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July 5, 2012

Chuck Hubert
Senior EA Officer
Mackenzie Valley Review Board
200 Scotia Centre
Box 938, 5102-50th Ave
Yellowknife, NT
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Dear Mr. Hubert

Re: Update of Receiving Water Quality and Source Loading Predictions for the Operations Period with Revised Winter Dust Emission Assumptions

On May 16th, 2012, Fortune Minerals Limited ("Fortune") participated in a meeting with representatives from the Wek'èezhìi Land and Water Board, Environment Canada, Aboriginal Affairs and Northern Development Canada (AANDC) and the Mackenzie Valley Review Board to discuss the regulatory process for the determination of site specific water quality objectives. This meeting was a follow-up to a meeting that was held with the Tlicho Government and AANDC on April 18th. The minutes of the April 18th meeting are on the public registry. Fortune is still awaiting approval of the minutes form the May 16th meeting.

During this meeting, concerns were raised regarding the receiving water quality projections for metals during operations and the extent to which they may be associated with conservatism in the dust deposition assumptions. Fortune acknowledged these concerns and noted that the winter emissions rates do not incorporate any attenuation, as there appeared to be insufficient information available at the time of the DAR preparation on the effectiveness of snow cover or mitigation strategies that could be safely utilized during winter months to provide a defensible basis for reducing the winter emissions rates. One of the action items from the April 18th meeting was for AANDC to provide a summary of dust monitoring information from northern mining operators who had tested some winter dust mitigation strategies. The summary provided by AANDC indicated that the winter dust mitigation measures resulted in emissions reductions ranging from 50 to 70%. Following receipt of this information, Fortune agreed to re-run the receiving water quality model with revised assumptions for winter dust deposition (50%) and provide estimates of source specific metals loading to the modelled receiving waterbodies.

The results of this analysis show that despite the winter emissions reductions, dust deposition accounts for most of the NICO Project related constituent loading of aluminum, arsenic, chromium, copper and iron to receiving waters during operations relative to site seepages to Nico Lake and discharges from the Effluent Treatment Facility (ETF). Although the loading estimates and receiving water projections incorporating reduced contributions (25-40%) from fugitive dust deposition in winter, the modeling assumptions remain conservative. The dust deposition loading estimates and receiving water projections during operations likely remain overestimated for many metals. Even with this level of conservatism, modeled average concentrations of all parameters listed are below site specific water quality objectives or CCME in the Marian River. The also memo identifies several dust mitigation plans that ill greatly contribute to the reduction of dust generation at the NICO Project.

Seepages and the ETF discharge account for a small portion of loading to the receiving environment for many metals. Once the active closure phase is complete, all dust inputs will cease and water quality in the final closure condition will be controlled by seepages from the CDF and potentially a discharge from the open pit (should it overflow) which will go through treatment wetlands prior to reaching the receiving environment.

I trust this information will help clarify this issue.

Sincerely,

Fortune Minerals Limited

Rick Schryer, Ph.D.
Director of Regulatory and Environmental Affairs

Golder Associates

TECHNICAL MEMORANDUM

DATE 4 July 2012 **PROJECT No.** 0913731004

TO Rick Schryer
Fortune Minerals Limited

CC Lasha Young, Jen Gibson, Gary Ash, John Faithful

FROM Jason Parviainen **EMAIL** jason.parviainen@golder.com

NICO PROJECT: UPDATE OF RECEIVING WATER QUALITY AND SOURCE LOADING PREDICTIONS FOR THE OPERATIONS PERIOD WITH REVISED WINTER DUST EMISSIONS ASSUMPTIONS

1.0 INTRODUCTION

Receiving water quality predictions for the NICO Project, as presented in the Developer's Assessment Report (DAR) (Fortune 2011a) and in a subsequent update to reflect projected effluent quality from the reverse osmosis (RO) based Effluent Treatment Facility (ETF) (Golder 2012), include highly conservative assumptions associated with deposition of fugitive dust. Emissions of fugitive dust from on-site haul roads, the primary sources of particulate matter and metal compounds, do not include potential mitigating effects of weather (such as precipitation or snow-covered ground) or other potential mitigation strategies that could be applied during winter months, which will result in an overestimate of annual air quality predictions and deposition rates. Furthermore, the receiving water quality model assumed no retention of the deposited particulate matter on the landscape and that deposited dust particles, and associated metals, less than 10 microns (µm) in diameter would remain in suspension indefinitely. These highly conservative assumptions have likely resulted in overestimation of metals concentrations in receiving waters during operations.

