



November 1, 2018

Assol Kubeisinova
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**RE: Baffinland Response to Comments
2017 QIA & NWB Annual Report for Operations
Mary River Project, Type 'A' Water Licence - 2AM-MRY1325 - Amend. No. 1**

Baffinland Iron Mines Corporation (Baffinland) has reviewed the comments and recommendations received from the Qikiqtani Inuit Association (QIA), Nunavut Water Board (NWB), Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) and Environment and Climate Change Canada (ECCC) in regards to Baffinland's 2017 QIA & NWB Annual Report for Operations.

Baffinland thanks all parties for their comments and reviews of the 2017 QIA & NWB Annual Report for Operations. Baffinland's responses to the comments and recommendations are provided in Attachment 1 of this letter.

Please do not hesitate to contact the undersigned should you have any remaining questions or comments.

Regards,

A handwritten signature in black ink, appearing to read "Chris Murray", with a large, stylized loop at the end.

Christopher Murray
Environmental & Regulatory Compliance Manager

Attachments:

Attachment 1: Baffinland Response to Comments

Cc: Karén Kharatyan (NWB)
Fai Ndofo, Sean Joseph (QIA)
Sarah Forté, Bridget Campbell, Ian Parsons (CIRNAC)
Gabriel Bernard-Lacaille (ECCC)
Grant Goddard, Megan Lord-Hoyle, Tim Sewell, Connor Devereaux, William Bowden, Andrew Vermeer (Baffinland)

Attachment 1

Baffinland Response to Comments

Table A-1 - Baffinland Response to Comments - 2017 QIA & NWB Annual Report for Operations

