐊᖁᑕᐅᖃᑦᑕᓂᐊᕐᑐᖅ
NOMINAL SHIPPING ROUTE

ᖃᐅᔨᒪᔭᒃᓴᐃᑦ NOTES:

1. ᓄᓇᙳᐊᓪᓗᐊᑕᐃᑦ: ᑯᐃᓐ ᑲᓇᑕᒧᑦ
BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004). ALL RIGHTS RESERVED.
2. ᓄᓇᙳᐊᑦ ᑎᑎᕐᒪᓂᖓ ᒪᓕᒃᑐᖅ UTM (NAD83) ZONE 17 AND IS IN METRES.
COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. ᐅᓇ ᓄᓇᙳᐊᖅ ᓴᖅᑭᑕᐅᓯᒪᔪᖅ ᑐᑭᓯᔪᑎᒃᓴᐃᑦ ᐅᖃᐅᓯᐅᔪᑦ ᐃᓄᓐᓄᑦ ᐊᕙᑎᓐᓂ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᐅᔪᖏᑦ ᓄᓇᓕᒥᐅᑦ
ᐊᐱᖅᓱᖅᑕᐅᑎᓪᓗᒋᑦ ᓄᓇᖏᑦᑕ ᒥᒃᓵᓄᑦ. ᑖᒃᑯᐊ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐃᓄᓐᓄᑦ ᓴᖅᑭᑎᕆᓪᓚᑕ ᓄᓇᐅᑉ ᐊᑐᖅᑕᐅᓂᖓᓂᑦ ᐊᒻᒪ
ᓄᓇᖏᑦᑕ ᖃᐅᔨᒪᓂᖃᕐᓂᖏᓐᓂᑦ ᐃᓄᖏᑦᑕ. ᐅᓇ ᓄᓇᙳᐊᖅ ᐃᓗᐃᑦᑐᖓᖏᑦᑐᖅ ᐱᒋᐅᖅᑐᐃᓇᓂᓗ ᐃᓗᐃᑦᑐᒥᒃ ᑕᒪᐃᑦ ᐊᑐᖅᓯᒪᔭᖏᓐᓂᒃ
ᓄᓇᐅᔪᓂᒃ.
THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

ᓄᓘᔮᓂ ᐅᔭᕋᖕᓯᐅᕐᑐᑦ MARY RIVER PROJECT

ᓄᓇᐃᑦ ᐱᓐᓇᓱᐊᕐᓂᐊᕐᑕᐅᔪᑦ - ᐱᓕᕆᐊᕐᕕᐅᔪᖅ ᐃᓗᐊᓂ (ᐊᐱᖅᓱᕐᓂᖏᑦ ᖃᐅᔨᓴᐅᑎᑦ)