Concerns have been raised during discussions with regulators and stakeholders regarding the receiving water quality projections for metals during operations and the extent to which they may be associated with conservatism in the dust deposition assumptions. Fortune and Golder acknowledged these concerns and noted that the winter emissions rates do not incorporate any attenuation, as there appeared to be insufficient information available at the time of the DAR preparation on the effectiveness of snow cover or mitigation strategies that could be safely utilized during winter months to provide a defensible basis for reducing the winter emissions rates. In follow-up to these discussions, Aboriginal Affairs and Northern Development Canada (AANDC) looked into the matter and provided a summary of dust monitoring information from northern mining operators who had tested some winter dust mitigation strategies. The summary indicated that the winter dust mitigation measures resulted in emissions reductions ranging from 50 to 70%. Following receipt of this information, Fortune agreed to re-run the receiving water quality model with revised assumptions for winter dust deposition and provide estimates of source specific metals loading to the modelled receiving waterbodies.

The main objectives of this memorandum are to provide estimates of annual loading from NICO Project sources during operations to Nico Lake, Peanut Lake, and Burke Lake, and updated concentration projections for these waterbodies and the Marian River with and without reductions in winter dust deposition loading. A secondary objective of this memorandum is to discuss remaining conservatism in the receiving water projections associated with indefinite particulate suspension and lack of landscape retention of particulates in the water quality model and potential dust loading reductions that could be expected if these processes were considered.

2.0 METHODS

The receiving water quality model, previously updated to reflect projected effluent quality from the RO based ETF (Golder 2012), was updated by reducing deposition rates for dust and associated metals by 50% during winter months (i.e., November through May). This reflects the lower end of the range in winter dust emission attenuation rate information provided by AANDC. No changes were made to other model inputs and assumptions. The updated model was run with the same stochastic sampling sequences as used for the predictions presented in the DAR and in the 2012 update (i.e., 100 realizations were run with the same sequences of daily background flows and chemistry).

3.0 RESULTS AND DISCUSSION

Annual loading of metals from NICO Project sources and projected receiving water concentrations, with and without winter dust emissions reductions, are presented and discussed in the following sections.

3.1 Annual Loading Estimates

Estimates of annual loading of metals from NICO Project sources during operations to Nico Lake, Peanut Lake, and Burke Lake are provided in Table 1. Loading associated with deposition of fugitive dust declined by more than 40% with the incorporation of 50% mitigation of winter dust emissions. Despite the winter emissions reductions, dust deposition accounts for most of the NICO Project related constituent loading of aluminum, arsenic, chromium, copper, and iron to receiving waters during operations relative to site seepages to Nico Lake and discharge from the ETF to Peanut Lake.

3.2 Receiving Water Concentrations

Revised receiving water quality projections (i.e., the average and 95^{th} percentile data projections) for the operations period, with and without winter attenuation of dust emissions, are presented in Table 2 for Nico Lake Peanut Lake, Burke Lake, and the Marian River. Modelled baseline concentrations from the DAR are also included in Table 2 for reference.

Projected receiving water concentrations of many metals declined with reductions in winter dust deposition rates. The most notable reductions were in projected concentrations of aluminum, arsenic, chromium, copper, and iron, as fugitive dust deposition is the primary project related source of these constituents. Projected aluminum concentrations declined by nearly 40% in Nico Lake and by about 33% in Peanut Lake and Burke Lake. Projected arsenic concentrations declined by about 33% in Nico Lake, Peanut Lake, and Burke Lake. Projected iron concentrations declined by about 30% in Nico Lake, by 30 to 35% in Peanut Lake, and by 25 to 30% in Burke Lake. Projected concentrations of chromium and copper decline by less than 30%, but are projected to be below CCME guidelines in Burke Lake.

3.3 Additional Dust Loading Considerations

Although the loading estimates and receiving water projections incorporating reduced contributions from fugitive dust deposition in winter, the modelling assumptions remain conservative. The receiving water quality model assumed no retention of deposited dust on the landscape and that deposited dust particles, and associated metals, less than 10 µm in diameter would remain in suspension indefinitely. It would be expected that some of the deposited particulates would infiltrate into soils and that there would be additional settling of particulates in the water column, particularly during the winter months, which would reduce the effective loading of metals to receiving waters. As such, the dust deposition loading estimates and receiving water projections during operations presented above likely remain overestimated for many metals.

