



Environment and
Climate Change Canada

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Environmental Protection Operations Directorate
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ECCC File: 6100 000 011/ 001
NIRB File: 08MN053

Solomon Amuno
Technical Advisor
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU X0B 0C0

Via email: info@nirb.ca

RE: 08MN053 – Baffinland Iron Mines Corp. – Mary River Project – 2016 Annual Report

Attention: Solomon Amuno

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Impact Review Board regarding the above-mentioned annual report. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act* (SARA).

The following comments are provided:

Effects Monitoring

ECCC finds the Annual Report format user-friendly and well laid out. The attached comment table titled *ECCC Comments on Baffinland's Mary River Project 2016 Annual Monitoring Report* lists comments and recommendations for consideration.

Compliance Monitoring

During 2016 no authorizations from ECCC were issued. Three on-site inspections were completed by ECCC Environmental Enforcement in 2016:

- An on-site inspection of the Baffinland Iron Mines Corp. (Baffinland), Mary River Project (the Project) was completed by ECCC Environmental Enforcement on

January 5th and 7th, 2016 to verify compliance under the *Canadian Environmental Protection Act* (CEPA) and the *Fisheries Act* (FA). No compliance issues were identified during the course of the on-site inspection.

- An on-site inspection of the Project was completed by ECCC Environmental Enforcement on May 18, 19 and 20, 2016 to verify compliance under CEPA and the FA and in response to spill reports 2016-158 and 2016-175. During the on-site inspection the Enforcement Officer observed rusty coloured water entering into several lakes in the area as well as Mary River and Phillips Creek. These water bodies were confirmed to be water frequented by fish. The officer therefore concluded that the sediment runoff was caused by activities at the mine and was not permitted to be deposited into water frequented by fish. During this on-site inspection chemistry and bioassay sampling was also conducted and a verbal Fisheries Act Direction was issued and later followed up with a written Fisheries Act Direction on May 31, 2016.

The written Fisheries Act Direction directed Baffinland to undertake the following: take measures to stop the discharge, provide updates to the inspector, provide a dust mitigation action plan, provide a Tote Road and Mine Haul Road mitigation action plan to address sediment runoff, complete the construction of the Milne Port stockpile east sedimentation pond, finish constructing the drainage ditching to the Mary River mine site iron ore stockpile crusher sediment pond and provide a follow-up report with an overview of how all the measures to be taken were completed.

- An onsite inspection of the Baffinland, Mary River Project was completed by ECCC Environmental Enforcement on October 5 and 7, 2016, to verify compliance under CEPA and the FA and to follow-up on the Fisheries Act Direction. ECCC has determined that Baffinland completed the actions as indicated in the six Bi-Weekly reports to address the Fisheries Act Direction measures to be taken.

ECCC has determined that Baffinland has complied with the Fisheries Act Direction and no further enforcement action is necessary.

The issue of sedimentation will continue to be monitored and will form part of future inspections at the mine site.

ECCC conducted 5 off-site inspections, and reviewed the 2016 1st, 2nd, 3rd and 4th quarterly reports and 1 annual report for two Metal Mining Effluent Regulations Final Discharge Points, identified as MMER FDP # 1 MS-08 (Waste Rock Sedimentation Pond) and MMER FDP # 2 MS-06 (Crusher/Stockpile Pad Sedimentation Pond). No compliance issues identified.

Should you require further information, please do not hesitate to contact me at (867) 669-4744 or loretta.ransom@canada.ca.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Ransom', with a large, stylized initial 'L'.

