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February 24, 2014

File: L020-01-07

Angela Love
Regulatory Officer
Mackenzie Valley Land & Water Board
Box 2130
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Dear Ms. Love

Gahcho Kué Project Technical Session – Water Quality Tables from the Draft Effluent Quality Report

The information requested by Mr. Todd Slack is presented in the Draft Effluent Quality Criteria Report (De Beers 2013). Baseline concentrations for Lake N11 and the Kirk Lake Watershed are presented in Table 2.2-1 and Appendix C, Table C1; maximum predicted concentrations in the Water Management Pond are presented in Table 2.2-1; and, predicted concentrations at the mixing zone boundary are in Appendix E, Table E4 (De Beers 2013).

Pertinent information related to Mr. Slack's request is summarized in Table 1 of this technical memorandum.

Sincerely,



Veronica Chisholm
Permitting Manager
Gahcho Kué Project

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Table 1: Comparison of Baseline Concentrations (Kirk Lake Watershed), Predicted Concentrations in the Operational Discharge from the Water Management Pond in Year 3 of Operations, and Predicted Maximum Concentrations in Lake N11

Parameter	Units	Kirk Lake Watershed (Updated as of 2013) ^(a)		Predicted Water Management Pond Concentrations ^(b)	Maximum Concentrations at the Edge of Mixing Zone	
		Mean	Mean + 2SD	Maximum	Submerged Diffuser Year 3	
					North Basin	South Basin
Conventional						
Total Dissolved Solids	mg/L	16	39	302	90	101
Major Ions						
Chloride	mg/L	0.7	1.5	152	39	45
Fluoride	mg/L	0.04	0.06	0.13	0.057	0.062
Potassium	mg/L	0.5	0.8	4.6	1.5	1.7
Sulphate	mg/L	0.9	2.5	32	9.1	10
Nutrients						
Nitrate	mg N/L	0.014	0.065	8.4	2.2	2.7
Ammonia	mg N/L	0.02	0.07	8	2.1	2.6
Total Phosphorus	mg/L	0.003	0.007	0.028	0.011	0.012
Total Metals^(c)						
Aluminum	mg/L	0.014	0.045	0.081	0.036	0.039
Antimony	mg/L	0.0001	0.0004	0.0021	0.00057	0.00065
Arsenic	mg/L	0.0001	0.0003	0.0045	0.0013	0.0014
Barium	mg/L	0.0028	0.0053	0.051	0.016	0.018
Beryllium	mg/L	0.00001	0.00001	0.00012	0.000078	0.00008
Boron	mg/L	0.002	0.004	0.16	0.043	0.05
Cadmium	mg/L	0.000009	0.00004	0.000043	0.000026	0.000027
Chromium	mg/L	0.0001	0.0005	0.0015	0.00052	0.00059
Cobalt	mg/L	0.0001	0.0007	0.0012	0.00046	0.00051
Copper	mg/L	0.0008	0.0027	0.0024	0.0016	0.0017
Iron	mg/L	0.06	0.57	0.23	0.1	0.11
Lead	mg/L	0.0001	0.0012	0.00036	0.00014	0.00016
Manganese	mg/L	0.02	0.13	0.05	0.018	0.02
Mercury	mg/L	0.000002	0.000016	0.000013	0.0000072	0.0000077
Molybdenum	mg/L	0.00006	0.00019	0.01	0.0027	0.0032
Nickel	mg/L	0.001	0.002	0.0047	0.0016	0.0019

Table 1: Comparison of Baseline Concentrations (Kirk Lake Watershed), Predicted Concentrations in the Operational Discharge from the Water Management Pond in Year 3 of Operations, and Predicted Maximum Concentrations in Lake N11 (continued)

Parameter	Units	Kirk Lake Watershed (Updated as of 2013) ^(a)		Predicted Water Management Pond Concentrations ^(b)	Maximum Concentrations at the Edge of Mixing Zone	
					Submerged Diffuser Year 3	
		Mean	Mean + 2SD	Maximum	North Basin	South Basin
Selenium	mg/L	0.00004	0.00008	0.00018	0.000071	0.000078
Silver	mg/L	0.00003	0.0003	0.000071	0.000025	0.00003
Strontium	mg/L	0.008	0.014	0.077	0.025	0.028
Thallium	mg/L	0.000003	0.000016	0.00022	0.00007	0.000082
Uranium	mg/L	0.00001	0.00005	0.0021	0.00057	0.00069
Vanadium	mg/L	0.0001	0.0004	0.0031	0.00085	0.00096
Zinc	mg/L	0.003	0.015	0.0086	0.0041	0.0044

Source: De Beers 2013.

^(a) Refers to the baseline concentrations from the Kirk Lake Watershed, represented by the mean and mean + two standard deviations (SD) (De Beers 2013, Appendix C).

^(b) Refers to maximum predicted concentrations in the operational discharge from the WMP (De Beers 2013, Appendix D).

^(c) The term “metals” includes metalloids such as arsenic and non-metals such as selenium.
mg/L = milligrams per Litre; N = nitrogen; SD = standard deviation; WMP = water management pond.

References:

De Beers (De Beers Canada Inc.). 2012. Environmental Impact Statement Supplemental Information Submission for the Gahcho Kué Project. Submitted to the Mackenzie Valley Environmental Impact Review Board, Yellowknife, NWT. April 2012.

De Beers. 2013. Draft Effluent Quality Criteria Report. Gahcho Kué Mine. Submitted to the Mackenzie Valley Land and Water Board. Yellowknife, NWT. December 2013.