Land surface areas account for about 80% of the Burke Lake watershed area (Annex G of Fortune 2011a). Portions of the land surface areas with soil and vegetation cover would be expected to trap a portion of fugitive dust deposited. For example, if 25 to 50% of dust deposited on land surface areas was retained on the landscape, this would translate to a reduction in receiving water loading from dust and associated metals of about 20 to 40%.

The receiving water modelling assumption that deposited dust particles, and associated metals, less than 10 µm in diameter would remain in suspension in the water column is conservative. Fugitive dust particles less than 2.5 µm in size account for less than 10% of the 10 µm size fraction and, based on settling velocities for 2.5 µm particles (Wu and Wang 2006), a large portion of the less than 10 µm size fraction would be expected to settle out under ice within in a month or two. For example, if all fugitive dust particles larger than 2.5 µm settle out under ice, this effectively represents removal of more than 90% of residual loading associated with fugitive dust. As a more conservative example, if only half of fugitive dust particles between 2.5 and 10 µm in size settle out during periods of low flow following freshet or under ice cover, this similarly represents an effective removal of more than 45% of residual loading associated with fugitive dust.

Fortune will be mitigating dust at the NICO site wherever practical. Fortune has developed dust mitigation plans based on knowledge of the area including the terrain and meteorology surrounding the NICO Project, and has committed to the following dust mitigation (Fortune 2011b):

- spraying water on haul roads to maintain sufficient surface moisture during summer months;
- establishing and enforcing speed limits on unpaved surfaces to minimize dust from vehicle operations;
- equipping construction equipment with upswept exhausts to enhance dispersion of exhaust;
- equipping the fleet and other equipment with industry-standard emission control systems;
- constructing the NICO Project Access Road as narrow as possible, while maintaining safe construction practices;
- enclosing conveyance systems and processing facilities;
- limiting the height from which material is dropped;
- using high efficiency bag houses for point sources of releases;
- watering ore stockpiles and the primary crusher;
- revegetating the parts of the mine site that will not be disturbed in the future; and
- controlling dumping or transfer rates of materials.

Fortune is also examining the winter dust mitigation information provided by AANDC for incorporation into its dust mitigation plans.

Seepages and the ETF discharge account for a small portion of loading to the receiving environment for many metals (Table 1). Once the active closure phase is complete, all dust inputs will cease and water quality in the final closure condition will be controlled by seepages from the CDF which will go through treatment wetlands prior to reaching Nico Lake, and discharges from the treatment wetlands for the flooded Open Pit.

4.0 CLOSURE

We trust that this memorandum meets your needs. If you require more information, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Jason Parviainen, M.Sc.
Water Quality Specialist

Gary Ash, M.Sc., P.Biol.
Principal

JP/GA/jg

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5.0 REFERENCES

Fortune (Fortune Minerals Limited). 2011a. NICO Cobalt-Gold-Bismuth-Copper Project: Developer's Assessment Report. Submitted to the Mackenzie Valley Review Board. May 2011.

Fortune. 2011b. NICO Cobalt-Gold-Bismuth-Copper Project: Information Request Responses. Submitted to the Mackenzie Valley Review Board. December 2011.

Golder (Golder Associates Ltd.). 2012. Technical Memorandum: NICO Project – Update of receiving water quality predictions for the operations period with revised effluent treatment facility discharge quality. Submitted to Fortune Minerals Limited.

Wu, W. and S. Wang. 2006. Formulas for Sediment Porosity and Settling Velocity. J. Hydraul. Eng. 132, 858-862

Table 1: Metals Loading Rate Estimates for NICO Project Sources During Operations (kg/year)

