

October 30, 2015

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Re: Submission of the updated Aquatic Effects Monitoring Plan in accordance with Part I, Item 2 of the Amendment No. 1 of the Type A Water Licence, 2AM-MRY1325

Dear Phyllis,

In accordance with Part I, Item 2 of the Amendment No.1 Type A Water Licence 2M-MRY1325 please find attached to this letter the updated Aquatic Effects Monitoring Plan for your review (Attachment A). In addition Baffinland has provided responses to comments received on June 26, 2015 from all parties on the preceding version (Rev 0) of the Aquatic Effects Monitoring Plan.

- 1) Attachment A: Updated Aquatic Effects Monitoring Plan Rev 1
- 2) Attachment B: Baffinland Responses to Agency Comments received on the June 26, 2015 on Aquatic Effects Monitoring Plan Rev 0.

Please do not hesitate to contact me if there are any problems or concerns.

Respectfully,

A handwritten signature in black ink, appearing to read "O. Curran".

Oliver Curran, Director, Sustainable Development

c.c.:
Stephen Bathory, Justin Buller (QIA)
Mark Dahl (EC)
Karen Costello, Tracey McCaie, Erik Allain, Justin Hack, Scott Burgess (AANDC)
David Hohnstein, Sean Joseph, Stephanie Autut (NWB)
Erik Madsen, Jim Millard (Baffinland)

Attachment A

Updated Aquatic Effects Monitoring Plan Rev 1 (provided separately)

Attachment B:

**Baffinland Responses to Agency comments on Aquatic Effects Monitoring Plan
Rev 0.**

Attachment B – Baffinland Responses to Regulator Comments Received Re: Aquatic Effects Monitoring Plan Rev 0

Baffinland Responses to Agency Comments on AEMP – DFO		
Section	Comments	Baffinland Response
•Section 4.3.3 Initial Stream Diversion Barrier Study; Appendix H	DFO acknowledges that BIMC has proposed an initial stream diversion barrier study that “will focus on obtaining a better understanding for existing flow conditions, and in particular, the frequency and duration of the occurrence of fish barriers and fish stranding that was identified in five (5) mine site streams.” As a part of the study, BIMC states that the five streams of interest will be monitored in spring and fall during initial years of operation, and that all five streams will be “visually assessed to monitor for potential barrier and obstruction to upstream passage”. DFO notes that the explanation of “visually assessed” is unclear. As such, DFO requests clarification on the visual assessment methodology to determine water levels and barriers in the stream diversion barrier study proposed by BIMC. Additionally, will future surveys include only visual surveys or will electro fishing surveys also be considered to confirm fish presence/absence when there is uncertainty regarding fish passage at potential barriers?	<p>Visual assessment methods will be used to determine barriers to fish movement under existing flow conditions, and to evaluate Arctic char presence/absence at areas upstream of any potential barriers, in each of the five tributaries that will potentially be influenced by mine-related flow reductions. Visual assessment will involve an experienced biologist walking the entire length of each tributary. Full barriers to fish migration will be assessed as any step-drops in elevation that are perceived to be sufficient to ascend for upstream-migrating fish, or any areas of discontinuous surface flow that may result in stranding of any downstream/upstream-migrating fish. For each full barrier, a description of the barrier and quantitative measurements of the barrier (e.g., step-drop elevation change, gap distance for areas of discontinuous surface flow) will be taken using a tape measure, and Global Positioning System (GPS) geographic coordinates will be recorded. These observations and coordinates will be taken in addition to the measurements and photographs of the barrier as previously described in Appendix H. A summary of the specific methodology to be used is provided below.</p> <p>Visual assessment of Arctic char presence/absence will be conducted along the entire length of the stream by an experienced biologist. While keeping visually focused on the stream, the biologist will slowly walk in, or immediately next to, wetted areas within each tributary. All observations of fish presence (species and numbers of individuals observed), habitat in which the fish observation occurred (e.g., pool habitat, riffle edge, amongst boulders), and GPS coordinates for locations of fish observations will be recorded by the biologist. The duration of the survey period (in hours and minutes), from commencement to completion, will also be recorded to facilitate comparisons of effort among surveys based on numbers of observations per unit time. Implementation of these methods by an experienced biologist will allow effective determination of whether potential barriers result in the prevention of fish migration within each tributary, and thus electro fishing surveys are not deemed necessary for the assessment. During report preparation, the combination of visual observations of barriers, fish presence and associated flows at the time of the survey can be used to determine the conditions in which fish migration will be limited within each tributary under various flow conditions.</p> <p>Revision made to AEMP Rev 1 Section 4.3.3</p>
•Appendix F Lake Sedimentation Monitoring Program	<p>In section 4.0 ‘Monitoring Area and Sampling sites’, BIMC proposes to monitor sediment deposition at sampling sites that will “include a suspected Arctic Char spawning area”. However, BIMC states that “specific spawning sites have not been identified within Sheardown Lake NW and the FEIS conservatively assumed that areas of hard substrate at water depths ranging from 2-12m in the lakes could potentially provide spawning habitat”. Since the deposition of sediment on Arctic Char eggs can adversely affect egg survival, the monitoring of sediment deposition should target actual spawning locations. Therefore DFO requests clarification on BIMC’s future plans to identify Arctic Char spawning shoals for the sedimentation monitoring program.</p> <p>DFO will continue to work cooperatively with the NWB and BIMC regarding the development of the Interim Closure and Reclamation Plan and the Aquatic Effects Monitoring Plan as they relate to the mandate of the Fisheries Protection Program</p>	<p>During the first two years (2013 and 2014) of the Lake Sedimentation Monitoring Program, sedimentation rates measured in Sheardown Lake NW have been low and relatively consistent across the three (3) established monitoring sites in the lake. These monitoring sites include: i) an area of gravel-rubble substrate located adjacent to a shoal that is deemed suitable for Arctic charr spawning; ii) an area of silt-sand substrate at comparable depth to the shoal area described above to provide information on shallow depositional habitat sedimentation; and, iii) an area of silt substrate at the main lake basin to reflect sedimentation at the ultimate depositional zone within the lake. Through comparisons of the measured sedimentation at Sheardown Lake NW to sedimentation amounts known to adversely affect salmonid egg survival that are available from published literature, the current lake sedimentation monitoring program will provide a strong scientific basis for the determination of any sediment deposition effects on Arctic charr egg survival at Sheardown Lake NW.</p> <p>Hence, the identification of specific Arctic char spawning shoals in Sheardown Lake NW is not critical to understanding/estimating any adverse effects to Arctic charr egg survival in the lake due to sediment deposition. Accordingly, Baffinland does not plan to include a fisheries study to determine specific spawning locations for Arctic char in Sheardown Lake NW as part of the Lake Sedimentation Monitoring study at this time.</p> <p>Revision made to AEMP Rev 1 Section 4.3.1</p>