SPECIAL PLACES - PROJECT STUDY AREA (INTERVIEW RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

ᑎᑎᖅᐅᔭᖅᓯᒪᔪᖅ FIGURE 1.12

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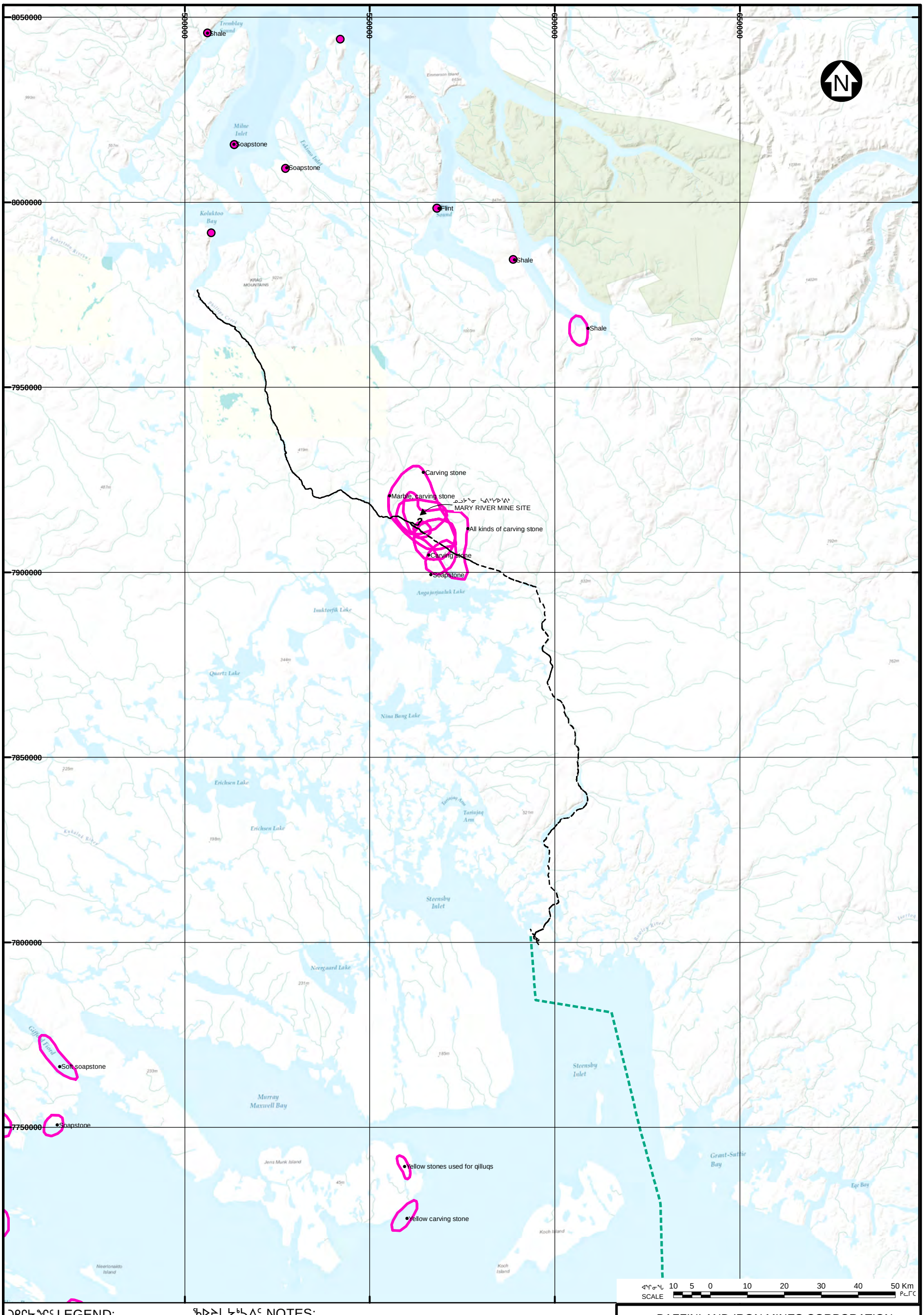

LEGEND:

- STONES USED BY PEOPLE
- MILNE INLET TOTE ROAD
- PROPOSED RAILWAY ALIGNMENT
- NOMINAL SHIPPING ROUTE

NOTES:

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2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT WORKSHOPS IN THE COMMUNITIES OF ARCTIC BAY (JULY 22-23, 2008), CLYDE RIVER (JULY 18-19, 2008), HALL BEACH (JULY 8-9, 2008), IGLOOLIK (JULY 10-12, 2008) AND POND INLET (JULY 15-17 AND SEPTEMBER 4, 2008). THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

STONE QUARRY LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF.	REV
NB102-181/35	NB14-00411	0

FIGURE 1.16

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APPENDIX 3: TUSAQTAVUT PATHWAY BREAKDOWN – EFFECTS ASSESSMENT SUMMARY TABLE (FISH AND FRESHWATER)

Tusaqtavut Pathway Breakdown - Effects Assessment Summary Table (Fish and Freshwater)