Constituent	Nico Lake				Peanut Lake				Burke Lake	
	Dust Deposition		Site Seepages		Dust Deposition		ETF discharge		Dust Deposition	
	No Winter Attenuation	50% Winter Attenuation	Early Operations	Late Operations	No Winter Attenuation	50% Winter Attenuation	Early Operations	Late Operations	No Winter Attenuation	50% Winter Attenuation
Aluminum	362	204	17.2	40.5	396	223	17.9	110	362	204
Antimony	0.079	0.044	0.16	0.37	0.091	0.051	0.48	2.19	0.083	0.047
Arsenic	10.5	5.9	2.31	3.55	13.2	7.4	1.21	5.38	12.2	6.8
Barium	3.90	2.19	0.66	1.61	4.21	2.37	1.07	3.56	3.84	2.16
Beryllium	0.013	0.007	0.013	0.023	0.014	0.008	0.003	0.018	0.013	0.007
Boron	-	-	1.31	4.10	-	-	15.4	105	-	-
Cadmium	0.0093	0.0052	0.0077	0.0042	0.015	0.0083	0.0013	0.0032	0.014	0.0078
Chromium	0.37	0.21	0.062	0.054	0.40	0.23	0.030	0.075	0.37	0.21
Cobalt	1.30	0.73	0.76	0.91	1.63	0.92	0.58	1.52	1.50	0.84
Copper	0.98	0.55	0.11	0.17	1.10	0.62	0.069	0.20	1.00	0.56
Iron	761	428	82.7	153	856	482	22.3	69.8	783	440
Lead	0.047	0.027	0.058	0.084	0.055	0.031	0.0098	0.053	0.050	0.028
Manganese	4.14	2.33	2.80	3.10	4.86	2.73	0.36	0.85	4.45	2.50
Mercury	0.00025	0.00014	0.0017	0.0012	0.00026	0.00014	0.00066	0.0022	0.00029	0.00017
Molybdenum	0.035	0.020	0.24	0.51	0.040	0.023	1.00	5.08	0.037	0.021
Nickel	0.10	0.057	0.061	0.099	0.12	0.065	0.077	0.35	0.11	0.059
Phosphorus	1.48	0.83	1.12	1.10	1.58	0.89	2.58	12.8	1.44	0.81
Selenium	0.033	0.018	0.24	0.82	0.036	0.020	0.35	0.87	0.033	0.018
Silver	0.0025	0.0014	0.029	0.012	0.0034	0.0019	0.067	0.17	0.0032	0.0018
Thallium	0.0040	0.0023	0.29	0.11	0.0046	0.0026	0.044	0.11	0.0041	0.0023
Uranium	0.045	0.025	0.87	1.58	0.051	0.029	0.12	0.52	0.047	0.026
Vanadium	0.26	0.15	0.023	0.036	0.29	0.16	0.015	0.051	0.27	0.15
Zinc	0.22	0.12	0.63	1.10	0.24	0.14	0.34	1.01	0.22	0.12

Notes:

- Dust deposition loads are incremental values above baseline loads
- Dust deposition loads are based on assumed summer emissions mitigation of 80% of maximum rates and winter attenuation assumptions as noted
- Dust deposition loads include constituent mass associated with the PM_{10} fraction (i.e., particles less than or equal to 10 microns in diameter)
- Dust deposition loads include mass deposited directly to lake surfaces and within contributing watershed areas
- Project source loads presented for Peanut Lake do not include upstream inputs from Nico Lake
- Project source loads presented for Burke Lake do not include upstream inputs from Peanut Lake or Nico Lake

Table 2: Summary of Baseline and Operations Receiving Water Quality Modelling Projections for the Fortune NICO Project

