Water Resources
Nunavut Regional Office
P.O. Box 100
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Your file - Votre référence
2AM-MRY1325
Our file - Notre référence
CIDM# 868969

November 21, 2014

Phyllis Beaulieu
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0A 1J0

Re: 2AM-MRY1325 – Mary River Project – Baffinland Iron Mines Corporation – Aquatic Effects Monitoring Plan

Dear Phyllis Beaulieu:

Thank you for your 14 October 2014 invitation for written representations on the above referenced Aquatic Effects Monitoring Plan (AEMP).

Aboriginal Affairs and Northern Development Canada (AANDC) has conducted a technical review of the AEMP and results of our review are identified in the attached memorandum for the Nunavut Water Board's consideration.

Comments have been provided pursuant to AANDC's mandated responsibilities for the enforcement of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

AANDC appreciates the opportunity to participate in this review. If there are any questions or concerns, please contact me at (867) 975-4738 or by e-mail at Jean.Allen@aandc-aadnc.gc.ca.

Sincerely,

Jean Allen
Water Management Specialist

Enclosure

cc. Karen Costello, Director, Resource Management, AANDC
James Neary, Project Manager, Mary River Team, AANDC
Erik Allain, Manager, Field Operations, AANDC

Technical Review Memorandum

Date: November 21, 2014

To: Phyllis Beaulieu – Manager of Licensing, Nunavut Water Board

From: Jean Allen – Water Management Specialist, AANDC

Subject: Review of Baffinland Iron Mine Corporation's Aquatic Effects Monitoring Plan for the Type A Water Licence 2AM-MRY1325

1.0 Background

Baffinland Iron Mines Corporation (Baffinland) submitted to the Nunavut Water Board (the Board or NWB), a Draft Aquatic Effects Monitoring Program (AEMP) Framework for the Construction Phase of the Mary River Project in February 2013 and in November 2013, submitted an updated AEMP Framework based on consultations with interested parties.

Baffinland submitted an Aquatic Affects Monitoring Plan (AEMP) as required under Part I, Item 2 of the Type A water licence 2AM-MRY1325 (Type A licence) prior to commencing the Operations Phase. The NWB requested interested parties to review and make representations by November 14, 2014.

The AEMP is a monitoring program designed to:

- Detect short-term and long-term effects of the Project's activities on the aquatic environment resulting from the Project
- Evaluate the accuracy of impact predictions
- Assess the effectiveness of planned mitigation measures
- Identify additional mitigation measures to avert or reduce environmental effects

2.0 Results of Review

2.1 Monitoring of Milne Port Ore Stockpile Runoff Ponds (also included in AANDC Technical Review Submission on November 14, 2014)

Reference:
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 with ERP) and Table 3.3 (Future SNP Stations Associated with ERP), pages 26 and 30.

Issue:
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.

Rationale:
Baffinland has identified the discharge limits which will apply to the Milne Port ore stockpile 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.

Recommendation:
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.

2.2 Distinct monitoring stations for pit lake and waste rock stockpiles

Reference:
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);
Baffinland Response to Final Intervention Comments (April 5, 2013).

Issue:
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 10 years into the future, the commitment to establish this future monitoring station should be captured in the AEMP.

Recommendation:
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.

2.3 Hydrological Monitoring

Reference:
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 licence 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 (AEMP) BAF-PH1-830-P16-0039 (June 27, 2014), Section 3.3

Issue:
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.

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 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.

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.

Recommendation:
AANDC requests Baffinland to a) provide additional information on the hydrometric network located within the Mary River Project area; b) provide details on the additional hydrometric stations installed in 2014; c) commit that hydrometric data will meet national standards; d) commit that hydrometric data will be shared with AANDC and the NWB.

AANDC further requests that Baffinland e) clarify whether snow surveys are conducted f) provide results of annual snow surveys and annual water balances in annual reports; and g) reference annual water balance calculations based on monitoring data when completing the design of civil works.

2.4 The Early Revenue Phase (ERP) Monitoring Program

Reference:
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

Issue:
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).

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 required under the Type B licence, authorizing ERP construction, should also be considered in the AEMP.

Recommendation:
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).

2.5 The Rail Phase of the Mary River Project

Reference:
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

Issue:
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).

Recommendation:
AANDC recommends that the AEMP is updated 60 days prior to commencing larger scale operation of the approved project.