November 1, 2018

Assol Kubeisinova
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RE: Baffinland Response to Comments
Km 107 Run of Mine Stockpile and Sedimentation Pond
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)[1] and Crown Indigenous Relations and Northern Affairs Canada (CIRNAC)[2] in regards to Baffinland's notification submitted to the Nunavut Water Board (NWB) detailing Baffinland's construction of the Run of Mine Stockpile and Sedimentation Pond at the Mine Site.

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,

Christopher Murray
Environmental & Regulatory Compliance Manager

Attachments:

Attachment 1: Baffinland Response to Comments

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

[1] QIA (2018). Issued for Construction Drawings Submission for Run of Mine Stockpile and Sedimentation Pond, Mary River Project – Type 'A' Water Licence 2AM-MRY1325 – Amend. No. 1. October 8, 2018.
[2] CIRNAC (2018). Crown Indigenous Relations and Northern Affairs Canada's comments on Baffinland Iron Mines Corporation's Notification of Planned Construction Work, Mary River Run of Mine Stockpile and Sedimentation Pond, Mary River Project (Water Licence 2AM-MRY1325 – Amendment No. 1). October 5, 2018.

Baffinland

Attachment 1

Baffinland Response to Comments

Baffinland

Table A-1 - Baffinland Response to Comments - Km 107 Run of Mine Stockpile and Sedimentation Pond

ID	Comment / Recommendation	Baffinland Response
	CIRNAC	
1	Comment: CIRNAC reads in the Design Brief that "The Sedimentation Pond configuration has been developed assuming that the pond is empty when the 10 year rainfall event occurs" and that "The Sedimentation Pond will need to be emptied in a timely manner following a storm event or during freshet such that the pond is empty during normal operating conditions." In the Design Brief, it is conversely stated that "When a liner is left exposed, there is potential for degradation of the liner due to UV exposure and physical damage from ice in the pond or falling rock from the adjacent KM107 Stockpile. As such, the pond should only be drained below the spillway invert when there is no ice present." If the pond needs to be completely empty to be able to handle a 10-year rainfall event, then it does not have the capacity for the 10-year rainfall event. Severe weather events are generally difficult to predict accurately, and this is especially a concern because emptying the pond takes time. Further, from these contradicting statements it is not clear when the pond should be drained. Recommendation: CIRNAC recommends that Baffinland clarify the sedimentation pond water draining issue identified above. CIRNAC also recommends that Baffinland incorporate the possibility for the pond to be filled during a 10-year rainfall event into the design of the pond so that it has sufficient capacity for the 10-year rainfall event.	Consistent with the approved Civil Design Criteria for the Mary River Project, the sedimentation pond associated with the Run of Mine Stockpile is designed to contain the 10 year rainfall event. As with the existing sedimentation ponds at the Mary River Project, this pond is designed to be emptied once water contained within meets the applicable discharge criteria. While severe weather events are hard to predict, the likelihood of successive 10 year rainfall events is excessively small by definition. Regarding concerns on the management and pumping of the pond, it should be noted that anecdotal evidence suggests the summer of 2018 had the greatest summer precipitation since the start of operations at Mary River, yet all ponds at the Project were adequately managed and did not experience any issues with capacity or the ability to contain these rainfall events.
2	Comment: On drawing 320, it is not clear which areas of the sedimentation pond correspond to the provided detail C. Recommendation: CIRNAC requests that Baffinland clarify and confirm areas of the sedimentation pond corresponding to the provided Detail Con Drawing 320.	Detail C corresponds to the area of coarse riprap apron at the influent area of the pond, in the northeastern corner of the pond. A note is present in the Plan view on Drawing 320 indicating "See Detail C for Geomembrane Anchoring Details".
3	Comment: This infrastructure is not included in the 2018 work plan and reclamation security for this specific activity is not in place. As construction cannot commence before security has been posted for this infrastructure the proposed project will need to be identified in the work plan for upcoming annual security review.	As indicated in the September 21, 2018 submission, Baffinland acknowledges that this infrastructure was not included in the 2018 Work Plan or 2018 Work Plan Addendum. While a Work Plan addendum and security estimate could be pursued to address this gap, given the proximity to the 2019 Work Plan submission and ASR process, Baffinland believes reconciling this activity in the 2019 Work Plan is a suitable alternative. Therefore, this facility is included in the 2019 Work Plan and associated 2019 Marginal Closure and Reclamation Financial Security Estimate. Additionally, as Baffinland has not executed the earthworks associated with the Milne Port Laydowns outlined in the 2018 Work Plan (with the exception of Laydown 7), Baffinland is over-bonded with respect to earthworks in 2018. As a result, in the event reclamation of the earthworks associated with the ROM Stockpile would be required prior to the end of 2018, adequate security would be in place to complete the reclamation.
4	Comment: CIRNAC notes that an assumption is made in the design of the Access Road on the depth of the overburden before bedrock is encountered. Because understanding the depth of the bedrock is essential to constructing a structurally sound road, CIRNAC would like to know how Baffinland plans to ensure that their designs match the true field conditions. Recommendation: CIRNAC recommends that Baffinland have a qualified engineer field check the design assumptions to ensure the design assumptions match the field conditions.	As stated in Section 6.10 of the design brief, a qualified Baffinland engineer will oversee and document construction.