Parameter	Units	CCME Freshwater Aquatic Life Guidelines	Site Specific Water Quality Objectives (Revised June 2012)	Nico Lake						Peanut Lake						Burke Lake						Marian River					
				Modelled Baseline[a] (As Presented in DAR)		Operations[b] No Winter Dust Mitigation		Operations[b] 50 Percent Winter Dust Mitigation		Modelled Baseline[a] (As Presented in DAR)		Operations[b] No Winter Dust Mitigation		Operations[b] 50 Percent Winter Dust Mitigation		Modelled Baseline[a] (As Presented in DAR)		Operations[c] No Winter Dust Mitigation		Operations[c] 50 Percent Winter Dust Mitigation		Modelled Baseline[a] (As Presented in DAR)		Operations[c] No Winter Dust Mitigation		Operations[c] 50 Percent Winter Dust Mitigation	
				Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile	Average	95th %ile
Major Ions and TDS																											
Calcium	mg/L	-	-	9.1	11.7	6.78	8.33	6.78	8.14	8.1	10.8	19.2	12.8	19.2	12.8	8.77	12.8	12.8	18.0	12.8	18.0	25.5	51.1	25.6	51.0	25.6	51.0
Chloride	mg/L	120	353	0.8	1.7	1.63	2.07	1.63	2.07	0.9	1.3	11.6	24.1	11.6	24.1	1.18	1.6	5.0	9.6	5.0	9.6	1.7	5.4	2.8	5.5	2.8	5.5
Magnesium	mg/L	-	-	4.2	5.5	3.53	4.36	3.53	4.36	3.3	5.2	3.0	5.3	3.0	5.3	3.5	5.4	3.3	5.2	3.3	5.2	12.0	12.0	10.9	21.8	10.9	21.8
Potassium	mg/L	-	-	1.7	1.5	5.32	7.56	5.32	7.56	1.7	1.7	52.6	113	52.7	113	1.3	1.6	19.9	42.7	19.9	42.7	3.9	3.9	2.4	5.0	2.4	5.0
Sodium	mg/L	-	-	1.7	1.6	2.99	3.49	2.99	3.49	1.7	3.8	12.3	21.1	12.3	21.1	2.8	3.8	6.1	9.8	6.1	9.8	3.8	7.5	3.9	7.7	3.9	7.7
Sulphate	mg/L	-	500	3.9	5.5	4.72	6.40	0.77	6.40	1.6	7.5	29.4	61.4	29.4	61.4	2.0	3.9	11.7	23.4	11.7	23.4	10.9	42.0	21.1	42.2	21.1	42.2
Total Dissolved Solids	mg/L	-	-	54.0	78.2	56.9	70.6	56.9	70.6	42.6	70.3	157	289	157	289	42.3	66.9	84.1	127	83.7	127	119	239	120	239	120	239
Nutrients																											
Nitrate	mg N/L	2.93	6.09	0.020	0.14	0.45	0.68	0.45	0.68	0.056	0.15	1.94	4.15	1.94	4.15	0.052	0.77	0.77	1.64	0.78	1.64	0.052	0.15	0.079	0.19	0.079	0.19
Ammonia	mg N/L	1.1	-	0.015	0.048	0.41	0.65	0.41	0.65	0.020	0.050	0.33	0.65	0.33	0.65	0.020	0.042	0.15	0.27	0.15	0.27	0.028	0.065	0.032	0.072	0.032	0.072
Total Kjeldahl Nitrogen	mg N/L	-	-	0.77	1.05	2.07	1.28	1.01	1.28	0.60	1.22	0.84	1.22	0.84	1.22	0.60	0.93	0.69	1.01	0.69	1.01	0.76	1.51	0.76	1.51	0.76	1.51
Total Phosphorus	mg P/L	-	-	0.020	0.015	0.019	0.015	0.018	0.012	0.015	0.018	0.018	0.012	0.012	0.012	0.015	0.012	0.016	0.019	0.016	0.019	0.0088	0.018	0.0089	0.018	0.0089	0.018
Total Metals																											
Aluminum	mg/L	0.1	0.41	0.056	0.012	**0.84**	**1.21**	**0.51**	**0.80**	0.099	0.14	**0.46**	**0.79**	0.33	**0.51**	0.090	0.12	0.15	***0.61***	0.14	0.14	0.012	0.020	0.045	**0.10**	0.039	0.082
Antimony	mg/L	0.006	0.03	0.00012	0.00028	0.00092	0.0012	0.00085	0.0012	0.00025	0.00028	0.0012	0.0012	0.0012	0.0010	0.00025	0.00012	0.00061	0.00099	0.00058	0.00094	0.000025	0.000050	0.000035	0.000076	0.000035	0.000074
