



ᖃᖃᖃᖃᖃᖃᖃᖃ
ᖃᖃᖃᖃᖃᖃᖃᖃᖃᖃ

Serving the
communities of

ᖃᖃᖃᖃᖃᖃᖃᖃ
Arctic Bay

ᖃᖃᖃᖃᖃᖃᖃᖃ
Cape Dorset

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Clyde River

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Grise Fiord

ᖃᖃᖃᖃᖃᖃᖃᖃ
Hall Beach

ᖃᖃᖃᖃᖃᖃᖃᖃ
Igloolik

ᖃᖃᖃᖃᖃᖃᖃᖃ
Iqaluit

ᖃᖃᖃᖃᖃᖃᖃᖃ
Kimmitut

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Pangnirtung

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Pond Inlet

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Qikiqtarjuaq

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Resolute Bay

ᖃᖃᖃᖃᖃᖃᖃᖃᖃ
Sanikiluaq

November 9, 2018

Assol Kubeisinova
Technical Advisor, Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

Re: 2AM-MRY1325 BIM Response to comments Construction Drawings Submission Run of Mine Stockpile and Sedimentation Pond

Dear Assol Kubeisinova,

This letter represents the Qikiqtani Inuit Association's (QIA) response to the Nunavut Water Board (NWB) request¹ if Baffinland Iron Mine Corporation's (Baffinland) submission² has addressed QIA's previous comments submitted³ for the Run of Mine Stockpile and Sedimentation Pond.⁴ The NWB requested responses be submitted by November 9, 2018.

QIA's assessment to the responses provided by Baffinland are summarized in Table 1 attached to this letter.

QIA is willing to discuss this letter and the Lease obligations with you and your staff at a time that is mutually agreeable.

Sincerely,

Fai Ndofor
Regulatory Manager

¹ NWB (2018). Email titled: 2AM-MRY1325 BIM Response to comments Construction Drawings Submission Run of Mine Stockpile and Sedimentation Pond. Sent by Richard Dwyer November 2, 2018.

² Baffinland (2018). 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. November 1, 2018.

³ QIA (2018). Issued for Construction Drawings Submission for Run of Mine Stockpile and Sedimentation Pond, Mary River Project - Type 'A' Water Licence 2AMMRY1325 – Amend. No. 1. October 8, 2018.

⁴ Baffinland (2018). Issued for Construction Drawings Submission Run of Mine Stockpile and Sedimentation Pond Mary River Project - Type 'A' Water Licence 2AM-MRY1325 - Amend. No. 1. September 21, 2018.



ᑎᑎᕐᑲᑯᑦᑭᑦ P.O. Box 1340
ᑕᕐᑲᑯᑦᑭᑦ, ᓄᓇᑐᕐᑭᑦ Iqaluit, Nunavut
X0A 0H0

Serving the
communities of

Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
1	<p>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?</p>	<p>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.</p>	<p>QIA considers Baffinland response satisfactory, confirming that a slope stability analysis will be performed. However, the slope stability analysis is to be performed prior to, so that results may be included in, the design. QIA believes that this should be captured to ensure Water Licence Part D, Item 16 requirements are met then reported as per Water Licence Part D, Item 17.</p>
2	<p>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</p>	<p>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.</p>	<p>QIA considers Baffinland response satisfactory. However, 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, subject to Article 9.2 of the Commercial Lease.</p>



ᐱᐱᓐᓐᓐᓐᓐ P.O. Box 1340
ᐃᓐᓐᓐᓐᓐ, ᓐᓐᓐᓐᓐ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
	<p>\$250,000.</p> <p>Recommendation:</p> <p>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.</p>		
3	<p>Comment:</p> <p>Baffinland Letter.</p> <p>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.</p> <p>Recommendation:</p> <p>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.</p>	<p>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.</p>	<p>QIA considers Baffinland's response satisfactory. However, 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, subject to Article 9.2 of the Commercial Lease.</p>



ᑎᑎᕐᑲᑯᑦᑲᑦ P.O. Box 1340
ᑃᕐᑲᑯᑦᑲᑦ, ᓄᓇᑐᕐᑲᑦ Iqaluit, Nunavut
X0A 0H0

ᐱᓂᕈᐅᑦ
Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
4	<p>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.</p>	<p>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.</p> <p>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.</p> <p>Baffinland considers this Facility subject to the Metal and Diamond Mining Effluent Regulations and will notify ECCC prior to use of the Facility.</p>	<p>QIA considers Baffinland's response satisfactory.</p>



