

Appendix 13-D

Contaminants of Potential Concern (COPC)
Screening Results for Brucejack Lake Outflow,
Modelled Cases 1 to 9

Table 13-D1. Brucejack Lake Outlet Hazard Quotients, Basecase

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00241	0.002	n/a	0.002	n/a	0.231	0.295	0.2	n/a	0.3	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.199	0.260	0.2	n/a	0.3	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.03	0.013	n/a	0.003	n/a	6.37	7.57	0.04	n/a	0.01	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	5.78	6.88	0.04	n/a	0.01	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.088	0.089	0.009	n/a	0.009	n/a	0.232	0.318	0.02	n/a	0.03	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.088	0.089	0.009	n/a	0.009	n/a	0.211	0.223	0.02	n/a	0.02	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.000157	n/a	0.000158	n/a	0.00492	0.00579	0.0005	n/a	0.0006	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.000158	n/a	0.000158	n/a	0.00450	0.00523	0.0004	n/a	0.0005	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	15.7	16.5	0.123	n/a	0.129	n/a	28.4	32.0	0.2	n/a	0.2	n/a
High Flow	-	-	128	-	26.3	33.0	15.9	16.3	0.124	n/a	0.128	n/a	26.6	30.0	0.2	n/a	0.2	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0178	0.0207	0.036	n/a	0.041	n/a	0.0305	0.0352	0.06	n/a	0.07	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0181	0.0199	0.036	n/a	0.040	n/a	0.0283	0.0327	0.06	n/a	0.07	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00321	0.00401	0.006	n/a	0.008	n/a	0.00531	0.00618	0.01	n/a	0.01	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00329	0.00378	0.007	n/a	0.008	n/a	0.00486	0.00568	0.01	n/a	0.01	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000017	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00068	0.00085	0.01	n/a	0.02	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00060	0.00076	0.01	n/a	0.02	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00032	0.00046	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00028	0.00041	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00092	0.00115	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00084	0.00105	0.003	n/a	0.003	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0778	0.101	0.3	n/a	0.3	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0696	0.0909	0.2	n/a	0.3	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.0001	n/a	0.0002	n/a	0.00007	0.00008	0.0003	n/a	0.0004	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.0001	n/a	0.0002	n/a	0.00006	0.00008	0.0003	n/a	0.0004	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D1. Brucejack Lake Outlet Hazard Quotients, Basecase

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0030	0.0038	0.004	n/a	0.005	n/a	0.0672	0.100	0.096	n/a	0.128	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0031	0.0036	0.004	n/a	0.004	n/a	0.0583	0.0877	0.080	n/a	0.102	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00077	0.00087	0.002	n/a	0.002	n/a	0.00456	0.00586	0.009	n/a	0.01	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00078	0.00084	0.002	n/a	0.002	n/a	0.00402	0.00524	0.008	n/a	0.01	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.00065	0.00077	0.001	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.00059	0.00071	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00037	0.006	n/a	0.007	n/a	0.00057	0.00068	0.01	n/a	0.01	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00035	0.007	n/a	0.007	n/a	0.00053	0.00063	0.01	n/a	0.01	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000059	0.0001	n/a	0.0001	n/a	0.00002	0.00002	0.0004	n/a	0.0005	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.0001	n/a	0.0001	n/a	0.00002	0.00002	0.0003	n/a	0.0004	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000015	0.042	n/a	0.050	n/a	0.000019	0.000023	0.06	n/a	0.08	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.042	n/a	0.048	n/a	0.000018	0.000021	0.06	n/a	0.07	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00151	0.003	n/a	0.003	n/a	0.00557	0.0112	0.01	n/a	0.02	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00148	0.00151	0.003	n/a	0.003	n/a	0.00509	0.0102	0.01	n/a	0.02	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0105	0.0138	0.210	n/a	0.138	n/a	0.0235	0.0283	0.5	n/a	0.3	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0109	0.0128	0.218	n/a	0.128	n/a	0.0212	0.0258	0.4	n/a	0.3	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0749	0.0984	0.2	n/a	0.3	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0667	0.0880	0.2	n/a	0.3	n/a