Arsenic	mg/L	0.005	0.05	0.014	0.016	0.028	0.044	0.019	0.020	0.0040	0.0042	0.014	0.012	0.009	0.012	0.0018	0.0012	**0.010**	**0.019**	**0.007**	**0.012**	0.00043	0.0010	0.00064	0.0017	0.00054	0.0014
Barium	mg/L	-	1	0.0078	0.012	0.018	0.012	0.014	0.012	0.0092	0.011	0.012	0.016	0.012	0.012	0.0040	0.012	0.012	0.015	0.012	0.012	0.015	0.010	0.015	0.030	0.015	0.030
Beryllium	mg/L	-	-	0.000012	0.000014	0.000012	0.00012	0.000060	0.00009	0.000012	0.000012	0.000012	0.000048	0.000016	0.000018	0.000012	0.000012	0.000014	0.000025	0.000010	0.000027	0.000012	0.000012	0.000012	0.000032	0.000011	0.000032
Boron	mg/L	1.5	-	0.0070	0.012	0.012	0.015	0.012	0.015	0.0073	0.0094	0.019	0.014	0.019	0.079	0.0061	0.0082	0.012	0.010	0.012	0.030	0.012	0.015	0.012	0.036	0.017	0.036
Cadmium	mg/L	0.000017	-	0.000012	0.000019	**0.000045**	**0.000058**	**0.000012**	**0.000045**	0.000010	0.000025	**0.000014**	**0.000034**	**0.000018**	**0.000019**	0.0000091	0.000019	**0.000019**	**0.000019**	0.000025	**0.000014**	0.000016	0.000047	0.000016	**0.000047**	0.000016	**0.000047**
Chromium	mg/L	0.001	-	0.00043	0.00052	0.0012	0.0018	0.0010	0.0012	0.00055	0.00025	0.00087	0.0012	0.00012	0.0009	0.00058	0.00076	0.00085	**0.0012**	0.00071	0.0009	0.00028	0.00076	0.00019	0.00077	0.00039	0.00077
Cobalt	mg/L	-	0.03	0.00036	0.00061	0.0043	0.0070	0.0012	0.0052	0.00020	0.00012	0.0019	0.0043	0.0012	0.0012	0.00012	0.00030	0.0015	0.0078	0.0012	0.0019	0.00020	0.00020	0.00028	0.00029	0.00013	0.00025
Copper	mg/L	0.001	0.022	0.0018	0.0020	0.0015	0.0049	0.0016	0.0015	0.0012	0.0019	0.0019	0.0018	0.0015	0.0010	0.0012	0.0019	0.0018	**0.0015**	0.0015	0.0019	0.00064	0.0012	0.00061	0.0017	0.00066	0.0017
Iron	mg/L	0.1	1.5	0.38	0.46	**1.21**	**3.29**	**1.53**	**1.21**	0.37	0.48	1.09	**1.75**	0.77	1.14	0.38	0.47	**0.93**	**1.46**	**0.69**	**1.00**	0.14	0.77	0.16	**0.31**	0.15	0.29
Lead	mg/L	0.001	0.001	0.00007	0.00020	0.00030	0.00043	0.00026	0.00036	0.000025	0.00025	0.00025	0.00012	0.00012	0.00028	0.000080	0.00012	0.00012	0.00028	0.00012	0.00026	0.000068	0.00019	0.000010	0.00029	0.000070	0.00029
Manganese	mg/L	-	0.7	0.012	0.012	0.018	0.048	0.014	0.044	0.014	0.052	0.027	0.055	0.015	0.054	0.015	0.048	0.028	0.052	0.016	0.050	0.031	0.062	0.031	0.062	0.031	0.062
Mercury	mg/L	0.000026	0.00026	0.0000088	0.000012	0.000012	0.000025	0.000012	0.000014	0.0000088	0.000014	0.0000093	0.000014	0.0000091	0.000014	0.0000087	0.000012	0.0000091	0.000012	0.0000090	0.000012	0.000012	0.000078	0.000011	**0.000077**	0.000011	**0.000077**
Molybdenum	mg/L	0.073	-	0.00049	0.00058	0.00093	0.0012	0.00090	0.0012	0.00012	0.00020	0.0020	0.0040	0.0019	0.0019	0.00012	0.00025	0.00084	0.0016	0.00043	0.0016	0.00012	0.00042	0.00012	0.00046	0.00023	0.00046
Nickel	mg/L	0.025	-	0.00052	0.00088	0.00085	0.0012	0.00076	0.0010	0.00019	0.0012	0.00095	0.0019	0.00090	0.0018	0.00012	0.0012	0.00083	0.0012	0.00080	0.0012	0.00100	0.0070	0.00100	0.0020	0.00100	0.0020