Comment ID and Topic	Comment	Recommendation/Request	Baffinland Response	Due Dates Assigned by NWB ¹
CIRNAC				
1. Surface Runoff and Seepage Monitoring Program Stations	<p>In the review of the 2016 Annual Report, CIRNAC, recommended that Baffinland clarify, “If stations MS-MRY-9 and MS-MRY-10 will remain inactive because they are longer needed, and if so provide justifications of why they are no longer needed.” Baffinland responded with the following:</p> <p>“Baffinland is currently reviewing water quality monitoring of surface water runoff from Deposit 1 to determine if stations should be relocated or classified as permanently inactive, and will provide an update to the NWB in the 2017 Annual Report required under the Type “A” Water Licence.”</p> <p>In the 2017 Annual Report, an update has not be provided and the paragraph describing these monitoring stations is nearly identical to the 2016 Annual Review.</p>	<p>CIRNAC recommends reporting whether these monitoring stations (MS-MRY-9 and MS-MRY-10) will be relocated or classified as permanently inactive. If they are classified as permanently inactive, justification should be provided as to why they are no longer needed.</p>	<p>Both MS-MRY9 and MS-MRY-10 were established during the 2008 Bulk Sampling Program and Exploration Phase of the Project. Expansion of infrastructure in the area of Deposit No. 1 has resulted in the lack of flows at these monitoring stations. Because of this, these stations have become inactive. Baffinland plans to relocate these monitoring locations and will provide a formal request to the NWB to relocate these monitoring locations in the 2018 Annual Report submission.</p>	November 1, 2018
2. Progressive Reclamation of Km 97 Borrow Source Area	<p>Baffinland states in the 2017 Annual Report, “Work will proceed with improved weather and when the appropriate resources are scheduled.” In Baffinland’s response to CIRNAC comments on the 2016 Annual Report, they say “Baffinland plans to continue implementing the remediation plan for the historical km 97 borrow sources in 2018.”</p> <p>This comment is a reminder that implementation of the reclamation work plan is scheduled for 2018 and should be included in the 2018 Annual Report.</p>	<p>Refer to comment.</p>	<p>Noted. Baffinland will be provide an update on the reclamation status of the Km 97 historical borrow sources in the 2018 Annual Report submission.</p>	March 31, 2019
3. Landfarm Capacity	<p>Baffinland states the following in the 2017 Annual Report: “Ongoing operation and the treatment in accordance with Baffinland’s Operation Maintenance and Monitoring Manual (BAF-PH1-320-T07-0005) will be undertaken during the 2018 summer season to address the increasing amount of impacted soils stored at the Landfarm Facility.” Table 2.8 reports that an additional 537 m3 of hydrocarbon impacted soil was deposited on the 9,900 m3 already contained in the landfarm, equalling 10,437 m3 of total soil volume in a landfarm that is designed for 9,000 m3 capacity.</p> <p>In the review of the 2016 Annual Report, CIRNAC noted that the landfarm was already over capacity which would make soil treatment difficult. CIRNAC recommended that Baffinland “...specify where they intend to store a new contaminated soil and how they proposed to treat or discard the soil presently at the landfarm.”</p> <p>The 2017 Annual Report does not detail any removal or discarding of the soil previously in the landfarm, nor does it detail storage of new hydrocarbon impacted soil outside of the landfarm facility.</p>	<p>CIRNAC recommends that Baffinland provide the results of their soil volume review and follow through with the recommendation made by CIRNAC in the 2016 Annual Report review:</p> <p>“We recommend that the licensee specify where they intend to store any new contaminated soil and how they propose to treat or discard the soil presently at the landfarm.”</p>	<p>Noted. An update on the Project’s actions taken in 2018 and plans for managing and treating hydrocarbon impacted soils will be provided in the 2018 Annual Report submission. The 2019 Work Plan includes the addition of a landfarm at the Mary River Mine Site to provide additional capacity at the Project for managing and treating hydrocarbon impacted soils.</p>	March 31, 2019
4. Chemical Dust Suppressant Use and Chloride (Cl ⁻) Monitoring	<p>Baffinland informed CIRNAC last year that the Surface Water and Aquatic Ecosystem Management Plan was being revised and would provide clarity on the monitoring of water bodies for chloride along the Tote Road due to the addition of calcium chloride (CaCl₂) as a dust suppressant. This revised/updated plan was not submitted with the 2017 Annual Report.</p>	<p>CIRNAC recommends that the licensee provide an updated Surface Water and Aquatic Ecosystems Management Plan, which should provide detail on water protection measures for chloride.</p>	<p>Baffinland continues to actively work on revising the Project’s Surface Water and Aquatic Ecosystem Management Plan (SWAEMP) and the Roads Management Plan (RMP) to provide additional clarity on monitoring along the Tote Road. An update on the status of the RMP and SWAEMP will be provided in the 2018 Annual Report submission.</p>	March 31, 2019
5. Potential Cause(s) of ARD/ML Formation at Mine Site Waste Rock Facility	<p>Baffinland identified the development of acid rock drainage/metal leaching (ARD/ML) at the Mine Site waste rock facility as one of the main operational challenges in 2017. In Appendix E.5, Golder seems to suggest that the dissolution of soluble iron sulphate minerals (e.g. melanterite) present in the waste rock is the cause of ARD/ML. However, CIRNAC notes the lack of conclusive evidence in support of this hypothesis and the lack of consideration of alternative causes. Furthermore, should Baffinland consider the presence of soluble iron sulphate minerals in waste rock as the reason for ARD/ML formation, its waste rock geochemical characterization programs and Interim Waste Rock Management Plan will need to be updated accordingly.</p>	<p>CIRNAC recommends that Baffinland undertake a comprehensive investigation to identify the cause(s) of the ARD/ML issue and based on the findings, update its waste rock geochemical characterization programs and waste rock management plan accordingly. Prior to that, Baffinland should update its waste rock geochemical characterization programs and waste rock management plan by including soluble iron sulphate minerals in waste rock as a source of acid drainage.</p>	<p>Noted. Baffinland will provide a response with the 2018 Annual Report submission.</p>	March 31, 2019
6. Uncertainty in Estimate of Tonnages of PAG Waste Rock from Deposit No. 1	<p>CIRNAC notes significant uncertainty in the estimate of the tonnages or proportions of PAG (Potentially Acid Generating) waste rock generated from Deposit No. 1.</p> <p>In the Phase 1 Waste Rock Management Plan, Baffinland predicted that based on its waste rock geochemical characteristic program, approximately 11% of the Life of Mine in-pit waste rock was estimated to be PAG. On the other hand, Table 2.9 of the Annual Report provided the monthly and annual quantities of waste rock generated from Deposit No. 1 in 2017. Among a total of 1,205,666 tonnes of waste rock generated, 348,772 tonnes were classified as PAG, representing about 29%, almost three times the initial estimate.</p> <p>Although Golder has hypothesised that soluble iron sulphate minerals (e.g. melanterite) was the cause of ARD/ML formation at the waste rock facility, the quantity of soluble iron sulphate minerals was not considered in the estimate by the tonnages of PAG to be generated from Deposit No. 1 from February 2018 to April 2019; only sulphide content and NPR (Neutralization Potential Ratio) were considered. Table 1 of Appendix E.5 summarized the prediction: out of total of 3,690,503 tonnes of waste rock to be generated, about 765,246 tonnes would be PAG, about 20.7% which is significantly lower than what was observed in 2017.</p>	<p>CIRNAC recommends that Baffinland update its estimate of the tonnage of PAG waste rock from Deposit No. 1 by also considering soluble iron sulphate minerals in the PAG/Non-PAG classification. CIRNAC would like to see this updated estimate reflected in the updated Waste Rock Management Plan and in next year’s Annual Report.</p>	<p>Noted. Baffinland will provide a response with the 2018 Annual Report submission.</p>	March 31, 2019

Table A-1 - Baffinland Response to Comments - 2017 QIA & NWB Annual Report for Operations