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
2.1.1 Data evaluation methods for biota populations			
<ul style="list-style-type: none">• Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 0), June 27, 2014, Section 5.4• Appendix A – Draft Environmental Effects Monitoring Program (EEM) Cycle One Study Design, June 2014, Sections 3.4.3, 3.5.2	In Table 5.5 the statistical tests proposed for comparing effect indicators are ANOVA and ANCOVA. These tests assume a normally distributed sample population. In the arctic char measured during the baseline study, fork length and round weight were not normally distributed as illustrated in Figure E.1 and described in Table E.2 of the Draft EEM. The inappropriateness of this test is mentioned in Section 3.5.2 of the Draft EEM: “An ANOVA model will be used Provided the populations are normally distributed, of equal variance and independent of one another.” No alternate models are proposed for use when the populations are not normally distributed and the ANOVA model has already been applied in such cases, for example in Table E.2.	AANDC recommends that: a) the AEMP and EEM only use ANOVA tests to compare fish or biota populations when they are normally distributed and b) the documents propose alternate tests for non-normal distributions.	<p>Differences in fish and other biotic endpoints between mine-exposed and reference areas will be preferentially tested using pair-wise, single factor ANOVA. Prior to ANOVA, all data will be evaluated for normality and homogeneity of variance to ensure that applicable statistical test assumptions will be met. For any non-normal data or normal data with unequal variance, log transformation (for absolute data) or logit transformation (for proportional data) will be conducted and followed by re-evaluation for normality and homogeneity of variance. ANOVA tests will be conducted using the data set (i.e., untransformed or transformed) that meets the test assumptions. Because ANOVA methods are relatively robust under moderate violations of test assumptions, ANOVA may also be applied for non-normal data sets with modest violations. However, in instances in which normality cannot be achieved through data transformation, non-parametric Mann-Whitney U-test statistics will be used to confirm the statistical results from the ANOVA using transformed data. Similarly, in instances in which variances of normal data could not be homogenized by transformation, pair-wise comparisons will be conducted using Student’s t-tests assuming unequal variance to confirm the statistical findings of the ANOVA tests. All statistical treatment of the data, including description of any data transformation and removal of outliers, will be clearly described in the interpretive report.</p> <p>Revision made to AEMP Rev 1 Section 5.2</p>
2.1.2 Fish usability			
<ul style="list-style-type: none">• Appendix A – Draft Environmental Effects Monitoring Program (EEM) Cycle One Study Design, June 2014, Section 3.4.5	A concentration is referred to in order to justify not proposing a fish usability study. The parameter with a concentration below 0.01 µg/L is not specified.	AANDC requests that the AEMP specify the parameter used to justify not proposing a fish usability study.	Effluent quality has been estimated using humidity cell testing results of the ore, local precipitation volumes as well as contact time that precipitation will have with the ore and waste rock stockpiles. The effluent quality is not expected to contain mercury concentrations ≥ 0.01 µg/L, therefore a fish usability study is not proposed in this study design. Should effluent characterization results report concentrations of mercury ≥ 0.01 µg/L, a fish usability study will be undertaken as required by the MMER.