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Table A-1 - Baffinland Response to Comments - Km 107 Run of Mine Stockpile and Sedimentation Pond

ID	Comment / Recommendation	Baffinland Response
5	Comment: The ROM Stockpile Infrastructure outlined in the Notification of Planned Construction Work for the Run of Mine Stockpile and Sedimentation Pond are planned to be built on a steep slope. Placing a heavy load on unconsolidated ground conditions on a slope could result in landslides, slumping of slopes, or otherwise jeopardize the structural integrity of Stockpile Infrastructure. These ground conditions can change rapidly (such as seasonal changes, daily weather, rapid spring thaw) or over time. It is clear in the Design Report that load calculations for Stockpile Infrastructure incorporate the weight of the Access Road, the Sedimentation Pond at maximum filling elevation, and the Stockpile Berms. However, it is not clear if the weight of the ore in the Stockpile itself was incorporated into this calculation. Recommendation: CIRNAC recommends that the weight of the Ore Stockpile be incorporated into the load calculations.	A slope stability analysis will be performed including the ore stockpile portion for the Run of Mine Stockpile. The analysis will be submitted to the NWB prior to any ore placement at the Run of Mine Stockpile.
6	Comment: CIRNAC notes from the Construction Drawings that a berm will be constructed around the ROM Stockpile. CIRNAC is concerned about the possibility of pooling water in the most southerly section of the Ore Stockpile Berm. General flow direction arrows in the "For Construction Drawings" indicate that water will flow towards the berm rather than along the berm. Diversion ditches, on the other hand, could be graded and direct flow to the Sedimentation Pond more efficiently. CIRNAC reads in the Design Brief, "Construction of each berm will result in the formation of a channel between the berm and the stockpile, or the berm and the natural ground slope. Where existing ground conditions permit, natural overburden material may be excavated to form part of the channel and any suitable excavated material used to form the berm." No design drawings were submitted indicating the channel designs. It is not clear whether these channels will be graded to encourage the flow of drainage water to the Sedimentation Pond. Recommendation: CIRNAC recommends Baffinland provide the NWB with the details of the channels to be constructed prior to construction to ensure that they are fit to prevent pooling.	The berms (and ditches that form between them and the stockpile) will have a minimum grade of 0.2 % as listed in the Design Criteria table (Table 1) for Ditch Parameters and will direct all runoff to the Sedimentation Pond by gravity. Water will generally flow away from the stockpile, towards the diversion berms, and then along the diversion berms towards the sedimentation pond.
	QIA	
1	Comment: General omission. Recommendation: Can the NWB confirm if a geotechnical site investigation and a slope stability analysis is needed for the run of mine stockpile? If yes, will it be included under a separate cover and Water Licence submission process?	A slope stability analysis will be performed including the ore stockpile portion for the Run of Mine Stockpile. The analysis will be submitted to the NWB prior to any ore placement at the Run of Mine Stockpile.
2	Comment: Baffinland Letter. As this infrastructure was not included in the 2018 Work Plan or 2018 Work Plan Addendum, reclamation security for this specific activity is currently not in place. While a Work Plan addendum and security estimate could be pursued to address this gap, given the proximity to the 2019 Work Plan submission and ASR process, Baffinland believes reconciling this activity in the 2019 Work Plan is a suitable alternative. Therefore, this facility will be included in the 2019 Work Plan and associated 2019 Marginal Closure and Reclamation Financial Security Estimate. Baffinland has estimated the total reclamation cost of this facility to be approximately $250,000. Recommendation: Baffinland is not to begin construction on Inuit Owned Land until sufficient reclamation security is in place for activities that create new liability on Inuit Owned Land.	Baffinland has included the Run of Mine Stockpile and Sedimentation Pond in the 2019 Work Plan and associated 2019 Marginal Closure and Reclamation Financial Security Estimate.