Comment ID and Topic	Comment	Recommendation/Request	Baffinland Response	Due Dates Assigned by NWB ¹
7. Metals Concentrations in Non-Compliant Discharges from Waste Rock Facility	<p>On page 17 of the 2017 Annual Report, Baffinland stated:</p> <p>"During August 2017, the pH of runoff collected in the Waste Rock Facility surface water management pond (WRF pond) dropped below the pH discharge criteria outlined in the MMER and Type A Water Licence. Observations indicated the decrease in pH may have been the result of potential ARD. The pond was subsequently batch treated with sodium carbonate in mid-August 2017 to increase the pH within the permissible range for discharge. Although the batch treatment was initially successful in raising the pH of runoff contained with the pond, subsequent active discharges from the WRF pond during late August and September resulted in several exceedances of the MMER and Type A Water Licence discharge criteria for pH and total suspended solids (TSS). Exceedances for the non-compliant discharges were reported to the relevant regulators and are documented in NT-NU Spill Reports 17-289, 17-312, 17-328 and 17-361."</p> <p>ARD is generally associated with high metal content. In fact, in data included in the Follow-up to the #17-312 update reported on September 27th, 2017 Mary River Project – Water Licence No. 2AM-MRY1325, total nickel concentrations were reported to be 0.634 and 0.674 mg/L for samples taken October 9th and 17th, 2017, respectively, which are above the water licence discharges criterion (i.e. 0.5 mg/L).</p> <p>It is apparent that metal leaching (ML) is also a concern.</p>	CIRNAC recommends that Baffinland acknowledge the metal leaching issue associated with the ARD formation from the Mine Site waste rock facility in an updated Waste Rock Management Plan, and design and implement appropriate management procedures to mitigate this issue.	Noted. Baffinland will provide a response with the 2018 Annual Report submission.	March 31, 2019
8. Incomplete Water Quality Results	<p>CIRNAC notes that many analytical data on water quality are not presented and no reason is given for the partial results. For example, table 5.2.15 presented the water quality results for water licence monitoring location MS-08. Only a few samples have results on the concentrations of most chemical species. As noted in Comment #7 (refer above), metals can also be above the water licence discharge criteria and it is important that such monitoring results are presented in the annual report for review.</p> <p>CIRNAC notes that some groups of parameters must be sampled at different frequencies under Schedule I of the Water Licence, however the missing information does not seem to consistently follow this schedule.</p>	CIRNAC recommends that Baffinland clarify reasons for, and potential implications of, missing data.	Water quality parameters are monitored at a frequency that meets or exceeds the requirements outlined in the Metal & Diamond Mining Effluent Regulations (MDMER) and the Project's Type A Water Licence. As a proactive measure, additional sampling for parameters that can be tested onsite, such as TSS, are collected. Because of this, Baffinland acknowledges that there are sampling events that only monitor for select parameters however water quality monitoring completed at the Project meets the frequency requirements set out in the Type A Water Licence and MDMER.	November 1, 2018
9. Separation of Tables from Relevant Contents in Annual Report	CIRNAC notes that some tables are presented at the end of the Annual Report, rather than near the associated contents. This format made it difficult for the review.	CIRNAC recommends that, where possible, Baffinland present tables and figures closely with the associated contents in future annual reports to facilitate review.	Baffinland disagrees with this approach for formatting future annual reports. The 2017 Annual Report contains over 130 pages of tables. Integrating this volume of tables throughout the text of future annual reports will reduce the readability of the reports.	Subsequent Annual Reports
10. Highlight of Non-Compliance Results in Tables	Water quality results are presented in various tables. It would facilitate the review of non-compliance results were highlighted in the tables.	CIRNAC recommends that Baffinland highlight non-compliance results in the tables in future annual reports.	Non-compliant results were bolded in the 2017 Annual Report. Baffinland will highlight non-compliant results in subsequent annual reports to ease the review of water quality data collected under the Type A Water Licence.	Subsequent Annual Reports
11. Annual Volumes of Water use and Effluent Release Presentation in Tables	The referenced tables presented in the 2017 Annual Report for Operations include the daily and monthly volumes of water and effluent in cubic metres as required in Schedule B of the Water Licence, and the annual volumes can be calculated based on the given monthly values. However, it is inconvenient to calculate the annual volumes.	CIRNAC recommends adding a row or a note at the bottom of the tables indicating the total annual volumes of cubic metres, as was done in other tables under Section 2.	Baffinland will provide tabulated annual volumes for the various monitoring locations in subsequent annual reports.	Subsequent Annual Reports
12. Name change from INAC to CIRNAC	Throughout the document, the previous acronym for Indigenous and Northern Affairs Canada (INAC) is used and should be changed to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) to reflect the current name in all future documentation.	Refer to comment.	Noted	Subsequent Annual Reports
13. Reference to Schedule B, Section b, Condition No. xiii is misfiled.	Schedule B, Section b, Condition No. xiii states that the Annual Report shall contain the following: "the monthly and annual volume in cubic metres of treated Effluent discharged into the marine environment from the Milne Port Ore Stockpile Sedimentation Pond." This information is inserted into Section f PLANS/REPORTS/STUDIES of the Concordance Table in Appendix A. It would aid in the review if the details regarding effluent were grouped with Section b WASTE.	Refer to comment.	Noted. Baffinland will correct this typo in subsequent annual reports.	Subsequent Annual Reports
14. Emergency Response Plan	In Revision 3 of the Emergency Response Plan, CIRNAC contact information is incorrect.	CIRNAC recommends updating the contact information.	Baffinland will update CIRNAC's contact information in the Project's ERP.	March 31, 2019
15. Emergency Response Plan Flow Chart and Acronym Update	Section 2.4, Mine Rescue Team (MRT), has been deleted from Revision 3, and it is clear that the roles of the MRT have been replaced by the Emergency Rescue Team (ERT). However, references to the MRT still appear in the flow charts.	CIRNAC suggests that Baffinland clarify the flow charts by replacing the acronym MRT with the acronym ERT.	Baffinland will revise the flowcharts in the next revision of the Project's ERP.	March 31, 2019
16. Fresh Water Supply, Sewage, and Wastewater Management Plan: Clarification of Discharge Plan	<p>Section 5.4.1 of the Fresh Water Supply, Sewage and Wastewater Management Plan, Baffinland makes reference to the Polishing Waste Stabilization Pond (PWSP) and states: "The PWSP Effluent Discharge Plan is used as a reference guideline by the onsite environmental team. Water quality parameters will be monitored in the spring and a discharge plan will be developed based on the determined water quality conditions."</p> <p>This wording gives the impression that a new Effluent Discharge Plan will be or can be created to accommodate the current effluent conditions. However, through the approved water licence and associated plans only two options for discharge have been approved (Option #1 – Spring Discharge and Option #2 – Summer Polishing Treatment and Discharge).</p>	CIRNAC recommends that Baffinland follow the approved methods for discharge. If these methods cannot be followed then Baffinland would have to submit another approach and/or method to the NWB for review and approval.	Noted. Baffinland will revise the wording in Section 5.4.1 and resubmit a revised Fresh Water Supply, Sewage and Wastewater Management Plan (FWSWMP) with the 2018 Annual Report submission. The revised FWSWMP will clarify that only treatment methods approved by the NWB will be used when discharging effluent from the Project's PWSPs.	March 31, 2019
17. Fresh Water Supply, Sewage and Wastewater Management Plan: Appendices	Appendix G – Mobile Oily Water Separator (OWS) Manual – has been removed, however Appendix F and G of the OWS Manual remain in a separate Appendix. There is also the addition of a table that didn't exist in the previous version, thus it is unclear as to which Appendix this belongs. Thirdly, the page Appendix H – MMER Sampling and Reporting Requirements Memo (Minnow) is repeated, with different content following it each time. These errors make the Appendices difficult to read.	CIRNAC recommends reorganizing Appendices G and H to include the proper content in full.	Baffinland will rearrange the appendices in the revised Fresh Water Supply, Sewage and Wastewater Management Plan, planned to be submitted with the 2018 Annual Report submission.	March 31, 2019