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
2.4 Monitoring of Milne Port Ore Stockpile Runoff Ponds (also included in AANDC Technical Review Submission on November 14, 2014)			
<ul style="list-style-type: none">• Attachment 1, Drawing H349000-2000-00-015-0017 Milne Port Early Revenue Phase Site Layout;• Attachment 1, Drawing H349000-2345-10-035-0001 Milne Port Ore Stockpile Sedimentation Ponds;• Attachment 1, Drawing H349000-2100-10-015-0001 Milne Port – Site Preparation Site Layout Drainage Plan;• Fresh Water Supply, Sewage, and Wastewater Management Plan BAF-PH1-830-P16-0010 (January 31, 2014), Section 5.3 (Treated Wastewater Generation and Discharge/Outfall Locations), Table 5.7 (Effluent Discharge Quality Limits for Ore Stockpiles and Pits), page 18;• Aquatic Effects Monitoring Plan (AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Section 3.4.1 (Surveillance Network Program Overview), Table 3.2 (Established SNP Monitoring Stations Associated	<p>In Baffinland’s response to AANDC’s IR No. 3.2 additional information on the operation of the Milne Port ore stockpile runoff ponds was provided. Baffinland clarified that “The AEMP states that that Runoff from the stockpile area at Milne Port will be collected in a pond that will discharge to the marine waters of Milne Inlet. Environment Canada has advised Baffinland that the mine effluent discharge to Milne Inlet will not be subject to the MMER, though the Fisheries Act still apply, including Section 36(3) regarding the prohibition of discharges of a deleterious substance in waters frequented by fish. Effluent discharge quality limits for ore stockpiles and pits will be in compliance with the Freshwater Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010) Table 5.7.” However, as AANDC identified in IR No. 3.2, no Surveillance Network Program (SNP) monitoring station to characterize ore stockpile runoff quality has been proposed at Milne Port (as is the case for ore stockpiles at the Mine Site and Steensby Port) in either of the recently updated Fresh Water Supply, Sewage, and Wastewater Management Plan or the Aquatic Effects Monitoring Plan. As identified in IR No. 3.2, there is no ore stockpile runoff monitoring station listed in Tables 3.2 and 3.3 of the AEMP (in Section 3.4.1 Surveillance Network Program Overview) which summarize the ERP monitoring locations. If monitoring of the Milne Port ore stockpile runoff is intended to be carried out at the new “MP-01 Future” water quality monitoring station identified on the site plan figure (Drawing H349000-2100-10- 015-0001, Application Attachment 1, Part 5), Baffinland needs to clarify how compliance with the ore stockpile runoff discharge limits will be established independent of compliance with Wastewater Treatment Plant (WWTP) discharge limits at this same location.</p> <p>Rationale: Baffinland has identified the discharge limits which will apply to the Milne Port ore stockpile</p>	<p>AANDC requests that the amended Type A Water Licence clearly identify where compliance with the proposed discharge limits for the Milne Port ore stockpile runoff will be established (i.e., where a monitoring station will be established for the Surveillance Network Program to isolate treated ore stockpile runoff quality). This new monitoring station should also be included in updated versions of the Fresh Water Supply, Sewage, and Wastewater Management Plan and the Aquatic Effects Monitoring Plan.</p>	<p>Under the amended Type A water Licence, monitoring location and designated analytes and schedules have been established. MS-08 has been established to monitor runoff from the Waste Rock Pile at the Mine Site while MS-06 has been established to monitor the Ore Stockpile Pond. In Milne Port MP-05 and MP-06 have been established to monitor the East and West Ore Stockpile Settling Ponds. The monitoring stations are denoted on Figures 3.2 and 3.3 in Section 3.5 of the AEMP. MS-06 will be discharged through a wastewater sewage pipeline when necessary. Compliance with the ore stockpile runoff discharge limits will be established independent of compliance with Wastewater Treatment Plant (WWTP) discharge limits by sampling each facility at source for the scheduled analyses per the Amended Type A Water Licence.</p> <p>Revision made to Section 3.5</p>