Primary Pathway	FEIS/FEIS Addendum (ERP) Prediction Source – FEIS/FEIS Addendum (ERP)	FEIS/FEIS Addendum (ERP) Mitigation Source – FEIS/FEIS Addendum (ERP)	Tusaqtavut Report Concern – Pond Inlet Source – Tusaqtavut Report (Pond Inlet)	Tusaqtavut Report Concern – Hall Beach & Igloolik Source - Tusaqtavut Report (Hall Beach & Igloolik)	High level Summary of Monitoring Results Source – Relevant Monitoring Reports (various)	Relevant Phase 2 Effect Pathway Source – Updated Phase 2 PD Overview (submitted Jan 6th)	FEIS Addendum (Phase 2) Prediction Source – FEIS Addendum (Phase 2)
Impact to quality and quantity of water from the Tote Road and mine site	The project will not have significant adverse residual effect on water quantity (FEIS, Volume 7, Section 2.4, p. 88). Ground preparation and earthworks may result in changes to surface water and sediment quality in the five freshwater aquatic LSAs (FEIS, Volume 7, Section 3.4.2.1, p. 120). However, residual effects are predicted to not be significant (FEIS, Volume 7, Table 7.3-12, p. 120). the effects of dust deposition are predicted to be restricted to a thin surficial layer in depositional areas (primarily deeper areas of lakes), and the CCME SQGs are recommended to be applied to the upper 5 cm of sediments, effects of this pathway on Arctic Char have been ranked as of low magnitude for arsenic and cadmium, of moderate magnitude for iron, and negligible for nickel. Effects on sediment quality will be long-term (Level III), continuous (Level III), and limited to portions of the LSA (Level I) (FEIS, Volume 7, Section 4.5.5.1, p. 219).	Detailed stormwater management plans, water balances and sediment and erosion control plans prepared during the detailed design phase as part of a future update to the Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan will be important for the management of water resources (FEIS, Volume 7, Section 3.4.4.1, p. 174).	participants also expressed concerns about water contamination in the Study Area. One interview participant explained that since they have been advised to not drink fresh water within the vicinity of the Mary River mine site, they will only collect water from a filtered tap located at the mine when travelling on the land. One reason stated for not drinking fresh water near the mine site is the rising observance of sediment in the water (Section 4.4.3, p. 95). The decline in water quality near the existing mine site has raised concerns about the quality of water within Pond Inlet. One interview participant described how even through a home filtration system, the clarity of the water has declined and rendered its potability questionable (Section 4.4.3, p. 96).		<u>Quantity:</u> Although the total daily water withdrawal limit for Camp Lake was not exceeded in 2018, there were four (4) incidents where the daily water volume withdrawn for domestic purposes exceeded Camp Lake's domestic daily water withdrawal limit. These incidents are believed to be a result of the mis-categorization of water volumes withdrawn for industrial purposes. To prevent similar incidents from re-occurring, Baffinland plans to improve the documentation and categorization of water volumes withdrawn to support Project activities. No other water withdrawal incidents or exceedances for domestic and industrial water uses were noted in 2018 (2018 NWB annual report, Section 4.1, p. 16). 4 exceedances in daily water withdrawal limits; however, weekly and monthly limits were not exceeded (2018 NWB annual report, Section 4.2, p. 16). <u>Quality:</u> one exceedance of effluent discharge criteria for treated sewage effluent (2018 NWB Annual Report, Section 7.1, p. 26).	Trucking – daily round trips for ore hauling and servicing will be in excess of 350 transits (Table 2.6, p.6). Once North Railway is operational, ore haulage by road will be discontinued, Section 2.2.1.2, p.6).	Effects to water quantity resulting from the South Railway and Steensby Port remain unchanged from what was assessed in the FEIS (TSD 13, Section 2.5, p. 9). The Phase 2 Proposal will not involve any meaningful changes to how water is managed at the Mine Site, as there are no changes to the mine plan or how waste rock will be managed. The volume of mine effluent stormwater to be discharged from the ore crusher pad at the Mine Site will increase because the size of the crusher pad and stockpiles will increase (TSD 13, Section 2.5, p. 10). Residual water quantity effects are predicted to be not significant (TSD 13, Section 2.5.4, p. 21). Incremental increase in annual stormwater runoff associated with the Phase 2 Proposal will not result in adverse impacts to downstream water quality in the Mary River (TSD 13, Section 3.5.1.1, p. 32).