Notes:

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							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.114	0.185	0.114	n/a	0.185	n/a	0.0213	0.0427	0.021	n/a	0.043	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.082	0.142	0.082	n/a	0.142	n/a	0.0159	0.0333	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	4.98	6.76	0.033	n/a	0.011	n/a	2.65	3.19	0.018	n/a	0.005	n/a
High Flow	-	-	150	600	0.393	1.00	4.16	5.69	0.028	n/a	0.009	n/a	2.50	2.95	0.017	n/a	0.005	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.115	0.129	0.011	n/a	0.013	n/a	0.0953	0.100	0.010	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.108	0.120	0.011	n/a	0.012	n/a	0.0942	0.0978	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00349	0.00467	0.000349	n/a	0.000467	n/a	0.00195	0.00231	0.0002	n/a	0.0002	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00296	0.00396	0.000296	n/a	0.000396	n/a	0.00187	0.00215	0.0002	n/a	0.0002	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	21.9	26.1	0.171	n/a	0.204	n/a	16.5	17.7	0.129	n/a	0.139	n/a
High Flow	-	-	128	-	26.3	33.0	20.0	23.6	0.156	n/a	0.184	n/a	16.2	17.2	0.126	n/a	0.134	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0202	0.0236	0.040	n/a	0.047	n/a	0.0158	0.0168	0.032	n/a	0.034	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0187	0.0216	0.037	n/a	0.043	n/a	0.0155	0.0163	0.031	n/a	0.033	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00362	0.00404	0.007	n/a	0.008	n/a	0.00314	0.00331	0.006	n/a	0.007	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00333	0.00373	0.007	n/a	0.007	n/a	0.00299	0.00315	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000012	0.000017	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000010	0.000014	0.001	n/a	0.001	n/a	0.000006	0.000007	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00027	0.00040	0.005	n/a	0.008	n/a	0.00010	0.00014	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00021	0.00032	0.004	n/a	0.006	n/a	0.00009	0.00012	0.002	n/a	0.002	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00014	0.00020	0.000	n/a	0.000	n/a	0.00007	0.00008	0.0001	n/a	0.0002	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00012	0.00017	0.000	n/a	0.000	n/a	0.00006	0.00008	0.0001	n/a	0.0002	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00073	0.00102	0.002	n/a	0.003	n/a	0.00035	0.00044	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00060	0.00085	0.002	n/a	0.003	n/a	0.00033	0.00040	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0378	0.0500	0.126	n/a	0.167	n/a	0.0217	0.0254	0.072	n/a	0.085	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0321	0.0426	0.107	n/a	0.142	n/a	0.0207	0.0237	0.069	n/a	0.079	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00005	0.00006	0.000	n/a	0.000	n/a	0.00003	0.00004	0.0002	n/a	0.0002	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00004	0.00006	0.000	n/a	0.000	n/a	0.00003	0.0000	0.0002	n/a	0.0002	n/a

Notes:

- guideline not available

HQ = hazard quotient

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Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0262	0.0412	0.037	n/a	0.053	n/a	0.007	0.011	0.009	n/a	0.014	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0194	0.0322	0.026	n/a	0.037	n/a	0.005	0.009	0.007	n/a	0.011	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00170	0.00218	0.003	n/a	0.004	n/a	0.00109	0.00125	0.002	n/a	0.002	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00145	0.00188	0.003	n/a	0.004	n/a	0.00101	0.00115	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00038	0.00047	0.001	n/a	0.001	n/a	0.00027	0.00030	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00035	0.00042	0.001	n/a	0.001	n/a	0.00027	0.00029	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00034	0.00039	0.007	n/a	0.008	n/a	0.00028	0.00030	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00032	0.00036	0.006	n/a	0.007	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.0001	n/a	0.0001	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.0001	n/a	0.0001	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000011	0.000013	0.038	n/a	0.043	n/a	0.000009	0.000010	0.032	n/a	0.033	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000011	0.000012	0.036	n/a	0.040	n/a	0.000009	0.000010	0.031	n/a	0.032	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00739	0.0111	0.015	n/a	0.022	n/a	0.00253	0.0036	0.005	n/a	0.007	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00570	0.00887	0.011	n/a	0.018	n/a	0.00224	0.00315	0.004	n/a	0.006	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0126	0.0163	0.253	n/a	0.163	n/a	0.0079	0.0090	0.158	n/a	0.090	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0110	0.0141	0.220	n/a	0.141	n/a	0.0076	0.0085	0.152	n/a	0.085	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0346	0.0470	0.099	n/a	0.134	n/a	0.0184	0.022	0.052	n/a	0.063	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.029	0.040	0.083	n/a	0.113	n/a	0.0174	0.0204	0.050	n/a	0.058	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D2. Brucejack Lake Outlet Hazard Quotients, High K (Upper Case)