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
with ERP) and Table 3.3 (Future SNP Stations Associated with ERP), pages 26 and 30.	runoff. It is not clear at what monitoring location compliance with these limits will be established. If monitoring of the ore stockpile runoff is proposed in the new outfall ditch (new MP-01) prior to its discharge to the marine environment, Baffinland needs to address how one monitoring location will be used to measure compliance with two different sets of discharge limits, one for ore stockpile runoff, the other for WWTP releases.		
2.5 Distinct monitoring stations for pit lake and waste rock stockpiles			
Aquatic Effects Monitoring Plan (AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Figure 3.2; Nunavut Water Board Water Licence No: 2AM-MRY1325, Schedule I, Table 14; AANDC Technical Review Comment No. 18, Technical Review - Baffinland Mary River Iron Ore Project Type A Water Licence Application (June 22, 2012); Baffinland Response to Technical Review Comments on the Type A Water Licence Application (October 12, 2012); AANDC Issue 9.3, Final Submission – Regarding Baffinland Iron Mines Corporation Type A Water Licence Application for the Mary River Project (March 21, 2013);	The AEMP proposes monitoring of the East Pond which will receive both waste rock pile runoff and effluent from pit dewatering. AANDC requested that a separate monitoring station for the pit be included in the plan to facilitate a better understanding of the acid generating potential of the future pit walls. Baffinland committed that a separate monitoring station would be applicable to future revisions of the Closure and Reclamation Plan as the open pit begins to develop (>10 year timeframe) and that in the meanwhile seepage water in the active mining area would be regularly monitored and the information used to inform acid generating and metal leaching estimates. AANDC requested that this commitment be captured as a water licence requirement and Baffinland responded that an exact location for the monitoring of pit water quality cannot be identified until there is a mine pit and mine pit water discharge. To date, there appears to be no distinct monitoring station for pit water quality in the existing water licence or in the new AEMP. Rationale: Establishing separate pit water and waste rock pile runoff monitoring stations would provide useful information to develop acid generating and metal leaching estimates required for updated pit lake water quality modeling. While it would not be possible to sample pit waters until the open pit forms some	AANDC recommends that the commitment to maintain separate water quality monitoring stations for the pit and the waste rock stockpile be captured in the AEMP.	The Amended Type A Water Licence contains requirements for monitoring of the Waste Rock Pile (MS-08). Monitoring downstream of the waste rock pile in a settling pond commenced during the summer of 2015 which coincided with the early development of the waste rock pile. The results of the waste rock settling pond Water Licence sampling station will be provided in the QIA/Water Licence Annual Report, monthly Water Licence reports, and in MMER quarterly and annual reports. An assessment will be provided in annual reports regarding AEMP and MMER monitoring which will provide water quality results in the downstream receiving environment (Mary River). Currently, the pit has not been developed sufficiently to the point where there is a sump with active discharge. Once this has occurred, Baffinland will work with the AANDC Water Resource Officer to select a suitable location(s) and analytical schedule for monitoring. Revision made to AEMP Rev 1 Section 2.1.1