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					One lead exceedance during discharge of treated effluent from Mine site, otherwise metal concentrations were within acceptable range for discharge (NWB Annual report, Section 7.2, p. 28). One exceedance of applicable water quality criteria involving surface water runoff downstream of landfill facility. One exceedance of applicable water quality discharge criteria from the WRF Pond (NWB Annual Report, Section 7.3.3, p. 30). Overflows and release of non-compliant runoff discovered along WRF west perimeter ditch (2018 NWB Annual Report, Section 7.3.3, p. 31).		Relative to the Approved Project, the annual TSP deposition within the contributing catchments of Camp Lake and Sheardown Lake will be reduced by an estimated 31% and 25%, respectively, with the implementation of the Phase 2 Proposal. The reduction in dust deposition within the immediate Mine Site area will result in a corresponding reduction in the quantity of ore dust that is potentially available to runoff into local watercourses. (TSD 13, Section 3.5.2.1, p. 35). Based on this assessment, the effect of the Phase 2 Proposal on surface water quality is assessed to be not significant (TSD 13, Table 3.6, p 52).
Impact to the health and condition of fish (arctic char) due to changing water quality and impacts from the Milne Port and Northern Shipping Route	The freshwater distribution of Arctic Char in the Milne Port LSA is limited, hence potential effects on health and condition as a consequence of water quality changes, are limited. There will be no point sources discharged to freshwater habitat in the Milne Port LSA (FEIS, Volume 7, Section 4.5.3, p. 212). Overall, effects of water quality changes due to discharge of the West Waste Rock Stockpile runoff on Arctic Char health and condition are considered to be of Low to Medium magnitude (FEIS, Volume 7, Section 4.5.5.4, p. 220).	Minimize the footprint of disturbance; • Schedule ground preparation to maintain adequate ground cover during periods of expected rainfall; • Install and maintain water management features, designed to segregate and prevent co-mingling of offsite water and onsite water; • Install and maintain adequately designed erosion control features; • Install and maintain adequately designed sediment transport control features;		During interviews, community members also expressed concerns about the impact of dust on fish health. The potential for windborne dust to impact fish in a number of watersheds surrounding the Project was identified by a number of participants during the verification meetings (Section 4.4.3, p. 69).	Although arctic char captured at the nearshore of Camp Lake exhibited significantly lower condition compared to those captured at Reference Lake 3 in 2018, as well as to those captured at Camp Lake during the mine baseline studies, the magnitude of these differences were generally within the range of variability expected to occur naturally (2018 CREMP, Section 3.3.7, p. 79).	Route 3 has been subject to additional fisheries field work, and it has been confirmed the alignment falls within the spatial scope of previous assessments related to air quality, wildlife and archaeology (Section 2.2.2.1, p. 9).	Effects of dust on TSS are therefore expected to have a Level I magnitude of effect on Arctic Char health and condition (TSD 14, Section 2.5.4, p. 32). The effects of the Phase 2 Proposal on Arctic Char are predicted to be not significant (TSD 14, Table 2-9, p. 35).