Loretta Ransom
Senior Environmental Assessment Coordinator

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)
ECCC Review Team
Karen Kharatyan, Acting Licensing Manager, Nunavut Water Board

Attachment: ECCC Comment Table: *ECCC Comments on Baffinland's Mary River Project 2016 Annual Monitoring Report*

ECCC Comments on Baffinland's Mary River Project 2016 Annual Monitoring Report

Comment #	Reference	Comment	Recommendation
ECCC#1	NIRB Annual Report	The NIRB Annual Report format is user-friendly and well laid out.	
ECCC#2	NIRB Annual Report Section 1.5 page 13 and throughout.	The web portal address is incorrect.	Correct the address to: http://www.baffinland.com/sustainable-development/shareddocuments/?cat=4&subcat=21&archive=1&lang=en
ECCC#3	Section 4.5.10 Marine Environment PC Condition 76 Marine Environmental Effects Monitoring Program (MEEMP)	Section 4.5.10 of the report deals with the Marine Environment conditions. A brief summary of the monitoring is provided in this section and in Table 4.18. The focus is on ship ballast water, prop wash effects, and ore dust deposition. The MEEMP is also designed to detect effects associated with seepage and surface runoff from the Milne Port facility, in fulfillment of Project Certificate Condition 76. The report states that results will continue to be presented to the Marine Environment Working Group on an annual basis; results are not included with the NIRB submission. The MEEMP should also be listed in Table 6.1 with other plans required by a PC condition. Having the full results would facilitate addressing the questions posed by NIRB.	ECCC recommends that the final report with results of the marine monitoring be presented in conjunction with the NIRB Annual Report, similarly to submission of the Aquatic Effects Monitoring Plan (AEMP). This would be in addition to the process proposed in Section 5.1 which indicates that the Baffinland document portal will be used.
ECCC#4	Appendix F2 Aquatic Effects Monitoring Plan (AEMP) (V.1)	Baffinland has provided Version 1 dated Oct. 2015 to the NIRB, and this is the version included with the 2016 Annual Report materials. The current version is the Version 2 AEMP (located on the Baffinland portal).	ECCC recommends Baffinland provide the current version of the AEMP with the Annual Report on the NIRB registry. The appendices for the AEMP were not split up between pdf files in an accessible fashion; this could be improved.

ECCC#5	AEMP Version 2	ECCC acknowledges that the comments previously provided have substantially been addressed in Version 2 of the AEMP. An outstanding issue is the quality of the maps and figures in the body of the report; resolution is so low that text is illegible in many cases.	ECCC recommends that the next update of the AEMP include maps and figures which are of a sufficiently high resolution so that all details are legible.
ECCC#6	AEMP Version 2 Appendix D Development of Final Sediment Quality Benchmarks Dated March 2015	The report by Intrinsik still has a text/formatting problem which has much of the text in the report represented by empty box graphics. This renders the report useless, as headers and information are not available.	ECCC recommends Baffinland provide a copy with the text format problem rectified.
ECCC#7	AEMP Version 2 Appendix G Lake Sedimentation Monitoring Program	The report by North/South Consultants also has a text/formatting problem which has text on the first two pages represented by empty box graphics.	ECCC recommends Baffinland provide a copy with the text format problem rectified.
ECCC#8	2016 QIA-NWB Annual Report for Operations	ECCC has reviewed the main body of the report and found it informative and well laid out.	
ECCC#9	Lake Sedimentation Monitoring Program Appendix D.9.2	The 2016 results identified significantly increased inputs of sediments in Sheardown Lake when compared to baseline. This is attributed to fugitive dust as well as autochthonous matter, potentially in conjunction with sediment inputs from upstream point sources. The increases were primarily observed during the ice-covered period, but extended to two of the three stations in the open water period.	ECCC recommends that the Sheardown Lake sedimentation monitoring study continue on an ongoing basis. ECCC recommends that management and mitigation of dust at the mine site and Milne Inlet facility be a priority for Baffinland.