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
Baffinland Response to Final Intervention Comments (April 5, 2013).	10 years into the future, the commitment to establish this future monitoring station should be captured in the AEMP		
<ul style="list-style-type: none"> • Aquatic Effects Monitoring Program Framework (December 2013), Section 4.2, page 15 Nunavut Land Claims Agreement, Article 20, Part 2; • Final Environmental Impact Statement (February 2012) Volume 7 Section 1.0 –Regional Fresh Water Setting, page 11; • Addendum to the Final Environmental Impact Statement Early Revenue Phase (June 2013) Volumes Two through Seven, Appendix 7A • AANDC Completeness Review Regarding the Amendment to the Type A water license 2AM-MRY1325 (September 19, 2014), Comment No. 3.5; • Baffinland Responses to Agency Comments on the Amendment to the Type ‘A’ Water Licence 2AM-MRY1325 (October 3, 2014); • Aquatic Effects Monitoring Plan 	<p>Under Section 4.2 of the Aquatic Effects Monitoring Program Framework Baffinland committed to maintaining a hydrometric network as the project moves forward. The four year-round hydrometric stations operated by Water Survey Canada were discontinued in 2011, leaving a network of only 6 seasonal stream gauges to be operated in 2014 and onward. Baffinland indicated in their October 3, 2014 response to our completeness review that 9 additional seasonal hydrometric stations were installed at the Mine Site and at Milne Port to measure discharge from project areas. It is not clear how the hydrometric network has been expanded to include the Milne Port area and details of the hydrometric network, including the additional stations installed in 2014 remain outstanding.</p> <p>In March 2014, AANDC recommended that Baffinland submit their hydrometric data to Water Survey Canada (WSC) as “contributed data” so that it can be validated and published if it meets appropriate standards. AANDC requested this information again in the completeness review for the amendment application but Baffinland responded that this request was outside of the scope of the Type A water licence amendment application. It is important that hydrometric data meets national standards and that it is made available to the public to ensure that there is no impact to water quality, quantity, and flow. It is also incumbent on individual mining projects, including Baffinland, to make a contribution to regional monitoring in development of a long-term hydrometric record that will support future decision-making. Under Section 1.0 of the FEIS (2012), Baffinland stated that the hydrological</p>	<p>AANDC requests Baffinland to</p> <p>a) provide additional information on the hydrometric network located within the Mary River Project area;</p> <p>b) provide details on the additional hydrometric stations installed in 2014;</p> <p>c) commit that hydrometric data will meet national standards;</p> <p>d) commit that hydrometric data will be shared with AANDC and the NWB.</p> <p>AANDC further requests that Baffinland</p> <p>e) clarify whether snow surveys are conducted</p> <p>f) provide results of annual snow surveys and annual water balances in annual reports; and</p> <p>g) reference annual water balance calculations based on monitoring data when completing the design of civil works.</p>	<p>a) The hydrometric network at the Mary River Project Area consists of six (6) AEMP stations and nine (9) SNP Water Licence stations. The AEMP stations are location in and around the Project area and are summarized in Figure 3.1, in section 3.3 of the AEMP document.</p> <p>b) The additional stations installed in 2014 were at the nine (9) Water Licence monitoring stations installed in response to a monitoring requirement of the Amended Type A Water Licence. The hydrometric monitoring stations were installed to measure surface water discharge at or near each of the SNP stations. The measurement techniques used were based on the characteristics of each site. At all of the hydrometric stations, pressure transducers with data loggers were installed. Rating curves were developed to produce a long-term flow record from the water level data. Water level data were recorded at each site on 15 minute intervals and daily discharge values were calculated by averaging the 15 minute data on a daily basis. These locations are identified in Figures 3.2 and 3.3 in Section 3.5 of the AEMP.</p> <p>c) The AEMP and Water Licence stations have been installed and are operated in consideration of the national standards set out by the Water Survey of Canada (WSC). The WSC does not provide a stand-alone document on national standards; however, the standards for hydrometric data collection are outlined in several publications, including the WSC Hydrometric Technician Career Development Program Manuals. The WSC outlines specific standards for procedures, documentation, and analysis to be used in the collection of hydrometric data. In some cases, it can be a challenge to meet the “ideal” conditions outlined in the WSC standards. For example, on smaller streams, which typically have bouldery channels and turbulent flow conditions, there is inherently a greater uncertainty in flow measurements. Baffinland is committed to maintaining and operating all the hydrometric stations to the WSC standards whenever possible.</p> <p>d) Baffinland is willing to circulate the results of hydrometric monitoring (data and/or reports) with the various government stakeholders who express interest in receiving it.</p> <p>e) Routine snow surveys are not currently conducted for the Mary River Project. Seasonal snow accumulation patterns are controlled at the regional scale by differences in precipitation and are influenced considerably at the local scale by wind redistribution. The late winter snow surface is highly variable due to the complex interaction of blowing snow with land surface roughness and topography. Areas exposed to wind are typically scoured of snow and a large proportion of the snow accumulates as snow drifts on lee slopes and in valleys and/or depressions. The extent and volume of snow water equivalent contained in large snow drifts is difficult to quantify and generalizing snow distribution within high arctic tundra catchments is not a simple task.</p> <p>f) The project has no large-scale water management facilities that require annual water balances, hence, there is no requirement in the Amended Type A Water Licence to submit annual water balances. The runoff collection ponds are designed to collect site runoff and act as settling ponds to reduce any suspended sediment. The runoff collection ponds have been designed to accommodate a range of precipitation and snowmelt conditions and the available pumping capacity is adequate to manage even the most extreme melt conditions.</p> <p>g) The basis for the design of civil works have utilized rainfall data that has been collected at the Mary River weather station since 2005.</p> <p>Revision made to AEMP Rev 1 Section3.3 and 3.5</p>