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18. Updates to Snow Management Plan	<p>According to Baffinland in the 2017 Annual Report, “Surface water management during freshet continued to remain a challenge at the Project in 2017. Six (6) unauthorized release of sediment into water bodies near Project sites were reported by Baffinland during freshet 2017.Snow melt mobilizing sediments and contributing to high levels of total suspended solids (TSS) was also a concern in 2016, leading CIRNAC to make the following recommendation in the review of the 2016 Annual Report:</p> <p>“We recommend that the licensee provide the updated snow management plans, as recommended by their consultant, to the NWB. The snow management plans should be reviewed by the Board, as they deal with water management. It may be appropriate to integrate them in the Surface Water and Aquatic Ecosystem Management Plan.”</p> <p>Baffinland agreed to provide an updated Snow Management Plan to the NWB for review and the snow management plan was provided in May of 2018, after the submission of the 2017 Annual Report. Therefore, CIRNAC is including this management plan in the current review.</p> <p>CIRNAC notes that Baffinland made a major change to the locations of the snow stockpiles in the updated Snow Management Plan to aid in the management of snowmelt during freshet. CIRNAC is also aware that the new stockpiling strategy has not yet been implemented, so the effects of this change cannot be assessed at this time. CIRNAC encourages Baffinland to follow through with their commitment to record observations of the snowmelt over the next year, to make adjustments to the placement of these snow stockpiles if need be, and to update the Snow Management Plan accordingly.</p>	<p>CIRNAC recommends that Baffinland incorporate the updated Snow Management Plan for solids control during freshet in the updated Surface Water and Aquatic Ecosystem Management Plan (updating the Surface Water and Aquatic Ecosystem Management Plan is recommended in Comment #4 of Part B of this document).</p>	<p>Baffinland continues to actively work on revising the Project's Surface Water and Aquatic Ecosystem Management Plan (SWAEMP). An update on the status of the SWAEMP will be provided in the 2018 Annual Report submission. The revised SWAEMP will refer to the Snow Management Plan for additional details on the Project's snow management protocols and procedures.</p>	<p>March 31, 2019</p>
19. Document Revision Record of the Snow Management Plan	<p>The most recent date in the Document Revision Record of the Snow Management Plan is recorded as July 5, 2018 rather than May 7, 2018.</p>	<p>CIRNAC recommends updating the dates on the Document Revision Record of the Snow Management Plan to be formatted as MM/DD/YY to keep the dates consistent.</p>	<p>Baffinland will ensure revision date formatting is consistent in future revisions of the Snow Management Plan to avoid confusion of revision dates.</p>	<p>March 31, 2019</p>
ECCC				
1. Potential Onset of Acid Rock Drainage (ARD)	<p>As outlined in the report, in August of 2017 the pH of runoff collected in the Waste Rock Facility (WRF) pond dropped below the regulated pH discharge limits, with subsequent toxicity failures. The decrease in pH may have been the result of acid rock drainage (ARD) occurring. Baffinland Iron Mines Corporation (Baffinland or the Proponent) has retained a consultant to investigate the potential for ARD and develop mitigation measures as required. A water treatment system will be commissioned in early 2018 to treat non-compliant waters in the WRF pond.</p> <p>The drop in pH itself was probably not the cause of the observed toxicity; however, the lower pH changed the form and bioavailability of metals in the effluent, which affected the toxicity. Unfortunately, the chemical characterization of the effluent on the dates that toxicity was observed did not include all the parameters, nor the dissolved fraction for metals, which would help in the interpretation of test results.</p> <p>Waste rock at the site was predicted to be non-acid generating, and thus it has been used as a construction material at the mine site, which warrants further investigation.</p>	<p>ECCC recommends that:</p> <ul style="list-style-type: none">• The Proponent ensure effluent is fully characterized with the full suite of total and dissolved metals analyzed, as well as sulphate, for samples used for bioassay tests. This full characterization should be done periodically for routine sampling.• The Proponent describe the proposed water treatment system, including the parameters and its target effluent quality.• The Proponent develop appropriate mitigation measures to prevent ARD based on the results from the investigation of the cause of the drop in pH.• The Proponent conduct inspections of any construction incorporating the waste rock to identify any detectable ARD onset.	<p>To support the interpretation of bioassay tests in future years, Baffinland will ensure that effluent is fully characterized when bioassay samples are collected.