Angela Love
Mackenzie Valley Land and Water Board
7th floor – 4922 48 St
P.O. Box 213
Yellowknife, NT, X1A 2P6

June 20, 2018

Dear Ms. Love:

Re: Gahcho Kue Mine Amendment Application (March 2018) MV2005L2-0015/MV2005C032
Information Requests Responses – Outstanding Information

De Beers received the request from the Board, dated June 19,2018 for further clarification regarding our responses to some of the information requests arising from the Technical Sessions held for the Gahcho Kué Mine water licence and land use permit March 2018 amendment application. Please find below the additional clarifying information as requested.

IR1

1) *Tables 1-8 and 1-9 are slightly different. What are the EQCs that De Beers is proposing to be discharged from Area 7 to Area 8 to be considered by the Board?*

   De Beers is proposing the same EQC as were presented in the March 2018 Water Licence amendment application for discharge from Area 7 to Area 8. These EQC would apply throughout the life of the mine (Table 1).

Table 1: Recommended Effluent Quality Criteria for the Area 7 Discharge to Area 8

POPC	Effluent Quality Criteria	
	Maximum Average Concentration	Maximum Grab Concentration
Total copper, mg/L	0.002	0.003

mg/L = milligrams per litre; N = nitrogen; POPC = parameters of potential concern.

De Beers is also proposing that in the event De Beers transfers water from the water management pond to Area 7, and wishes to discharge that water to Area 8 for downstream flow mitigation, the EQC presented in Table 1-9 of the response to IR#1 would apply (Table 2). This is a contingency option. De Beers selected the EQC from

Table 1-9, rather than those presented in Table 1-8 because the EQC in Table 1-9 are more conservative.

Table 2: Proposed Effluent Quality Criteria for the Discharge of Water from Area 7 to Area 8 with Water from the Water Management Pond Stored in Area 7 as a Contingency Measure

Parameters of Potential Concern	Effluent Quality Criteria	
	Maximum Average Concentration	Maximum Grab Concentration
Chloride, mg/L	100	200
Fluoride, mg/L	1	2
Nitrate, mg N/L	4	8
Total phosphorus, mg P/L	0.009	0.018
Total aluminum, mg/L	0.083	0.17
Total cadmium, mg/L	0.00004	0.00008
Total chromium, mg/L	0.001	0.002
Total copper, mg/L	0.002	0.003

mg/L = milligrams per litre; N = nitrogen; P = phosphorus.

2) *The EQCs in Tables 1-8 and 1-9 are equal to or below the site-specific water quality objective, with the exception of nitrate. Please clarify.*

The EQC in Tables 1-8 and 1-9 are equal to or below the site-specific water quality objectives (SSWQO) with the exception of nitrate because the method used to calculate effluent quality criteria (EQC) for nitrate concentrations in the discharge from Area 7 to Area 8 was different than the methods described in Sections 3.1.1 to 3.1.3 of the EQC Report (De Beers 2018), included as Attachment 3 to the Water Licence amendment application. The EQC calculated based on the methods described in Sections 3.1.1 to 3.1.3 were not projected to be reasonably and consistently achievable for the Mine. Therefore, to calculate EQC for nitrate concentrations in the discharge from Area 7 to Area 8, a mass balance model of Area 8 was developed. Nitrate concentrations in Area 8 were modelled conservatively, which means that parameters do not undergo processes where settling, decay, formation, or uptake occur. The purpose of the mass balance model was to test different constant concentrations of nitrate in the discharge from Area 7 to Area 8 and compare the resulting whole-lake average nitrate concentrations in Area 8 to the SSWQO. The constant nitrate concentration in the discharge from Area 7 to Area 8 that would maintain nitrate concentrations in Area 8 below the SSWQO was selected as the maximum average concentration EQC. The same

methods were used to calculate nitrate EQC for the discharge of water from the water management pond to Lake N11.