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
(AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Section 3.3	<p>monitoring program will be continued to improve the long-term hydrological record. This information is important for the engineering design of infrastructure that conveys or retains surface waters such as diversion channels, stockpile runoff sediment ponds, spillways, river bridge crossings, culverts and ditches. The Addendum to the Final Environmental Impact Statement (2013) does not provide further details on the long-term monitoring program.</p> <p>Rationale: There is insufficient information provided on the hydrometric network to assess its value in supporting long-term regional monitoring or in addressing potential project-specific impacts to fresh water quality, quantity, or flow.</p>		
2.7 The Early Revenue Phase (ERP) Monitoring Program			
<ul style="list-style-type: none">• Aquatic Effects Monitoring Plan (AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Section 3.4;• Nunavut Water Board Water Licence No. 2AM-MRY1325;• Nunavut Water Board Water Licence No. 8BC-MRY1416	<p>The AEMP was submitted as a requirement under Part I, Item 2 which requires the Licensee to submit an AEMP at least 60 days prior to commencing the operation phase. Baffinland’s Type B water licence 8BC-MRY1416 (Type B licence) requires the Licensee to submit a Monitoring Plan by October 5, 2014 (Part J, Item 1) and maintain monitoring stations at the Milne Port ore dock, ore stockpile areas, ship-loading facilities, sedimentation ponds, and ore reclaiming and conveying facilities, proposed polishing waste stabilization ponds and Matrix Camp expansion (Part J, Item 2). Baffinland requested an extension until March 2015 to submit the required Monitoring Plan and while the AEMP does include some future monitoring stations for ERP (Table 3.3), it does not appear to include all monitoring stations required under the Type B licence (Part J, Item 2 of 8BC-MRY1416).</p> <p>Rationale: As it is Baffinland’s intent to consolidate all requirements for the construction and operation of the Mary River Project under the Type A licence, the monitoring program</p>	<p>AANDC requests clarification whether the AEMP will include all monitoring requirements for the Type A and Type B licence in order to consolidate all monitoring requirements for the Mary River Project (mining as well as ERP construction).</p>	<p>The Amended Type A Water Licence regulates an extensive scope of project activities and regulated standards, some of which that do not pertain to the outlined scope of the AEMP. Monitoring prescribed under the related and water licence prescribed Surveillance Network Program (SNP) focuses on detecting water quality exceedances relative to specified water licence criteria. The AEMP is designed to detect project related impacts at greater temporal and spatial scales that are ecologically relevant (i.e., on a basin spatial scale). Where project related effects are detected in the downstream aquatic receiving environment monitored by the AEMP, the results from water quality and hydrometric stations as established under the water licence will be reviewed and potential linkages identified and included in the AEMP annual report. Please note that the terms and conditions related to monitoring requirements in the Type B construction licence have been replaced by those in the Amended Type A Water Licence.</p>

Baffinland Responses to Agency Comments on AEMP - AANDC			
Section	Comments	Recommendation	Baffinland Response
	required under the Type B licence, authorizing ERP construction, should also be considered in the AEMP.		
2.8 The Rail Phase of the Mary River Project			
• Aquatic Effects Monitoring Plan (AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Sections 4.2.2, 4.2.4, 4.2.5, 4.2.6, 4.3.3, and 7	Baffinland has contemplated a 5-year operating plan for the ERP, after which time the full-scale railway project would also be brought on-line. A number of sections in the AEMP indicate that annual sampling will be conducted for the first 3 years of operation during the ERP. While it does not specify that annual sampling will also be conducted during the first 3 years of the full-scale operation of the approved project (rail phase + ERP), it does indicate that sampling frequency will be evaluated annually to determine if modifications are warranted. Baffinland states that monitoring for the approved project will start one year prior to the start of larger scale mining. Rationale: It is understood that the AEMP is a living document and will be periodically updated as required (potentially every 3 years) and filed with the Annual Report, but there is no specific commitment to update the AEMP prior to commencing full-scale operations (mining at a rate of 21.5 Mt/a).	AANDC recommends that the AEMP is updated 60 days prior to commencing larger scale operation of the approved project.	Noted.