</p> <p>The Waste Rock Facility water treatment plant focuses on the removal of solids and the adjustment of pH. The target effluent quality is the discharge criteria required by MDMER and the Type A Water Licence.</p> <p>A brief description of the water treatment plant process is provided below:</p> <p>The design consists of physical-chemical treatment for converting dissolved metals into precipitates and removing the solids by physical barrier. The water treatment processes include coagulation, pH adjustment and precipitation, flocculation and filtration.</p> <p>The treatment plant process, flow rate, and equipment are analogous to facilities successfully installed and operated at other mines in Canada.</p> <p>Water from the feed pond will be pumped to the first reactor tank and will be mixed by an aeration system. Lime and coagulant (ferric sulfate) solutions will be added and pH adjusted to 8.5 to assist precipitation of heavy metals. The intent of coagulation is to neutralize the electric charge on colloidal particles, and also assist with precipitation of some heavy metals. The coagulated water will flow to the second reactor tank to provide additional mixing and retention time for reactions to occur. The pH adjusted water will flow to the third reactor in which polymer will be added for flocculation. Flocculation will create flocs to assist with the separation of solids and liquids in subsequent stages. The overflow from the third reactor tank will be pumped to geotube and solids filtered via the membrane. The filtered final effluent from the geotubes will collect in sumps and will be pumped for discharge to the environment if compliant with the applicable discharge criteria or recirculated back into the system if effluent does not meet applicable discharge criteria.</p> <p>Baffinland will provide an update to regulators by December 31, 2018 on the ARD mitigation measures planned for the Waste Rock Facility at the Project.</p>	<p>Subsequent Annual Reports - Full characterization of effluent. November 1, 2018 - Describe water treatment plant. December 31, 2018 - Mitigation measures.</p>
2. Sheardown Lake Sedimentation	<p>As in 2016, the 2017 a significant input of sediments in Sheardown Lake when compared to baseline was observed, with increases from the 2014-2015 period as well as sustained inputs compared to the 2016-2017 period at the depositional stations. Sedimentation rates were highest during the open-water period compared to the ice-cover period, representing higher inputs during summer from dust and biological productivity. Total sediment deposited was highest during the ice-cover period, due to the extended duration of ice-cover compared to open water.</p> <p>The deposition depth of sediments ranged from 1.39 to 2.3 mm/year (vs. 1.26 mm/year to 2.02 mm/year in 2016/2017). This is within the range associated with adverse effects on fish egg survival. ECCC acknowledges that effects were not observed in the monitoring of Arctic char; however, sediment deposition rates appear to be trending upwards (Figure 3.1 - 2017 Lake Sedimentation Monitoring Report) and continuing increases are of concern. The 2017 Core Receiving Environment Monitoring Program (CREMP) reports that: “[...] sediment iron concentrations appear to be highest at Sheardown Lake NW stations situated closest to the outlets of SDLT1 and SDLT12 [...] Iron concentrations in deposited sediment at SDLT1 and SDLT12 were considerably higher than sediment of Sheardown Lake NW (Appendix Table D.29), indicating that these tributaries were a source of iron loadings to the lake.”</p> <p>In the three Sheardown Lake sampling sites, sediment iron concentrations were above sediment quality guidelines (noting that the reference lake is also elevated) and above the AEMP benchmarks in many cases. Source contributions may be a combination of surface erosion, dustfall transport in freshet meltwaters or in surface runoff, or direct dust deposition on the lake surface.</p>	<p>ECCC recommends that:</p> <ul style="list-style-type: none">• The Sheardown Lake sedimentation monitoring study continue on an ongoing basis.• Management and mitigation of dust at the Mine Site and Milne Inlet Facility be an ongoing priority for Baffinland.	<p>Noted. Baffinland plans to continue the Lake Sedimentation Monitoring Program in Sheardown Lake NW on an annual basis. Baffinland continues to prioritize the implementation of dust mitigation measures at the Project. Examples of this are the installation of additional shrouding on the operation ore crushers at the Mine Site in 2018.</p>	<p>Subsequent Annual Reports</p>
3. Nitrate Guideline	<p>The reports consistently refer to the Canadian Council of Ministers of the Environment (CCME) guideline for nitrate as 13 mg/L. This is correct, however the data reported in the appendices and use din the report graphs and tables is for nitrate as N. Accordingly, the guideline should be in the same units, and would be 2.93 mg N/L.</p>	<p>ECCC recommends use of the consistent units for nitrogen parameters.</p>	<p>Noted. Baffinland will ensure water quality guidelines and results are expressed in the same units in future annual reports.</p>	<p>Subsequent Annual Reports</p>

