

**Baffinland Mary River Project**  
**Environment and Climate Change Canada Technical Comments**  
**Regarding Revised Aquatic Effects Management Plan (Rev-1)**  
**Submitted for Water Licence 2AM-MRY1325**

<b>Technical Comment Number</b>	ECCC-1
<b>Subject/Topic</b>	Review history
<b>Reference</b>	General
<b>Summary of Issue</b>	<p>On Nov. 2014 ECCC staff provided comments on the 2014 AEMP submission (main document and supporting appendices) for the Baffinland Mary River project. The AEMP was again circulated for review in May 2015, at that time ECCC noted that the 2015 version did not contain any revisions or updates. Baffinland advised ECCC that a revised version would be submitted following licence issuance and that the new version would consider the comments that had been received to date (email, Oliver Curran to ECCC May 11, 2015).</p> <p>The updated AEMP was submitted on Oct. 30th, 2015 and was circulated by the NWB for review in November 2015. This version does include several updates, primarily around monitoring stations and the new licence. It was not apparent in the updated AEMP that ECCC's comments or concerns were included.</p> <p>The outstanding concerns from the previous review can be found in the attached Excel table and additional comments on the EEM section of the AEMP are provided below.</p>
<b>Detailed Technical Comments</b>	See attachment.
<b>Recommendation/Request</b>	Provide a response to comments and concerns raised in Nov. 2014 review.

<b>Technical Comment Number</b>	ECCC-2
<b>Subject/Topic</b>	Additional data collection and evaluation in 2014
<b>Reference</b>	Section 4.2.3 Sediment Quality Study Design
<b>Summary of Issue</b>	The Sediment Quality Study Design section notes that additional pre-mining sediment sampling was needed to improve baseline data for future comparisons, and to include depositional areas. The additional work was to be done in 2014, with appropriate new stations to be identified.
<b>Recommendation/Request</b>	Provide a summary of 2014 field investigations and an update of the study design based on the new data.

<b>Technical Comment Number</b>	ECCC-3
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<b>Subject/Topic</b>	EEM Requirements
<b>Reference</b>	Section 4.1.5 Summary and Schedule Section 4.1 EEM Cycle One Study Design
<b>Summary of Issue</b>	<p>The EEM submission outline was included in the AEMP. The EEM study design for this facility is still outstanding.</p> <p>The objective of the EEM program is to evaluate the effects of mine effluent on fish, fish habitat and the use of fisheries resources. Section 7 of the MMER obligates the mine to conduct EEM studies, submit reports within prescribed timelines and use generally accepted standards of good scientific practice to conduct studies and interpret results. Section 23 of the MMER instructs mines to submit their data to Environment Canada (now ECCC) electronically where a format is provided, or in writing if no such format is provided. Schedule 5 of the MMER presents the specific EEM requirements and is divided into 2 parts, Effluent and Water Quality Monitoring and Biological Monitoring. The main MMER biological monitoring study components have been included in the AEMP but elements of the effluent and water quality monitoring studies appear to be missing. ECCC supports further discussion on how the current effluent and water quality monitoring program outlined in the AEMP could support the information required under the MMER. The facility should include sublethal monitoring in their sampling schedule as per MMER requirements.</p> <p><b>Annual Effluent and Water Quality Monitoring Studies</b></p> <p>The components of effluent and water quality monitoring studies are effluent characterization, sublethal toxicity testing, and water quality monitoring. Schedule 5, Sections 4 - 7 of the MMER outline the required parameters and frequency of monitoring for these components. Note that effluent and water quality monitoring must be conducted 4 times per calendar year not less than one month apart and sublethal toxicity testing must be conducted twice per year (for the first three years, then once per year thereafter) not less than 1 month apart. Note that the first effluent characterization, sublethal toxicity testing and water quality monitoring must be conducted not later than six months after the day on which the Mine became subject to the MMER.</p> <p>Under Schedule 5, Part 1, Section 8, mines must submit not later than March 31st, a report on the effluent and water quality monitoring studies conducted during the previous calendar year. Refer to Schedule 5, Section 8 of the MMER for details on effluent and water quality monitoring reporting requirements. Effluent characterization, water quality, and sublethal toxicity testing information should be reported electronically through the Regulatory Information Submission System (RISS) <a href="https://www.riss-sitdr.ec.gc.ca/riss/Global/Index.aspx">https://www.riss-sitdr.ec.gc.ca/riss/Global/Index.aspx</a>. Information that cannot be reported in RISS must be provided in a hard copy report, including:</p> <ul style="list-style-type: none"> <li>• Quality Assurance/Quality Control (QA/QC) measures, methodologies, and detection limits for</li> </ul>

	<p>chemical parameters</p> <ul style="list-style-type: none"> <li>• QA/QC measures and methodologies for sublethal toxicity testing.</li> </ul> <p>The hard copy submission should be made to the Authorization Officer. In addition, the inclusion of laboratory sheets/certificates of chemical parameter results within the hard copy submission would be appreciated to facilitate our verification of submitted RISS data.</p>
<b>Recommendation/Request</b>	ECCC recommends that Baffinland's AEMP outline how and when the requirements described above will be met.

<b>Technical Comment Number</b>	ECCC-4
<b>Subject/Topic</b>	EEM Cycle One Study design
<b>Reference</b>	Section 4.1 EEM Cycle One Study Design Appendix A Draft EEM Study Design
<b>Summary of Issue</b>	<p>ECCC conducted a high level review of this draft EEM Study Design and has the following comments:</p> <ul style="list-style-type: none"> <li>• facilities are only required to do biological sampling downstream of one FDP, typically from the FDP with the most adverse environmental impact.</li> <li>• Total and dissolved aluminum are very high in CLT-Ref 3 and CLT-Ref 4. Account for this and its potential to confound future sampling programs.</li> <li>• This facility may have the data required to conduct a BACI analysis as part of its EEM program.</li> <li>• It does not appear that the fish sampling program is designed to address any of the endpoints around reproduction. As these are required to be assessed under the MMER further discussion may be required.</li> <li>• Consider looking at YOY surveys in the lakes independently of the adult fish data in the rivers.</li> </ul>
<b>Recommendation/Request</b>	ECCC requests further development of the fish sampling program to address reproduction endpoints and also requests that the study design be updated to address the elevated aluminum levels at reference sites.