Baffinland Responses to Agency Comments on AEMP- QIA		
Section	Comments	Baffinland Response
•General	The QIA notes that the June 27, 2014 AEMP was submitted to the NWB in accordance with Part I, Item 2 of the Type ‘A’ Water Licence 2AM-MRY1325. It is the QIA’s understanding that the scope of the Type ‘A’ Water Licence does not include the Early Revenue Phase (ERP) activities; BIMC has sought an amendment to their Water Licence ³ to address the ERP and the NWB is currently completing a review of that amendment application. Therefore, the QIA’s review of the AEMP is restricted to the current Water Licence scope and does not include a review of the ERP activities. Should the ERP activities be approved and the Water Licence amendment occurs, the QIA recommends that the AEMP be updated, reviewed and approved as a requirement of the amended Water Licence. The QIA therefore reserves the right to complete a review of the ERP components of the AEMP at a time when the activities are further understood, and not as part of the Water Licence amendment review process. The QIA’s review of the Type ‘A’ Water Licence amendment (developed under a separate cover for submittal to the NWB) addresses preliminary comments regarding the ERP related components of the AEMP.	No comment from Baffinland is required.
•General	The AEMP is limited in the aquatic effects monitoring along the Tote Road and quarry/borrow sites. Each of these locations have construction, operations and/or closure activities that have potential to impact the receiving environment. Watercourse crossings (i.e., culvert and bridge construction and operation) have the potential to impact fishery resources, and alter water quality and flow from natural conditions. Short- and long-term effects for watercourse crossings and quarry/borrow sites can arise as a result of the release of sediments due to construction activities and erosion processes. Specific to the Tote Road water crossings and quarry/borrow sites, the AEMP should include the following additional items:	<p>Upgrades to the existing Tote Road were approved under the railway project. The current monitoring programs in place under DFO authorizations and the Water Licence are sufficient to assess downstream water quality.</p> <p>Monitoring of crossings both during and post construction are included in the proposal documents submitted to DFO are a requirement of existing DFO authorizations. The July 2014 Environmental Protection Plan for the project contains several Operational Environmental Standards (OESs) that are relevant to the management and monitoring of construction activities along the Tote Road. These include OES 2.17 Road Construction and Borrow Development, and OES 2.18 Tote Road Watercourse Crossing Installation. In addition the Surface Water and Aquatic Ecosystem Management Plan (July 2014) also includes control and monitoring methodologies to be adopted for construction activities along the Tote Road. Under the Water Licence, there is the requirement for quarry and borrow source management plans. These plans provide drainage drawings and monitoring locations/schedules downstream of each of those operations.</p> <p>In addition the DFO reviewed the updated August 2013 design for the stream crossings on the Tote Road and determined that the proposed work would not likely result in impacts to fish and fish habitat provided that our proposal is implemented as planned. Refer to DFO Letters of Advice dated December 16 and December 20, 2013.</p> <p>An annual inspection of all fish bearing stream crossings is undertaken each year under the direction of a fish biologist. The results of annual monitoring are provided in an annual report provided to the DFO. This report is also provided to regulators as an attachment to the NIRB Annual Report.</p>
	a. Detail how the monitoring during operations will be used to assess potential changes to aquatic environment, water quality and water quantity.	<p>As stated above, DFO determined that the proposed work would not likely result in impacts to fish and fish habitat provided that our proposal is implemented as planned. A fisheries biologist conducts a survey of the performance of the stream crossings on an annual basis and the results of this survey are provided in an annual report provided to the DFO and other regulators/agencies including the QIA. Monitoring downstream of quarries and borrow source operations is currently a requirement of the Water Licence as well as quarry and borrow source management plans that are submitted under the Water Licence. The Water Licence provides water quality criteria for locations downstream of construction and quarries/borrow sources.</p> <p>Revision made to AEMP Rev 1 Section 3.6.1</p>