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4. Management of Quarry Water	<p>The quarry management plans indicate that, "in the event that water quality at monitoring locations exceed the relevant discharge criteria, additional investigative water sampling will be conducted to identify the source of elevated water quality parameters."</p> <p>However, the plans do not indicate how water that does not meet discharge criteria will be managed. For example, there no indication on how it will be stored or treated in order to achieve acceptable quality for discharge.</p> <p>Monitoring done under the 2017 CREMP has documented changes to the Camp Lake system, with elevated concentrations of copper, iron, nitrate, sulphate, chloride, manganese, molybdenum, sodium and uranium in water, plus elevated arsenic and manganese in sediments of Camp Lake. The source has been linked to active quarrying in the watershed.</p>	ECCC recommends that the Proponent identify how quarry water that is unsuitable for discharge will be managed. This should include potential storage locations and treatment options.	The frequency of water quality exceedances from quarry drainage at the Project has been low and has focused around total suspended solids (TSS). In cases where TSS exceedances were documented, sedimentation mitigation measures were implemented and TSS concentrations returned to acceptable levels. Because sedimentation mitigation measures have shown to be effective at addressing the water quality concerns associated with quarry drainage, contingency infrastructure has not been required at the Project to date. Baffinland will continue to monitor quarry drainage as required by the Project's Type A Water Licence.	November 1, 2018
5. Groundwater Monitoring	Three shallow groundwater wells were established in 2017 to investigate the feasibility of using drive-point piezometers to monitor groundwater quality. The groundwater dataset is extremely limited, and monitoring of the active layer groundwater can be used to characterize sub-surface flows and to provide information about migration of any parameters in the shallow groundwater. Baffinland proposes to continue work on this in 2018. ECCC supports the development of a robust groundwater monitoring plan.	ECCC recommends that the Proponent identify sites which will be monitored beyond the mine site landfill.	Baffinland will provide an update on the groundwater monitoring undertaken at the Project in the 2018 Annual Report submission.	March 31, 2019
QIA				
1. Contact person for Annual Report.	N/A	Confirm Christopher Murray is the correct Baffinland representative to discuss the Annual Report.	Confirmed.	NWB considers this matter to be between Baffinland and the QIA.
2. Lease Operations Guide – Annual Report Tables and Requirements	N/A	<p>To discuss why the mutually agreed upon Tables and Requirements from the Lease Operations Guide were not used in completing the Annual Report submission, specifically:</p> <ol style="list-style-type: none">1. Specified substances quarries and uses.2. Use of water summary.3. Equipment and materials shipped off the property.4. Equipment and materials shipped to and stored on the property.5. Reclamation work performed on the property.6. Findings of non-compliance by a Governmental Authority.7. List of accident reports.8. Additional reports, information or data.	The Lease Operations Guide for the Annual Report was updated and finalized in 2018 to reflect current annual reporting practices.	NWB considers this matter to be between Baffinland and the QIA.
3. Waste Tipped Lease Operations Guide – Survey Methods	N/A	Update the Waste Tipped Lease Operations Guide to include survey methods.	The Lease Operations Guide for Waste Tipping was updated and finalized in 2018.	NWB considers this matter to be between Baffinland and the QIA.
4. Interim Waste Rock Management Plan – Geochemical Evaluation Program	N/A	Provide the scope and, when available, the outcomes of the Geochemical Evaluation Program mentioned in the Interim Waste Rock Management Plan.	This comment will be addressed in the 2018 Annual Report submission.	March 31, 2019
5. Update to Interim Waste Rock Management Plan	N/A	Provide timelines for updating the Waste Rock Management Plan from interim status.	This comment will be addressed in the 2018 Annual Report submission.	March 31, 2019
6. Update to Life-of-Mine Rock Management Plan		Provide when the Life of Mine Waste Rock Management Plan will be updated to reflect the Interim Waste Rock Management Plan	This comment will be addressed in the 2018 Annual Report submission.	March 31, 2019
7. Updated Management Plans	N/A	Upload all updated management plans to IGLU.	This comment has been addressed.	NWB considers this matter to be between Baffinland and the QIA.
8. Acknowledgement of Receipt	N/A	Baffinland's acknowledgement of receipt of this letter.	-	NWB considers this matter to be between Baffinland and the QIA.
NWB				
1a. Dust Suppression Water Sources	Water use for dust suppression from the following water sources was in exceedance: BG50, CV217, CV233 and Camp Lake.	Outline mitigation measures to ensure water use is within allowable values and update relevant management plans.	Personnel involved with water use activities will be retrained in the Project's protocols to ensure water use limits stipulated in the Water Licence are not exceeded in subsequent years. Baffinland will review the mitigation measures outlined in the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (FWSWMP) and provide any updates to the FWSWMP with the 2018 Annual Report submission.	November 1, 2018 - causes and mitigation measures. March 31, 2019 - management plan updates
1b. Water Source CV099 – Low Flow Restrictions	Water source CV099 can be use only during low-flow years.	Was 2017 a low-flow year? If so, please provide data to support the claim.	As per the Type A Water Licence, water withdrawal from CV099 is limited to the months of June and July during low flow years. There are no restrictions for high flow years at CV099. During 2017, water was withdrawn from CV099 during June only.	November 1, 2018
2. OWTS – WQC Exceedances	Report Section 5.2 states that 3 instances of "exceedances of applicable water quality criteria occurred during discharges from Project containment areas in 2017 while using the OWTS".	Outline the causes for the exceedances and mitigation measures. Update relevant management plans.	<p>Exceedances discussed in Section 5.2 of the 2017 Annual Report included one (1) TSS exceedance and two (2) total lead exceedances.</p> <p>Potential causes for the TSS exceedance include the resuspension of sediments resulting from sampling error or the treatment process (i.e. sediment suspension due to movement of treatment components).</p> <p>Both total lead exceedances were minor in nature and were within one order of magnitude of the applicable water licence criterion (0.001 mg/L). Exceedances may have been due to analytical limitations resulting from the close proximity of the water licence criterion to the total lead minimum detection limit published by accredited laboratories, which ranges from 0.0005 to 0.0001 mg/L.</p> <p>In all cases, upon receiving the results, discharge of effluent was stopped until samples of treated effluent from the OWTS could be collected and demonstrated to be in compliance with the applicable water quality criteria stipulated in the Type A Water Licence. To mitigate similar exceedances from reoccurring in the future, Baffinland will ensure personnel collecting samples are fully trained in proper sampling techniques and operation of the OWTS. Baffinland will review the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (FWSWMP) and update OWTS operation protocols if required. Any updates to the Project's FWSWMP will be provided with the 2018 Annual Report submission.</p>	November 1, 2018 - causes and mitigation measures. March 31, 2019 - management plan updates
3. Deposit No. 1 Monitoring Locations	N/A	Echoing CIRNAC No. 1, please justify the decisions to NWB. Please refrain from designating any station inactive or decommissioned without NWB's approval.	<p>Both MS-MRY9 and MS-MRY-10 were established during the 2008 Bulk Sampling Program and Exploration Phase of the Project. Expansion of infrastructure in the area of Deposit No. 1 has resulted in the lack of flows at these monitoring stations. Because of this, these stations have become inactive. Baffinland plans to relocate these monitoring locations and will provide a formal request to the NWB to relocate these monitoring locations in the 2018 Annual Report submission.</p> <p>Baffinland will refrain from decommissioning or designating monitoring stations inactive without the NWB's approval in the future.</p>	November 1, 2018