Selenium	mg/L	0.001	0.0035	0.00028	0.00019	0.0012	0.0012	0.0012	0.0016	0.00028	0.00028	0.00069	0.0012	0.00061	0.0012	0.00012	0.00012	0.00012	0.00052	0.00036	0.00036	0.00028	0.00020	0.00019	0.00070	0.00019	0.00070
Silver	mg/L	0.0001	-	0.0000064	0.0000090	0.000058	0.000083	0.000051	0.000080	0.0000064	0.000012	0.000092	**0.00019**	0.000090	**0.00028**	0.0000062	0.0000099	0.000041	0.000079	0.000040	0.000012	0.0000027	0.000012	0.0000042	0.000015	0.0000041	0.000014
Thallium	mg/L	0.0008	-	0.0000027	0.0000073	0.00043	0.00020	0.00042	0.00020	0.0000016	0.0000027	0.00012	0.00020	0.00012	0.00020	0.0000015	0.0000020	0.000063	0.00012	0.000062	0.00020	0.0000013	0.0000027	0.0000027	0.0000060	0.0000027	0.0000059
Uranium	mg/L	0.025	-	0.00012	0.00043	0.0016	0.0040	0.0016	0.0019	0.00020	0.00019	0.00012	0.0010	0.00012	0.0010	0.00012	0.00012	0.00049	0.00068	0.00048	0.00066	0.00086	0.0012	0.00043	0.0017	0.00087	0.0017
Vanadium	mg/L	-	0.006	0.00012	0.00052	0.00092	0.0012	0.00069	0.00088	0.00028	0.00028	0.00059	0.00092	0.00046	0.00085	0.00040	0.00012	0.00058	0.00087	0.00050	0.00080	0.00042	0.0012	0.00043	0.0011	0.00042	0.0011
Zinc	mg/L	0.03	-	0.0044	0.0053	0.0064	0.0080	0.0061	0.0077	0.0044	0.0058	0.0046	0.0052	0.0045	0.0056	0.0045	0.0057	0.0042	0.0058	0.0046	0.0058	0.0070	0.014	0.0070	0.023	0.0070	0.023
Dissolved Metals																											
Aluminum	mg/L	0.1	0.41	0.025	0.050	0.14	0.39	0.77	0.33	0.044	0.094	0.77	0.79	0.09	0.77	0.040	0.083	0.095	**0.14**	0.018	**0.18**	0.016	0.045	0.012	0.057	0.019	0.051
Antimony	mg/L	0.006	0.03	0.00023	0.00012	0.00012	0.00061	0.00019	0.00068	0.00028	0.00028	0.00052	0.0012	0.00038	0.0012	0.00028	0.00012	0.00012	0.00059	0.00012	0.00064	0.000018	0.000040	0.000016	0.000058	0.000025	0.000057
Arsenic	mg/L	0.005	0.05	0.011	0.015	0.016	0.031	0.012	0.012	0.0019	0.0044	0.0093	0.019	0.0067	0.012	0.0012	0.0010	**0.0077**	**0.015**	0.0050	**0.010**	0.00025	0.0009	0.00054	0.0014	0.00045	0.0012
Barium	mg/L	-	1	0.0068	0.0095	0.012	0.018	0.010	0.019	0.0019	0.0099	0.0094	0.014	0.0089	0.012	0.0012	0.010	0.0088	0.012	0.0085	0.012	0.012	0.012	0.012	0.027	0.013	0.027
Beryllium	mg/L	-	-	0.0000092	0.000012	0.000012	0.000038	0.000026	0.000040	0.0000080	0.000010	0.000014	0.000012	0.000014	0.000025	0.000008	0.000010	0.000012	0.000018	0.000012	0.000016	0.0000028	0.000024	0.0000080	0.000024	0.0000080	0.000024
Boron	mg/L	1.5	-	0.0058	0.0088	0.0059	0.010	0.0069	0.012	0.0059	0.0081	0.012	0.049	0.016	0.055	0.0050	0.0069	0.012	0.020	0.012	0.012	0.014	0.020	0.014	0.030	0.014	0.030
Cadmium	mg/L	0.000017		0.0000046	0.000010	0.0000054	0.000016	0.0000057	0.000016	0.0000041	0.000010	0.0000041	0.000012	0.0000046	0.000012	0.0000028	0.0000091	0.0000041	0.000012	0.0000041	0.000010	0.0000073	0.000024	0.0000071	**0.000024**	0.0000071	**0.000023**
Chromium	mg/L	0.001	-	0.00022	0.00019	0.00025	0.00061	0.00025	0.00058	0.00028	0.00052	0.00024	0.00052	0.00025	0.00052	0.00019	0.00052	0.00076	0.00052	0.00012	0.00055	0.00012	0.00052	0.00012	0.00051	0.00021	0.00051