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00241	0.002	n/a	0.002	n/a	0.353	0.492	0.35	n/a	0.49	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.304	0.436	0.30	n/a	0.44	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.03	0.01	n/a	0.003	n/a	16.5	20.5	0.11	n/a	0.03	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.01	n/a	0.003	n/a	14.5	18.1	0.10	n/a	0.03	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0879	0.0889	0.01	n/a	0.01	n/a	0.506	0.776	0.05	n/a	0.08	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0884	0.0889	0.01	n/a	0.01	n/a	0.446	0.490	0.04	n/a	0.05	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.0002	n/a	0.0002	n/a	0.00888	0.0110	0.001	n/a	0.001	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.0002	n/a	0.0002	n/a	0.00790	0.00971	0.001	n/a	0.001	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	15.7	16.5	0.12	n/a	0.13	n/a	46.6	55.8	0.36	n/a	0.44	n/a
High Flow	-	-	128	-	26.3	33.0	15.9	16.3	0.12	n/a	0.13	n/a	42.2	50.6	0.33	n/a	0.40	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0178	0.0207	0.04	n/a	0.04	n/a	0.0414	0.0513	0.08	n/a	0.10	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0181	0.0199	0.04	n/a	0.04	n/a	0.0377	0.0466	0.08	n/a	0.09	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00321	0.00401	0.01	n/a	0.01	n/a	0.00680	0.00802	0.01	n/a	0.02	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00329	0.00378	0.01	n/a	0.01	n/a	0.00615	0.00730	0.01	n/a	0.01	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000037	0.000046	0.004	n/a	0.005	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000033	0.000040	0.003	n/a	0.004	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00106	0.00152	0.02	n/a	0.03	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00092	0.00134	0.02	n/a	0.03	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.0001	n/a	0.0001	n/a	0.00041	0.00060	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.0001	n/a	0.0001	n/a	0.00036	0.00053	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00124	0.00231	0.00	n/a	0.01	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00112	0.00211	0.00	n/a	0.01	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0174	0.0175	0.06	n/a	0.06	n/a	0.0839	0.110	0.28	n/a	0.37	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.06	n/a	0.06	n/a	0.0749	0.0985	0.25	n/a	0.33	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00010	0.00014	0.00	n/a	0.00	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00009	0.00012	0.00	n/a	0.00	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D2. Brucejack Lake Outlet Hazard Quotients, High K (Upper Case)