Table A-1 - Baffinland Response to Comments - 2017 QIA & NWB Annual Report for Operations

Comment ID and Topic	Comment	Recommendation/Request	Baffinland Response	Due Dates Assigned by NWB ¹
4. Visible Inspection for Oil & Grease	N/A	Add “Yes/No Visible Sheen” option to the measurement of oil and grease in a sample, in line with the licence requirements, in subsequent Annual Reports.	Noted. A “Yes/No Visible Sheen” option for the measurement of oil and grease in water samples will be incorporated into subsequent annual reports.	Subsequent Annual Reports
5. Waste Rock Facility Inspections	Seepage from the Waste Rock Facility was discovered only on August 23, 2017, by CIRNAC and ECCC during a site inspection. There was a significant time lapse between the measurement of low pH and determining that there was seepage and only upon the intervention of government agencies.	Update the relevant management plans by including a requirement for unplanned inspections by an Engineer in case of encountering abnormal conditions.	<p>Baffinland will update relevant management plans to include the requirement for an unplanned inspection by an Engineer in cases where abnormal conditions at the Waste Rock Facility are encountered. Updated management plans will be provided with the 2018 Annual Report submission.</p> <p>It should be noted that the occurrence of low pH observed in early August 2017 and the seepage discovered in late August 2017 are believed to be independent of each other (mutually exclusive events).</p>	March 31, 2019
6. Geotechnical Inspection Reports	N/A	Close off several outstanding items listed for follow-up in the Geotechnical Inspection Reports.	Table A-2 outlines the status of each of the items identified during the 2017 Biannual Geotechnical Inspection Reports. As shown in Table A-2, the majority of the items identified have since been addressed.	November 1, 2018
7. Searchable Documents in Annual Reports	N/A	Provide searchable documents in subsequent Annual Reports.	Noted. Baffinland will endeavour to provide searchable documents in subsequent annual reports.	Subsequent Annual Reports
8. Waste Rock Facility Water Treatment Plant – Operation Manual	Appendix E.5, Section 4.4 designates that the water treatment system operator to follow the manual but lists the manual as “under development”.	Develop the manual and update relevant management plans.	Noted. Baffinland will provide the manual for the Waste Rock Facility Water Treatment Plant with the submission of the 2018 Annual Report.	March 31, 2019
9. TSS Exceedances	There were numerous TSS exceedances events throughout the year.	Outline the causes for the exceedances and mitigation measures. Update relevant management plans.	<p>During 2017, TSS exceedances mainly occurred during freshet and at the Waste Rock Facility (WRF).</p> <p>Causes of the TSS exceedances during freshet and the corrective actions taken are documented and discussed in the Freshet Reports No. 1 & 2 (Appendix E.10). Actions taken in 2018 to prevent TSS exceedances from reoccurring during freshet in subsequent years included the following:</p> <p>a. Continued implementation of culvert repairs and drainage upgrades at Project sites and along the Tote Road to improve water quality of surface water drainage.</p> <p>b. Receipt of approval from the NWB to upgrade the Milne Port water management infrastructure (Mod. Req. No. 7) and expand the Milne Port Ore Stockpile surface water management ponds (Mod. Req. No. 9).</p> <p>TSS exceedances that occurred at the WRF surface water management pond in 2017 were caused by a combination of sediment ladened influent into the WRF pond and complications associated with the in-situ pH adjustment of the pond. Corrective actions taken in 2018 to mitigate TSS exceedances at the WRF in future years included the installation and operation of a dedicated water treatment plant to treat all collected runoff at the WRF. The lack of TSS exceedances at the WRF during 2018 is evidence of the water treatment plant’s effectiveness in ensuring compliance with the applicable water quality discharge criteria, stipulated by the Type A Water Licence.</p> <p>Baffinland will continue to update the Project’s management plans to reflect changes in Project infrastructure and protocols. Any updates to the Project’s management plans will be provided to the NWB with the 2018 Annual Report submission.</p>	<p>November 1, 2018 - causes and mitigation measures.</p> <p>March 31, 2019 - management plan updates</p>