Baffinland Responses to Agency Comments on AEMP- QIA		
Section	Comments	Baffinland Response
	b. Detail how monitoring during construction (where applicable) will be used to assess potential changes to the aquatic environment, water quality and water quantity.	DFO required monitoring includes pre and post construction monitoring which will be used to assess for potential effects. These results will be provided in the DFO Tote Road Annual Report and to interested parties including the QIA. The Water Licence requires monitoring downstream of construction areas including quarry and borrow sources.
	c. The locations of monitoring, along with the parameters to be monitored and the frequency of monitoring.	DFO required water quality monitoring in the open water season consists of upstream and downstream monitoring for turbidity of crossings before and after construction work. These locations will vary from year to year and will be dependent on where construction activities on the road have occurred. Monitoring of other crossings is based on annual inspections of crossings to assess stability of the crossings. The tote road monitoring results are provided in the DFO Tote Road Annual Report. For monitoring downstream of quarry and borrow source operations, monitoring locations/frequencies and schedule of analyses are provided in the Water Licence and in the quarry and borrow source management plans.
	d. Details of how the monitored data will be analyzed to make a determination on the aquatic effects.	The monitoring results downstream of quarry and borrow sources will be compared to applicable water licence criteria. Monitoring of stream crossings recently constructed must meet criteria provided in the Fisheries Authorizations.
	e. Development of benchmarks for applicable indicator parameters.	See above.
	f. Management actions and responses relative to the developed benchmarks	A wide range of potential management actions are outlined in the Surface Water and Aquatic Ecosystem Management Plan. The potential actions would be situation and site specific based on the particular circumstances of the concern. In the event of a non-compliance at a given location, Baffinland would reach out to the responsible agency/Inspectors to ensure they are informed and have input into Baffinland's management action(s) and follow-up monitoring.

Baffinland Responses to Agency Comments on AEMP - Environment Canada		
Section	Comments	Baffinland Response
•General	On a more general note Environment Canada has a good working relationship with Baffinland through the terrestrial and marine environment working groups. In the working groups Baffinland has proven to be receptive to Environment Canada advice and has incorporated or assisted with much of the migratory bird monitoring needs identified by Environment Canada.	Noted
•General	With regard to the questions posed in NIRB's comment request letter of May 26, 2015 regarding: 1) Effects monitoring a. Whether the conclusions reached by Baffinland in the Mary River Project 2014 Annual Monitoring Report are valid; Based on the information available Environment Canada accepts the conclusions drawn; however, Environment Canada is of the opinion that the recommendations provided in this letter will make the conclusions drawn from monitoring more robust. Environment Canada acknowledges that the marine monitoring program in Milne Inlet is being developed on an ongoing basis and looks forward to participating in the refining of the program through the Marine Environment Working Group.	Noted
•General	2) Compliance Monitoring i. How terms and conditions are incorporated into agency authorizations Not applicable as Environment Canada has not issued any authorizations for this project.	Comment directed at the NIRB

Baffinland Responses to Agency Comments on AEMP - Environment Canada		
Section	Comments	Baffinland Response
•General	<p>2) Compliance Monitoring</p> <p>ii. A summary of any inspections conducted during the 2014 reporting period, and the results of these inspections;</p> <p>Environment Canada Environmental Enforcement Officers completed an inspection of the Baffinland project October 7 - 9, 2014 for the purposes of verifying compliance with CEPA99 and associated regulations that apply to the site. Applicable regulations included the Environmental Emergencies Regulations, Interprovincial Movement of Hazardous Waste Regulations and National Pollution Reporting Inventory. CEPA99, Part 9 regulations such as the Petroleum and Allied Petroleum Products Storage Tanks Regulations and the Federal Halocarbon Regulations 2003 do not apply on Inuit owned lands and therefore, inspection under these regulations was limited to federal lands. The site including the Milne port area was also inspected to verify compliance with the Fisheries Act for facilities located near fish bearing waters. Discussions were also held with Baffinland regarding when the Metal Mining Effluent Regulations would apply to the site and the requirements under the regulation once it was triggered. It is anticipated that the MMER will be triggered in June/July 2015. Only minor non-compliance issues were identified during the inspection. Environment Canada is satisfied that the identified non-compliance issues were resolved by Baffinland in a timely fashion.</p>	Comment directed at the NIRB
•General	<p>iii. A summary of AEM's compliance status with regard to authorizations that have been issued for the Project. Not applicable as Environment Canada has not issued any authorizations for this project.</p>	Comment directed at the NIRB