ᐱᐱᖃᖃᖃᖃᖃ
ᓄᓇᖃᖃᖃ ᐃᓄᓄᖃᖃ

Serving the
communities of

- ᐃᖃᐱᖃᖃᖃ Arctic Bay
- ᐅᓇᖃᖃᖃ Cape Dorset
- ᖃᖃᖃᖃᖃᖃ Clyde River
- ᐱᖃᖃᖃᖃᖃ Grise Fiord
- ᖃᓄᖃᖃᖃ Hall Beach
- ᐃᖃᖃᖃᖃ Igloolik
- ᐃᖃᖃᖃᖃ Iqaluit
- ᐅᖃᖃᖃᖃ Kimmirut
- ᐱᖃᖃᖃᖃᖃ Pangnirtung
- ᖃᖃᖃᖃᖃᖃ Pond Inlet
- ᖃᐅᖃᖃᖃᖃᖃ Qikiqtarjuaq
- ᖃᖃᖃᖃᖃᖃᖃ Rolute Bay
- ᖃᓄᐅᖃᖃᖃ Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
5	<p>Comment:</p> <p>Design Brief Section 5.3 Materials and Parameters.</p> <p>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.</p> <p>Recommendation:</p> <p>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?</p>	<p>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.</p>	<p>QIA maintains that a geotechnical investigation is required to support a slope stability analysis and therefore warranted.</p>
6	<p>Comment:</p> <p>Design Brief Section 5.4 Results.</p> <p>Slow, steady creep of the Access Road and Sedimentation Pond embankments</p>	<p>The Facility will be included in the Biannual Geotechnical Inspections required by the Type A Water Licence. Should the Biannual Geotechnical</p>	<p>QIA considers Baffinland's response to be unsatisfactory to the original comment. No additional details were provided that allow for a further</p>



ᑎᑎᕐᑲᑯᑦᑲᑦ P.O. Box 1340
ᑃᕐᑲᑯᑦᑲᑦ, ᓄᓇᑐᕐᑲᑦ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

⁶ Canadian Dam Association (2014) Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams. Section 3.2. 2014.



ᑎᑎᕐᑲᑯᑦᑭᑦ P.O. Box 1340
ᑕᕐᑲᑯᑦᑭᑦ, ᓄᓇᑐᕐᑭᑦ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

⁷ QIA and Baffinland (2018). Construction Summary Report (As-Built Reports). September 2018.



ᑎᑎ^ᓃᑲᑲᑦᑯᑦ P.O. Box 1340
ᐃ^ᓃᑲᑐᐃ^ᓃ, ᑳᑳᑳ^ᓃ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
	<p>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</p> <p>Recommendation: Baffinland to include each outcome from each of these in the as-built documentation.</p> <p>Baffinland to provide the frequency and type of QC testing and inspection required on all placed and compacted fill materials.</p>	<p>QA/QC to be warranted.</p> <p>Baffinland will prepare a Construction Summary Report, per the Type A Water Licence Part D, Item 17.</p>	



ᑎᑎᕐᑲᑯᑦᑭᑦ P.O. Box 1340
ᑕᕐᑲᑯᑦᑭᑦ, ᓄᓇᑐᕐ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
10	<p>Comment:</p> <p>Design Brief Section 7.0 Inspections and Maintenance.</p> <p>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.</p> <p>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.</p> <p>Recommendation:</p> <p>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.</p>	<p>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.</p>	<p>QIA considers Baffinland's response to be unsatisfactory to the original comment. No additional details were provided that allow for a further assessment of the design/operations of the facility. Per the Canadian Dam Association, the owner of the dam should also be monitoring the structure, and not rely solely on a third party geotechnical inspection.^{5 6}</p>



ᑎᑎ^ᓃᑲᑲᑦᑯᑦ P.O. Box 1340
ᐃ^ᓃᑲᑐᐃ^ᓃ, ᑳᑭᑦ Iqaluit, Nunavut
X0A 0H0

Sanikiluaq

ID	QIA October 8, 2018	Baffinland November 2, 2018	QIA November 9, 2018
11	<p>Comment:</p> <p>Design Brief Section 4.3 Dam Classification</p> <p>The Sedimentation Pond is classified as a LOW consequence structure (CDA, 2007) based on the following criteria...</p> <p>The CDA recommends that LOW consequence dams be designed based an annual exceedance frequency of 1 in 100 years for flood and earthquake hazards.</p> <p>Design Brief Loading Conditions and Target Factors of Safety</p> <p>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.</p> <p>Inspect the water removal system from the Sedimentation Pond (designed by others) to ensure each component is performing as designed</p> <p>Recommendation:</p> <p>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.</p>	<p>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.</p>	<p>QIA considers Baffinland's response to be satisfactory. The approval of the updated Fresh Water Supply, Sewage, and Wastewater Management Plan based on the Run of Mine Stockpile Facility should be obtained prior to operation of the Facility.</p>