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.00299	0.00378	0.004	n/a	0.005	n/a	0.0950	0.139	0.14	n/a	0.18	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.00310	0.00356	0.004	n/a	0.004	n/a	0.0821	0.122	0.11	n/a	0.14	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000008	0.000013	0.002	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000013	0.002	n/a	0.003	n/a	0.000007	0.000012	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00077	0.00087	0.00	n/a	0.00	n/a	0.00520	0.0066	0.01	n/a	0.01	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00078	0.00084	0.00	n/a	0.00	n/a	0.00457	0.00593	0.01	n/a	0.01	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.00	n/a	0.00	n/a	0.00082	0.00099	0.00	n/a	0.00	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.00	n/a	0.00	n/a	0.00074	0.00090	0.00	n/a	0.00	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00037	0.01	n/a	0.01	n/a	0.00068	0.00080	0.01	n/a	0.02	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00035	0.01	n/a	0.01	n/a	0.00062	0.00074	0.01	n/a	0.01	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000059	0.00	n/a	0.00	n/a	0.00002	0.00003	0.00	n/a	0.00	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.00	n/a	0.00	n/a	0.00002	0.00002	0.00	n/a	0.00	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000015	0.04	n/a	0.05	n/a	0.000024	0.000028	0.08	n/a	0.09	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.04	n/a	0.05	n/a	0.000022	0.000026	0.07	n/a	0.09	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00151	0.00	n/a	0.00	n/a	0.00790	0.0287	0.02	n/a	0.06	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00148	0.00151	0.00	n/a	0.00	n/a	0.00724	0.0250	0.01	n/a	0.05	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0105	0.0138	0.21	n/a	0.14	n/a	0.0344	0.0443	0.69	n/a	0.44	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0109	0.0128	0.22	n/a	0.13	n/a	0.0306	0.0395	0.61	n/a	0.40	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0146	0.04	n/a	0.04	n/a	0.0810	0.107	0.23	n/a	0.31	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.04	n/a	0.04	n/a	0.0720	0.0956	0.21	n/a	0.27	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

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Table 13-D2. Brucejack Lake Outlet Hazard Quotients, High K (Upper Case)

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.124	0.201	0.12	n/a	0.20	n/a	0.0230	0.0463	0.02	n/a	0.05	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0892	0.155	0.09	n/a	0.15	n/a	0.0171	0.0360	0.02	n/a	0.04	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	11.4	17.3	0.08	n/a	0.03	n/a	3.73	5.50	0.02	n/a	0.01	n/a
High Flow	-	-	150	600	0.393	1.00	8.74	13.7	0.06	n/a	0.02	n/a	3.27	4.72	0.02	n/a	0.01	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.137	0.166	0.01	n/a	0.02	n/a	0.0991	0.108	0.01	n/a	0.01	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.124	0.148	0.01	n/a	0.01	n/a	0.0969	0.104	0.01	n/a	0.01	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00572	0.00831	0.001	n/a	0.001	n/a	0.00233	0.00311	0.000	n/a	0.000	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00455	0.00676	0.000	n/a	0.001	n/a	0.00213	0.00277	0.000	n/a	0.000	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	34.9	47.4	0.27	n/a	0.37	n/a	18.7	22.4	0.15	n/a	0.18	n/a
High Flow	-	-	128	-	26.3	33.0	29.3	39.9	0.23	n/a	0.31	n/a	17.7	20.8	0.14	n/a	0.16	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0244	0.0305	0.05	n/a	0.06	n/a	0.0165	0.0183	0.03	n/a	0.04	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0217	0.0269	0.04	n/a	0.05	n/a	0.0160	0.0175	0.03	n/a	0.04	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00461	0.00563	0.01	n/a	0.01	n/a	0.00331	0.00366	0.01	n/a	0.01	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00404	0.00497	0.01	n/a	0.01	n/a	0.00311	0.00343	0.01	n/a	0.01	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000026	0.000039	0.003	n/a	0.004	n/a	0.000009	0.000013	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000020	0.000031	0.002	n/a	0.003	n/a	0.000008	0.000011	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00034	0.00051	0.01	n/a	0.01	n/a	0.00011	0.00016	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00026	0.00041	0.01	n/a	0.01	n/a	0.00009	0.00014	0.002	n/a	0.003	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00020	0.00030	0.0004	n/a	0.001	n/a	0.00008	0.00011	0.000	n/a	0.000	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00016	0.00024	0.0003	n/a	0.000	n/a	0.00007	0.00009	0.000	n/a	0.000	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00150	0.00227	0.0050	n/a	0.01	n/a	0.00048	0.00071	0.002	n/a	0.002	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.0005	0.00114	0.00181	0.0038	n/a	0.01	n/a	0.00042	0.00061	0.001	n/a	0.002	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0505	0.0709	0.17	n/a	0.24	n/a	0.0239	0.0300	0.08	n/a	0.10	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0412	0.0586	0.14	n/a	0.20	n/a	0.0222	0.0273	0.07	n/a	0.09	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00008	0.00012	0.000	n/a	0.001	n/a	0.00004	0.00005	0.0002	n/a	0.0002	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00007	0.00010	0.000	n/a	0.000	n/a	0.00004	0.0000	0.0002	n/a	0.0002	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D2. Brucejack Lake Outlet Hazard Quotients, High K (Upper Case)

