



Mackenzie Valley Land and Water Board
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August 8, 2019

File: MV2005L2-0015

Mr. William Liu
Regulatory Specialist
De Beers Canada Inc.
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Dear Mr. Liu:

2018 AEMP Annual Report – Interim Approval
De Beers Canada Inc. – Gahcho Kué Mine

The Mackenzie Valley Land and Water Board (MVLWB or the Board) met on August 8, 2019 and reviewed the 2018 AEMP Annual Report for the Gahcho Kué Mine, which was submitted to fulfill Part I, condition 6 of Licence MV2005L2-0015 on May 1, 2019.

The Board hereby approves the 2018 AEMP Annual Report as an interim submission. De Beers is to submit Version 2 of the AEMP Annual Report in accordance with Table 1 (please see attached) by **September 16, 2019**.

The Board reminds De Beers that the approval of the 2018 AEMP Annual Report does not include approval for De Beers' suggested improvements to the AEMP described in the 2018 AEMP Annual Report. Any changes to the AEMP Design Plan would follow a separate approval process.

The Board directs De Beers to ensure all future AEMP Annual Reports are in accordance with Table 2 (please see attached). De Beers is required to include Table 2 as a concordance table in future AEMP Annual Report submissions.

The Board also reminds De Beers to adhere to the commitments made in their responses to all review comments in the attached Review Summary Table and Table 3 (please see attached) for the submission of the AEMP Re-evaluation Report and AEMP Design Plan update that are due December 13, 2019. De Beers is to include Table 3 in both of those submissions as a concordance table.

If you have any questions or concerns, please contact Angela Love at (867) 766-7456 or email angela.love@mvlwb.com.

Yours sincerely,



Mavis Cli-Michaud
MVLWB, Chair

Copied to: Distribution List

Attached: Tables 1 - 3

Table 1: MV2005L2-0015 – De Beers Canada Inc. - Board Directives for Resubmission of 2018 AEMP Annual Report

Item	Requirements	Review Comment
a)	Revise Key Question 5 to reflect the erosion conditions of Lake E1 ‘minor surface erosion was observed in June 2018 at the Lake E1 outlet and the conditions observed indicated the potential for additional erosion in the future.’ and the mitigation measures ‘Between September 21 and September 26, 2018, a 35 m long channel was excavated and lined with non-woven geotextile and crushed rock to mitigate erosion due to outflow from Lake E1’ in Section 4.4.3.4.	ENR 2
b)	Revise the sentence to Key Question 5 in Section 4.5 on pg 4-68 to indicate ‘no bank instabilities or unnatural erosion were observed along dewatering flow paths downstream of Area 8 or Lake N11.’	ENR 3
c)	Correct the text in section 5.4.1.1.1 o state ‘clear, due to low suspended solids (median turbidity of 0.73 NTU and median TSS of <5.0 mg/L)’.	ENR 11
d)	Update the answer to Key Question 1 in Section 5.7 on pg 5-123 to include ‘Operational discharges from the Mine (i.e., the WMP) to Lake N11 were consistent with EIS predictions and were below the Water Licence EQC approved in 2018. Measured water quality parameter concentrations in Lake N11 and Area 8, which received pumped discharges, remained within EIS predictions, with the exception of the mean/median manganese concentration during ice-cover, which approximated the revised EIS prediction.’	ENR 18
e)	Revise Table 6.4-7 to only include silver and mercury under the response pattern of ‘significant press or pulse BACI effects compared to both reference lakes and an overall response pattern indicating an increasing concentration in the core lake’, and provide clarification in the text for the chromium, molybdenum, and nickel, and reference the associated Table, Figure, and Appendix for those parameters.	ENR 20
f)	Revise the statement ‘significant BACI effects were detected in chlorophyll a concentration between the core lakes (i.e., Area 8 and Lake N11) and one or both reference lakes in 2018.’ to indicate difference were detected between the core lake and both of the references lakes in 2018 in section 7.4.3.2 pg 7-27.	ENR 31
g)	Update Figure 10.3-2 and 10.3-6 with the Figure GNWT-ENR-38a and -38b provided in the supplemental memo.	ENR 38

Table 2: MV2005L2-0015 – De Beers Canada Inc. - Board Directives for future AEMP Annual Report