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Table A-1 - Baffinland Response to Comments - Km 107 Run of Mine Stockpile and Sedimentation Pond

ID	Comment / Recommendation	Baffinland Response
3	Comment: Baffinland Letter. Additionally, as Baffinland has not executed the earthworks associated with the Milne Port Laydowns outlined in the 2018 Work Plan (with the exception of Laydown 7), Baffinland is over-bonded with respect to earthworks in 2018. As a result, in the event reclamation of the earthworks associated with the ROM Stockpile would be required prior to the end of 2018, adequate security would be in place to complete the reclamation. Recommendation: Baffinland is not to begin construction on Inuit Owned Land until sufficient reclamation security is in place for activities that create new liability on Inuit Owned Land.	Baffinland has included the Run of Mine Stockpile and Sedimentation Pond in the 2019 Work Plan and associated 2019 Marginal Closure and Reclamation Financial Security Estimate.
4	Comment: Design Brief Section 4.7 Diversion Berms. The Diversion Berms were sized by treating the space between the berm's upstream slope and the stockpile slope (or the natural ground) as the two sides of a trapezoidal channel, with a base width of approximately 0.5 m. A freeboard depth of 0.3 m was included in the berm sizing to account for minor variations in the berm cross section and grade following construction. Recommendation: Does the NWB consider the information provided is enough to confirm that the diversion berms are able to collect all runoff water from the Run of Mine Stockpile and demonstrated reporting on how it will meet Water Licence criteria? It is unclear if the water from the Run of Mine Stockpile is considered effluent from the perspective of MMER. QIA believes this water should be considered effluent under the Water Licence and needs to be managed and demonstrated to be within Licence compliance limits prior to discharge.	Details on the design of the diversion berms is included in the Knight Piésold Issued For Construction Drawings 320 and 321. Berms have been adequately sized to contain and direct all runoff from the Run of Mine Stockpile. As per the Project's Type A Water Licence all discharge from the Run of Mine Stockpile sedimentation pond will meet effluent quality limits set out in Part F, Item 24 prior to discharge. Run off water from the stockpile will report to the sedimentation pond. Baffinland considers this Facility subject to the Metal and Diamond Mining Effluent Regulations and will notify ECCC prior to use of the Facility.
5	Comment: Design Brief Section 5.3 Materials and Parameters. This generalized stratigraphy has been adopted for the stability analysis. The thickness of the Glacial Till layer is not known and is expected to range from 0 m to greater than 10 m. The strength of the foundation is expected to increase with depth through the permafrost and into the bedrock. It is likely that the strength of the upper till layers within the active zone will control the stability of the embankments. As such, the stability models incorporate thick zones of Glacial Till and evaluated the FoS for potential slip surfaces through the Glacial Till layer only. The stability models assume that the Glacial Till consists of well graded Sand and Gravel, and that massive ice is not present. Recommendation: Baffinland to confirm if a geotechnical investigation of the subsurface has been completed in the vicinity of the proposed construction that can substantiate if this assumption is reasonable?	A slope stability analysis will be performed including the ore stockpile portion for the Run of Mine Stockpile. The analysis will be submitted to the NWB prior to any ore placement at the Run of Mine Stockpile. Consideration will be given to conducting a geotechnical investigation in support of the stability analysis.
6	Comment: Design Brief Section 5.4 Results. Slow, steady creep of the Access Road and Sedimentation Pond embankments may occur if the ice rich materials or massive ice are present within the foundation soils. As such, regular monitoring is required to track the deformation and movement of the embankments, if any. Additional fill placement and surface grading may be necessary depending on the magnitude of the observed deformations. Recommendation: Baffinland to confirm how they plan to include this in a monitoring plan or document to capture the need to collect and analyze this geotechnical information?	The Facility will be included in the Biannual Geotechnical Inspections required by the Type A Water Licence. Should the Biannual Geotechnical Inspections indicate that additional monitoring or instrumentation is required, Baffinland will provide details of this monitoring in the Annual Report.