3) *Is De Beers proposing to have this new set of EQCs for all discharges from Area 7 to Area 8 under all circumstances? Or are these EQCs specific to the contingency option as described? In any case, is there a problem with having an EQC for all of the parameters for discharge of water from Area 7 to Area 8 instead of just copper (as originally proposed)?*

Please see the response to point 1 for clarification of the EQC that De Beers is proposing for the discharge of water from Area 7 to Area 8 for downstream flow mitigation.

De Beers developed EQC using a valid method based on guidance from Alberta Environmental Protection (AEP 1995) and the United States Environmental Protection Agency (USEPA 1991). The method has been reviewed by EcoMetrix (De Beers 2014) and used to set water quality-based EQC in Water Licence MV2011L2-0004 for the Snap Lake Mine and W2012L2-0001 for the Jay Project. De Beers stands by this method of generating EQC and does not wish to have additional EQC imposed on it by the MVLWB without justification. That being said, De Beers does anticipate that the water in Area 7 will meet the EQC for discharge described in Table 1-9 throughout the life of the mine.

AEP (Alberta Environmental Protection). 1995. Water Quality Based Effluent Limits Procedures Manual. Edmonton, AB, Canada.

De Beers. 2014. De Beers Canada Inc. Response to Technical Session Information Requests for the Environmental Assessment, Snap Lake Amendment Project EA1314-02 and the Water Licence Amendment (MV2011L2-0004). Prepared for the Mackenzie Valley Land and water Board and the Mackenzie Valley Review Board, Yellowknife, NWT, Canada.

USEPA (United States Environmental Protection Agency). 1991. Technical Support Document for Water Quality-Based Toxics Control. EPA 505-2-90-001. Washington, DC, USA.

4) *Are the values in Tables 1-6 and 1-7 based on 100% water transferred from the water management pond to Area 7 under the contingency option as described? Does this consider the worst-case scenarios for water management pond water quality?*

Yes, the values in Tables 1-6 and 1-7 are based on 100% water transferred from the water management pond (WMP) to Area 7 under the under the contingency options as

described. Scenarios A and B consider WMP water quality in 2019 and 2026 and 2022 and 2026, respectively. Scenarios A and B were selected based on potential constraints in WMP storage capacity in 2019, 2022, and 2026 where the option of storing water in Area 7 may be required. The scenarios were not selected based on water quality concentrations in the WMP. Parameter concentrations in the WMP are projected to increase during the life of the mine. Therefore, projected parameter concentrations in 2026 in the WMP are greater than parameter concentrations in 2019 and 2022.

5) *In the title of the figures 1-1 to 1-8, it references discharge from the water management pond; however, the graphs appear to illustrate water discharged from Area 7 to Area 8. Please clarify.*

There is a typographical error in the titles of Figures 1-1 to 1-8. The figure titles should say 'comparison of calculated effluent quality criteria for parameter "x" to projected Area 7 discharge concentrations'.

6) *The dates on the x-axis of figures 1-1 to 108 references discharge dates that are a year different than in the narrative response. Please clarify.*

The transfer of water from the water management pond (WMP) to Area 7 and the discharge of water from Area 7 to Area 8 for downstream flow mitigation are not projected to occur during the same years. As described in the response to IR#1, in Scenario A, De Beers proposes as a contingency to transfer water from the WMP to Area 7 in July and August of 2019 and July of 2026. Also in Scenario A, De Beers proposes to discharge water from Area 7 to Area 8 for downstream flow mitigation in June, July, and August of 2020, 2022, 2025, and 2027. Figures 1-1 to 1-8 show projected Area 7 concentrations at times when De Beers proposes to discharge water from Area 7 to Area 8 for downstream flow mitigation.

IR 3

7) *Was the accumulation of contaminants over time in Lake N11 accounted for in the graphs presented in figures 3-1 to 3-10?*

Yes, the accumulation of contaminants over time in Lake N11 was accounted for in the graphs presented in Figures 3-1 to 3-10.

Thank you for your consideration of our responses and of our amendment application. Should you have any further questions, please do not hesitate to contact me at 867-688-9227 or sarah.mclean@debeersgroup.com.

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Regards

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