Cobalt	mg/L	-	0.01	0.00024	0.00043	0.0015	0.0034	0.0019	0.0019	0.00012	0.00028	0.0010	0.0012	0.0009	0.0019	0.00012	0.0002	0.00012	0.0016	0.00052	0.0012	0.000070	0.00036	0.000096	0.00022	0.000087	0.00020
Copper	mg/L	0.002	0.022	0.0013	0.0018	0.0012	0.0015	0.0012	0.0012	0.00082	0.0012	0.00092	0.0016	0.00084	0.0019	0.00086	0.0012	0.00095	0.0016	0.00090	0.0019	0.00048	0.0012	0.00049	0.0013	0.00049	0.0013
Iron	mg/L	0.3	1.5	0.21	0.36	0.53	1.21	0.48	1.21	0.77	0.37	0.36	0.83	'0.31	0.65	0.77	0.36	**0.14**	0.15	**0.79**	0.60	0.087	0.14	0.091	0.21	0.088	0.20
Lead	mg/L	0.001	0.001	0.000042	0.000016	0.000045	0.00020	0.000092	0.00020	0.000044	0.00020	0.000056	0.00012	0.000057	0.00012	0.000048	0.00009	0.000051	0.00012	0.000051	0.00012	0.000041	0.00019	0.000041	0.00019	0.000043	0.00019
Manganese	mg/L	-	0.7	0.013	0.028	0.012	0.012	0.014	0.012	0.014	0.012	0.012	0.079	0.012	0.016	0.014	0.031	0.012	0.012	0.012	0.012	0.019	0.046	0.019	0.045	0.019	0.046
Mercury	mg/L	0.000026	0.00026	0.0000018	0.0000013	0.00000063	0.0000013	0.00000093	0.0000019	0.0000019	0.0000027	0.00000082	0.0000019	0.00000110	0.0000024	0.0000019	0.0000016	0.00000093	0.0000020	0.00000118	0.0000024	0.0000030	0.000019	0.0000028	0.000018	0.0000028	0.000018
Molybdenum	mg/L	0.073	-	0.00041	0.00052	0.00050	0.00088	0.00056	0.00095	0.00019	0.00026	0.0012	0.0012	0.0019	0.0030	0.00012	0.00012	0.00052	0.0012	0.00061	0.0012	0.00012	0.00012	0.00019	0.00040	0.00019	0.00040
Nickel	mg/L	0.025	-	0.00040	0.00069	0.00040	0.00019	0.00043	0.00077	0.00060	0.0010	0.00055	0.0010	0.00058	0.0010	0.00056	0.00089	0.00052	0.00088	0.00052	0.00088	0.00028	0.0016	0.00012	0.0016	0.00078	0.0016
Selenium	mg/L	0.001	0.0035	0.00012	0.00012	0.00059	0.00069	0.00020	0.00087	0.00012	0.00020	0.00044	0.00061	0.00088	0.00012	0.00012	0.00028	0.00025	0.00025	0.00012	0.00028	0.00076	0.00060	0.00076	0.00060	0.00016	0.00060
Uranium	mg/L	0.015	-	0.00027	0.00012	0.0015	0.0030	0.0012	0.0012	0.00012	0.00026	0.00044	0.00085	0.00052	0.00086	0.00019	0.00028	0.00028	0.00058	0.00036	0.00052	0.00012	0.0015	0.00012	0.0015	0.00073	0.0015
Vanadium	mg/L	-	0.006	0.00018	0.00028	0.00020	0.00050	0.00020	0.00043	0.00028	0.00043	0.00028	0.00043	0.00028	0.00049	0.00012	0.00043	0.00020	0.00043	0.00020	0.00043	0.00025	0.00012	0.00024	0.00071	0.00025	0.00071
Zinc	mg/L	0.03	-	0.0026	0.0044	0.0012	0.0042	0.0012	0.0048	0.0015	0.0046	0.0016	0.0038	0.0019	0.0042	0.0015	0.0045	0.0019	0.0042	0.0012	0.0042	0.0043	0.015	0.0042	0.015	0.0043	0.015

Operations predictions based on revised ETF design using RO system with chemical and biological treatment of brine

[a] = Values in yellow highlight are above CCME guidelines under modelled baseline conditions.

[b] = Values in bold are greater than site specific water quality objectives [SSWQO] or above CCME guidelines for parameters that do not have a SSWQO.

[c] = Predicted values in bold are higher than CCME guidelines, values in bold italics are higher than site specific water quality objectives.