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ID	Comment / Recommendation	Baffinland Response
7	Comment: Design Brief Section 6.4 Foundation Preparation. It is unknown whether the foundation soils are ice rich or contain massive ice. For the purposes of this design, we assume that the foundation materials are not ice rich and do not contain massive ice. Provided that the amount of organics and unsuitable material on the ground surface is negligible, disturbance to the original ground (excavation, scarifying, etc.) should be minimized so as to not impact current permafrost conditions. The foundations must be maintained clear of snow, ponded water and ice. Recommendation: Baffinland to include confirmation drilling to assess foundation stability, ice richness, and the presence of massive ice.	A slope stability analysis will be performed including the ore stockpile portion for the Run of Mine Stockpile. The analysis will be submitted to the NWB prior to any ore placement at the Run of Mine Stockpile. Consideration will be given to conducting a geotechnical investigation in support of the stability analysis.
8	Comment: Design Brief Section 6.4 Foundation Preparation. The foundation must be approved and documented by the supervising Engineer prior to fill placement. Recommendation: Baffinland to include this information in as-built documentation.	Noted. Baffinland will include this information in the Construction Summary Report.
9	Comment: Design Brief Section 6.10 Construction Quality Assurance/Quality Control (QA/QC). It is assumed that a qualified Baffinland engineer will oversee and document construction of the Access Road, Sedimentation Pond and associated runoff management measures Geosynthetic materials and culverts will be installed as per the manufacturer's specifications and recommendations. The geosynthetics contractor will be responsible for performing and documenting the geosynthetics QC program. Qualified Baffinland personnel will be responsible for conducting the QC testing and inspections required on all placed and compacted fill materials Recommendation: Baffinland to include each outcome from each of these in the as-built documentation. Baffinland to provide the frequency and type of QC testing and inspection required on all placed and compacted fill materials.	Construction QA/QC specifications are the sole responsibility of Baffinland to commission and implement, and are not a requirement of the Type A Water Licence 2AM-MRY1325 or the Commercial Lease Q13C301. Baffinland retains all risk and liability for the construction of infrastructure at the project, and does not consider QIA review and approval of construction QA/QC to be warranted. Baffinland will prepare a Construction Summary Report, per the Type A Water Licence Part D, Item 17.
10	Comment: Design Brief Section 7.0 Inspections and Maintenance. KM107 Stockpile material placement and runoff management will need to be closely monitored during operation of the stockpile area, including use of the Access Road, and operation of the Sedimentation Pond and runoff management measures. The Sedimentation Pond will need to be emptied in a timely manner following a storm event or during freshet such that the pond is empty during normal operating conditions. Ongoing inspections and maintenance will be required to ensure that each of these structures are being operated as designed and that the Diversion Berms, culverts, and Sedimentation Pond water removal system and emergency overflow spillway are performing as designed. Recommendation: Recommended that the Sedimentation Pond be equipped with survey prisms for deformation monitoring. This data would need to be reviewed and assessed by a qualified professional engineer for performance suitability.	The Facility will be included in the Biannual Geotechnical Inspections required by the Type A Water Licence. Should the Biannual Geotechnical Inspections indicate that additional monitoring or instrumentation is required, Baffinland will provide details of this monitoring in the Annual Report.

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11	Comment: Design Brief Section 4.3 Dam Classification The Sedimentation Pond is classified as a LOW consequence structure (CDA, 2007) based on the following criteria… The CDA recommends that LOW consequence dams be designed based an annual exceedance frequency of 1 in 100 years for flood and earthquake hazards. Design Brief Loading Conditions and Target Factors of Safety The Sedimentation Pond is classified as a dam following the Canadian Dam Association Dam Safety Guidelines (CDA, 2007 and 2013). Design Brief Section 7.0 Inspections and Maintenance. Inspect the water removal system from the Sedimentation Pond (designed by others) to ensure each component is performing as designed Recommendation: The Sedimentation Pond is considered a dam, as per CDA Section 3.23, which requires an OMS and subject to dam safety review. These are conditions of acceptance of this design.	Baffinland's Fresh Water Supply, Sewage, and Wastewater Management Plan will be updated to include the Run of Mine Stockpile Facility (MS-07). This will include frequency and content of inspections for the Facility.