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0449	0.0717	0.06	n/a	0.09	n/a	0.00978	0.0179	0.01	n/a	0.02	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0327	0.0555	0.04	n/a	0.06	n/a	0.00766	0.0143	0.01	n/a	0.02	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000006	0.000006	0.00	n/a	0.00	n/a	0.000005	0.000005	0.00	n/a	0.00	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000006	0.000006	0.00	n/a	0.00	n/a	0.000005	0.000005	0.00	n/a	0.00	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00209	0.00280	0.00	n/a	0.01	n/a	0.00116	0.00138	0.002	n/a	0.003	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00172	0.00236	0.00	n/a	0.00	n/a	0.00106	0.00126	0.002	n/a	0.003	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00054	0.00072	0.001	n/a	0.001	n/a	0.00030	0.00036	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00046	0.00061	0.001	n/a	0.001	n/a	0.00029	0.00033	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00042	0.00052	0.01	n/a	0.01	n/a	0.00030	0.00033	0.01	n/a	0.01	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00038	0.00046	0.01	n/a	0.01	n/a	0.00029	0.00031	0.01	n/a	0.01	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.0002	n/a	0.0002	n/a	0.00001	0.00001	0.00	n/a	0.00	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.0001	n/a	0.0002	n/a	0.00001	0.00001	0.00	n/a	0.00	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000014	0.000018	0.05	n/a	0.06	n/a	0.000010	0.000011	0.03	n/a	0.04	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000016	0.04	n/a	0.05	n/a	0.000010	0.000011	0.03	n/a	0.04	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.0180	0.0285	0.04	n/a	0.06	n/a	0.00432	0.00748	0.01	n/a	0.01	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.0133	0.0222	0.03	n/a	0.04	n/a	0.00352	0.00608	0.01	n/a	0.01	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0168	0.0232	0.34	n/a	0.23	n/a	0.00859	0.0105	0.17	n/a	0.10	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0140	0.0194	0.28	n/a	0.19	n/a	0.00810	0.00966	0.16	n/a	0.10	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0473	0.0679	0.14	n/a	0.19	n/a	0.0205	0.0267	0.06	n/a	0.08	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0381	0.0555	0.11	n/a	0.16	n/a	0.0189	0.0240	0.05	n/a	0.07	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D3. Brucejack Lake Outlet Hazard Quotients, Low K

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00241	0.002	n/a	0.002	n/a	0.205	0.254	0.205	n/a	0.254	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.177	0.224	0.177	n/a	0.224	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.03	0.013	n/a	0.003	n/a	4.08	4.99	0.027	n/a	0.008	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	3.81	4.62	0.025	n/a	0.008	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0879	0.0889	0.009	n/a	0.009	n/a	0.171	0.222	0.017	n/a	0.022	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0884	0.0889	0.009	n/a	0.009	n/a	0.160	0.163	0.016	n/a	0.016	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.0002	n/a	0.0002	n/a	0.00404	0.00461	0.0004	n/a	0.0005	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.0002	n/a	0.0002	n/a	0.00373	0.00426	0.0004	n/a	0.0004	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	15.7	16.5	0.123	n/a	0.129	n/a	24.4	27.5	0.2	n/a	0.2	n/a
High Flow	-	-	128	-	26.3	33.0	15.9	16.3	0.124	n/a	0.128	n/a	23.1	26.0	0.2	n/a	0.2	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0178	0.0207	0.036	n/a	0.041	n/a	0.0262	0.0303	0.052	n/a	0.061	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0181	0.0199	0.036	n/a	0.040	n/a	0.0246	0.0285	0.049	n/a	0.057	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00321	0.00401	0.006	n/a	0.008	n/a	0.00502	0.00584	0.010	n/a	0.012	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00329	0.00378	0.007	n/a	0.008	n/a	0.00460	0.00541	0.009	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000013	0.000016	0.001	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000012	0.000015	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00050	0.00065	0.010	n/a	0.013	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00044	0.00058	0.009	n/a	0.012	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00029	0.00040	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00026	0.00036	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00073	0.00086	0.002	n/a	0.003	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00067	0.00080	0.002	n/a	0.003	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0740	0.0903	0.247	n/a	0.301	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0664	0.0815	0.221	n/a	0.272	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00006	0.00007	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00005	0.00006	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D3. Brucejack Lake Outlet Hazard Quotients, Low K