Notes:

¹NWB. (2018) Licence No. 2AM-MRY1325 Type “A”; Mary River Project, Baffinland Iron Mines Corporation; 2017 Annual Report Review

Table A-2 - 2017 Bi-Annual Geotechnical Inspection Recommendations and Observations

Geotechnical Inspection	Project Site	Structure	Recommendation/Observation	Status
August 2017 October 2017	Mine Site	Enviro Tank Storage (MS-HWB-1)	We [Barry Martin] recommend that the geotextile over the liner be checked and the granular cover be made good prior to continuing use of this cell.	Baffinland continues to not use this containment cell and plans to decommission the cell in the future.
October 2017	Mine Site	Waste Rock Stockpile Pond (MS-08)	When weather permits, the integrity of the existing pond should be restored.	On June 26, 2018, Baffinland submitted a Water Licence Modification Request (No. 8) to repair and expand the Waste Rock Facility's (WRF) surface water management pond. On September 12, 2018, the NWB approved Water Licence Modification Request No. 8 via Motion 2018-A1-015. Construction of the WRF surface water management pond began in September 2018 and remains ongoing.
August 2017	Mine Site	Crusher Pad Drainage Containment	The conduit under the road at the north end should be sealed and revisions made to direct water from this area to the catchment ditch.	This concern has been addressed.
August 2017	Mine Site	Hazardous Waste Containment (MS-HWB-6)	We [Barry Martin] have no recommendations with respect to this structure other than making repairs to the damaged enviroliner.	This concern has been addressed.
August 2017 October 2017	Milne Port	Landfarm Containment (MP-04)	We [Barry Martin] recommend that the remaining dyke structure without protective cover over it be covered as per the design drawings. This however, is not an absolute requirement.	Baffinland will cover the exposed liner around the perimeter of landfarm by July 2019.
August 2017 October 2017	Milne Port	Milne Port Ore Stockpile Sedimentation Pond East (MP-05)	We [Barry Martin] recommend review of the use of a ballast (possibly tires) on the exposed liner at the dyke to prevent wind uplift.	This concern has been addressed.
August 2017 October 2017	Milne Port	Milne Port Ore Stockpile Sedimentation Pond East (MP-06)	We [Barry Martin] have no concerns other than that of possible wind damage to the liner and recommend the use of tires as ballast.	This concern will be addressed by the end of 2018.
August 2017	Milne Port	Loading Area Contaminated Storage (MP-HWB-1)	We [Barry Martin] have no recommendations with respect to this structure other than to repair the tear identified.	Baffinland will repair the torn liner by the end of June 2019. In the meantime, stormwater and snowmelt in the berm will not be allowed to reach the height of the tear.
October 2017	Tote Road	Bridge Abutments	I [Barry Martin] recommend reconstruction of the abutment formed with metal containment utilizing double the length parallel to the road and 50% wider containment.	Baffinland completed work on all 4 bridges during the winter of 2017/2018 to address concerns identified by ACROW Ltd (ACROW). Additional work is planned for the 2018/2019 winter.