Item	Requirements	Review Comment
a)	In the Hydrology sections, ensure the relationship between L1, L1a (downstream), and L1b (upstream) is clarified and included on the Hydrological Site Maps	ENR 5
b)	Reference Figures in the text where the exceedances are noted, provide figures or references to figures that visually display the baseline and concentrations of water quality parameters that exceeded guidelines and the natural variation	ENR 13
c)	For sediment quality analyses, either include an additional column with the previous alternate detection level in the detection level comparison table or provide a reference for the previous detection limit in Appendix 6B, Section 6B.2.2.3.	ENR 21-22
d)	Ensure the recommendation section summarizes all the recommendations made in the analysis.	ENR 26
e)	Use one letter ('d' or 'e') to signify that a duplicate sample was collected for Quality Control purposes.	ENR 27
f)	Follow the Quality Assurance and Quality Control procedures as per the approved AEMP Design Plan for Plankton Sampling (chlorophyll a, phytoplankton, and zooplankton' field duplications). If De Beers is proposing to revise the QA/QC procedure, evidence should be provided to the Board with the change. Until then, De Beers should be following the protocol as per the approved AEMP Design Plan.	ENR 28
g)	Include community composition of Lake D2/D3 in the multivariate analysis.	ENR 33
h)	Provide stacked length-frequency plots to illustrate the relative contributions of each sampling methods on the observed population. If other analyses are proposed, please provide justification and indicate how the analysis will help reviewers understand the effects of different fish gear on the sampling results.	ENR 37

Table 3: MV2005L2-0015 – De Beers Canada Inc. - Board Directives for submission of AEMP Re-evaluation Report and/or AEMP Design Plan (due December 13, 2019)

Item	Requirements	Review Comment
a)	De Beers should provide mitigation measure if poor weather conditions were to impede the field crew's ability to conduct sampling.	ENR 1
b)	In the Hydrology sections, ensure the relationship between L1, L1a (downstream), and L1b (upstream) is clarified and included on the Hydrological Site Maps	ENR 5
c)	De Beers should consider re-modelling the future effects of Mine activities on water quantity using recent weather data. De Beers should provide supporting evidence that re-simulation including more recent weather data would in fact results in small changes to EIS results.	ENR 7
d)	Conduct further analysis on the metal exceedance of aluminum, iron, copper, and zinc. Clarify which metals exceeded guidelines under baseline condition, and to what extent the current concentrations have increased above these baseline levels, and provide an assessment of the magnitude of the mine's influence on water quality	ENR 13
e)	De Beers should compare the water quality monitoring data with baseline conditions, and conduct Season Kendall test using data from 2010-2018 for Lake D2/D3 as per the approved AEMP Design Plan.	ENR 15-17
f)	<p>Follow the recommendations as noted in De Beers' response to ENR 24:</p> <ol style="list-style-type: none"> 1. The sampling method used to collect shallow (i.e., top 1-cm) sediment should be reviewed in the Aquatic Effects Re-evaluation Report; 2. Normal ranges for the whole-lake mean concentrations for each sediment quality parameter in the core lakes should be reviewed in the Aquatic Effects Re-evaluation Report to allow inclusion of additional monitoring data collected during the construction phase monitoring (2015 and 2016 data). As part of the re-evaluation, these data will be assessed to determine if they can be used to supplement the baseline dataset (i.e., they are shown to not indicate any Mine-related effect on sediment quality). 	ENR 24
g)	<p>Include the proposed mitigation measures to prevent future sampling error identified in section 8.2.1 of the 2018 AEMP Annual Report.</p> <ol style="list-style-type: none"> 1) A master list of coordinates will be developed for each aquatic monitoring component for the four field programs conducted for the AEMP (i.e., ice-cover [April] and open-water [July, August and September]) and will be used going forward to update the work instructions provided to the field crews. This will eliminate the potential for copy/paste errors during development of work instructions provided to field crews. 2) A 100% QA check of coordinate lists will occur during review of work instructions documents and during each pre-field program meeting conducted between the project management team, the component leads, and the field crew. 	ENR 35

h)	Consider the including investigation of the factors that is contributing to low catchability of Ninespine Stickleback in Area 8 and East Lake, and provide mitigations of altering sampling efforts to meet AEMP requirements.	ENR 39
i)	Review and comment upon the proposed normal range methodology used for fish age, length, and weight data in the context of biological significance. De Beers should discuss whether the low action level for fish health parameter need to be revised.	ENR 40