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		• Capture and treat potentially contaminated site run-off to applicable water quality standards prior to discharging to the receiving environment; and • Erosion control measures (FEIS, Volume 7, Section 3.4.2.1, p. 121).			No significant changes in length-to-weight relationships were observed when comparing 2017 and 2018 data for char and sculpin (2018 MEEMP, Section 5.1.5, p. 98). 2 previously identified fish-bearing sites were dry during the spring 2019 survey due to low fresehet (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 4). All other surveyed streams were fish-bearing (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 6).	The North Railway will cross several watercourses along the Northern Transportation Corridor. Bridges will be installed at four railway water crossings. Culverts will be installed at other water crossings along the railway (Section 2.2.2.2, p. 10).	Predicted residual effects of the Phase 2 Proposal on Arctic Char are of low magnitude (Level I), medium term to permanent (Level II – Level III), infrequent to continuous in frequency (Level I – Level III), and confined to the LSA (Level I) (TSD 14, Section 2.5.6, p. 34).
Habitat loss and alternation in both the marine and freshwater environments for arctic char due to mining-related activities, leading to the decline in fish populations	Effects related to Project footprints in the Milne Port LSA on Arctic Char habitat are expected to be negligible (FEIS, Volume 7, Section 4.5.3.3, p. 213). Potential effects of the Project on direct mortality of Arctic Char are limited to potential for stranding of eggs due to water withdrawals (FEIS, Volume 7, Section 3.5.3.6, p. 215). As such, effect of water withdrawals on char habitat is considered to be negligible (FEIS, Volume 7, Section 4.5.3.7, p. 215). Construction, Operation and Closure activities in the Railway/Access Road LSA are expected to result in Negligible to Low magnitude of effects on Arctic Char habitat (FEIS, Volume 7, Section 4.5.6.10, p. 242).	Same as above, and: Mitigation measures to avoid or minimize Project footprints and habitat alteration in waterbodies (FEIS, Volume 7, Table 7-4.13, p. 249).	Participants have observed a decrease in available char near the existing mine site and Tugaat River, as well as a decline in fish counts and quality of fresh water along the Tote Road and Mary River (Section 4.4.3, p. 94). In addition to the disruption of peaceful fishing practices, the quantities of available fish species have been observed to be in decline in the past decade. One participant highlighted how in the past, char used to be in greater abundance. The declines in char remain noticeable today (Section 4.4.3, p. 94). Valued fishing locations, such as the Mary River and Tugaat River, were specifically observed to have fewer fish than in the past (Section 4.4.3, p. 95).	Concerns about impacts on fish populations and fish migration routes in and around Ikpikitturjuaq, which is a high-value area for harvesting arctic char (Section 4.4.3, p. 69).	Analysis of Camp Lake arctic charr populations suggested greater fish abundance compared to Reference Lake 3 in 2018, and no decline in the numbers of arctic charr in 2018 compared to the Camp Lake baseline studies (2018 CREMP, Section 3.3.7, p. 79). Habitat upstream and downstream of the road at these two (2) crossings is similar, suggesting no natural barriers or uneven distribution of preferred habitat types that could be affecting fish movements (Tote Road Fish Habitat Monitoring Report 2019, Section 3.3, p.7). Despite a shorter total deployment period and the recovery of only one set of settlement baskets in 2019, total encrusting organisms and total unique taxa counts	The North Railway will cross the existing Tote Road at 8 locations. The Tote Road will be modified at these crossing locations. There is potential for the aquatic environment to be impacted by modifications (Section 2.2.1.1, p. 6). The North Railway will cross several watercourses along the Northern Transportation Corridor. Bridges will be installed at four railway water crossings. Culverts will be installed at other water crossings along the railway (P2 Proposal Project Description Overview January 6 Submission, Section 2.2.2.2, p. 10).	The multiple water takes from Phillips Creek and from Muriel Lake will have minimal impact on stream flows, and on fish and fish habitat (TSD 13, Appendix C, Section 3.2, p. 8). The phase 2 Proposal will not result in residual impacts to freshwater fish and fish habitat at Milne Port (TSD 15, Section 5.4, p. 21). Effect is expected to result in a negligible decrease in the productive capacity of char habitat (i.e., < 1% of overall available habitat will be affected). Lake/pond encroachments/infilling are expected to result in low magnitude reduction in habitat and productive capacity (i.e., < 4%) (TSD 14, Table 2-9, p. 35).

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					were higher in 2019 than 2018. Deployments of each of the settlement baskets and plates in 2018 extended over a period of 24 months and 12 months, respectively. A total of 1,733 encrusting epifauna from 8 unique taxa were identified in 2018. Epifauna counts in 2019 represent a 34% increase in total organisms and a 125% increase in unique taxa (2019 Milne Ore Dock Fish Offset Monitoring Report, Section 4.2.1, p. 10).	In order to accommodate the shipment of 12 Mtpa and the North Railway operation, the Milne Port PDA must be expanded (i.e. shiploader) Section 2.3, p. 12). A second ore dock capable of berthing capesize ore carriers will be required to deliver 12 Mtpa of ore to market via Milne Port (Section 2.3.2, p. 14).	
Species avoidance of areas due to impacts to fish habitat and diminished water quality	The effect of loss of habitat due to impeded fish passage is expected to be negligible (FEIS, Volume 7, Section 4.5.6.4, p. 240). Effects of water withdrawals on fish passage in outflow streams are also considered negligible (FEIS, Volume 7, Section 4.5.6.5, p. 240).	Same as above.			Habitat upstream and downstream of the road at these two (2) crossings is similar, suggesting no natural barriers or uneven distribution of preferred habitat types that could be affecting fish movements. It was, therefore, determined that the highly perched culvert at CV-111 and the combination of perched culvert and high culvert velocities at CV-225 were limiting or obstructing fish movements (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 6).		Fish-bearing culverts that have been identified as potential fish passage barriers will be assessed on a case-by-case basis (TSD 13, Section 2.5.2, p. 16). With implementation of design and mitigation measures, effects of culvert installations on fish passage are assumed to be negligible (TSD 14, Section 2.5.1.2, p. 23).

APPENDIX 4: PROJECT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER STREAMS AND PONDS (NSC, 2021)