		<p>The deposition depth of sediments ranged from 1.26 mm/year to 2.02 mm/year, which is higher than for previous studies, and within the range associated with adverse effects on fish egg survival. ECCC acknowledges that effects were not observed in the monitoring of Arctic char; however, sediment deposition rates appear to be trending upwards and continuing increases would raise concerns.</p> <p>The 2016 Core Receiving Environment Monitoring Program (CREMP) report notes the presence of a "...reddish- to orange-brown oxidized material was commonly observed on the surface of Sheardown Lake NW littoral and profundal sediments... a thin, distinct layer that was likely composed principally of iron (oxy)hydroxide precipitate." Iron concentrations in sediments were elevated at the station nearest the Sheardown Lake Tributary 1 watercourse, suggesting erosion as a source. Sediment iron concentrations were above sediment quality guidelines (noting that the reference lake is also elevated) with a marked increase since baseline in iron concentrations for littoral sampling sites. Dustfall monitoring has identified substantial increases in dustfall throughout the project area.</p>	
ECCC#10	Appendix H Dustfall Monitoring Program	<p>It appears that a substantial portion of this report is missing, and there are no page numbers to confirm. The report goes from the following statement:</p> <p>"Annual dust fall results are analyzed against the</p>	ECCC recommends Baffinland provide the missing sections of the Dustfall Monitoring Program report.

		<p>predicted dust deposition thresholds for the Project to determine if dust fall exceeds the applicable indicator threshold. Results are also reviewed to investigate dust fall on a temporal and spatial scale relative to background with focus on seasonal differences in dust fall data.”</p> <p>to the references without providing discussion of the analysis described above.</p>	
ECCC#11	<p>Mary River Project 2016 Core Receiving Environment Monitoring Program (CREMP) Report March 2017 Appendix D.9.1</p>	<p>ECCC was not able to thoroughly review the CREMP at this time, and may provide comments in future should time permit.</p>	
ECCC#12	<p>4.5.5 Groundwater & Surface Water (PC Conditions 20 through 30) Table 4.11 Groundwater and Surface Water Impact Evaluation (page 80)</p>	<p>In table 4.11 proponent states that “<i>Groundwater is not monitored; surface seepage is monitored in accordance with the Water Licence</i>”</p> <p>ECCC is of the view that groundwater should be monitored around waste rock piles etc. to determine whether metal leaching is occurring from the mine waste pile into the groundwater, which can then drain away, especially during the freeze thaw cycle.</p> <p>Justification for not monitoring groundwater should be provided.</p>	<p>ECCC recommends that Baffinland monitor groundwater drainage around the mine waste piles or clarify/justify why groundwater is not being monitored as stated in table 4.11.</p>
ECCC#13	<p>4.5.2 Air quality;</p>	<p>ECCC notes that Baffinland did not undertake any</p>	<p>ECCC recommends that Baffinland provide an explanation</p>

	Project Certificate No.7 and No. 8.	ambient air quality monitoring in 2016. The lack of monitoring is out of compliance with Project Certificate No.7 and No. 8.	as to why air quality monitoring was not conducted for all of 2016, and to resume monitoring activities as soon as possible.
ECCC#14	4.5.2 Air quality; Project Certificate no. 12	ECCC notes that no incinerator stack testing has been conducted since the initial testing in 2013. This means that problems with incineration may go undetected, resulting in the potential release of contaminants such as dioxins, furans, and mercury at levels above Canada-Wide standards. Currently, no commitments to follow-up incinerator stack testing have been made in the Project's Waste Management Plan.	ECCC recommends that stack testing of incinerators be conducted at regular intervals (every 3 years).
ECCC#15	Table 4.16 of the Annual Report	<p>Table 4.16 of the Annual Report is inconsistent with the 2016 Annual Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) report. Section 6 of the annual TEMMP report states that that 9 duck mortalities occurred in 2016 at the mine site. Of the nine individuals, a group of 8 ducks flew into a building as a single significant event.</p> <p>Although Baffinland reported this incident directly to ECCC, it would be valuable to add the details of the incident in the annual TEMMP report for all interested parties and also append all incident reports to regulatory authorities. Photographic evidence should also be collected of incidents, when possible.</p>	ECCC notes improvements in mortality reporting efforts by Baffinland. However, ECCC recommends that the effectiveness of mortality monitoring could be further improved by developing standard protocols and datasheets to assist site staff. This will provide staff with guidance on steps to take (i.e. reporting to agencies, taking photographic evidence, etc.) and how to standardize the recording of relevant information. For example, for bird mortalities, carcasses should be labelled and stored in a freezer until further direction is received from ECCC.