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.00299	0.00378	0.004	n/a	0.005	n/a	0.0583	0.0828	0.083	n/a	0.106	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.00310	0.00356	0.004	n/a	0.004	n/a	0.0508	0.0735	0.069	n/a	0.085	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000013	0.002	n/a	0.003	n/a	0.000006	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00077	0.00087	0.002	n/a	0.002	n/a	0.00429	0.00563	0.009	n/a	0.011	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00078	0.00084	0.002	n/a	0.002	n/a	0.00379	0.00503	0.008	n/a	0.010	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.00061	0.00072	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.00056	0.00067	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00037	0.006	n/a	0.007	n/a	0.00055	0.00067	0.011	n/a	0.013	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00035	0.007	n/a	0.007	n/a	0.00051	0.00062	0.010	n/a	0.012	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000059	0.0001	n/a	0.0001	n/a	0.00002	0.00002	0.0004	n/a	0.0005	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.0001	n/a	0.0001	n/a	0.00002	0.00002	0.0003	n/a	0.0004	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000015	0.042	n/a	0.050	n/a	0.000018	0.000022	0.061	n/a	0.074	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.042	n/a	0.048	n/a	0.000017	0.000021	0.057	n/a	0.069	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00151	0.003	n/a	0.003	n/a	0.00487	0.00671	0.010	n/a	0.013	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00148	0.00151	0.003	n/a	0.003	n/a	0.00445	0.00616	0.009	n/a	0.012	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0105	0.0138	0.2	n/a	0.1	n/a	0.0191	0.0234	0.4	n/a	0.234	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0109	0.0128	0.2	n/a	0.1	n/a	0.0174	0.0214	0.3	n/a	0.214	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0711	0.0874	0.2	n/a	0.250	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0634	0.0786	0.2	n/a	0.225	n/a

Notes:

- guideline not available

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Table 13-D3. Brucejack Lake Outlet Hazard Quotients, Low K

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.112	0.181	0.112	n/a	0.181	n/a	0.0209	0.0419	0.021	n/a	0.042	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0804	0.139	0.080	n/a	0.139	n/a	0.0156	0.0326	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	3.38	4.15	0.023	n/a	0.007	n/a	2.4	2.6	0.016	n/a	0.004	n/a
High Flow	-	-	150	600	0.393	1.00	3.02	3.68	0.020	n/a	0.006	n/a	2.3	2.5	0.015	n/a	0.004	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.109	0.120	0.011	n/a	0.012	n/a	0.094	0.098	0.009	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.104	0.114	0.010	n/a	0.011	n/a	0.094	0.096	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00294	0.00376	0.0003	n/a	0.0004	n/a	0.00186	0.00211	0.0002	n/a	0.0002	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00257	0.00326	0.0003	n/a	0.0003	n/a	0.00180	0.00200	0.0002	n/a	0.0002	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	18.6	20.7	0.146	n/a	0.162	n/a	15.9	16.6	0.125	n/a	0.129	n/a
High Flow	-	-	128	-	26.3	33.0	17.7	19.5	0.138	n/a	0.152	n/a	15.8	16.3	0.123	n/a	0.127	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0182	0.0203	0.036	n/a	0.041	n/a	0.0154	0.0160	0.031	n/a	0.032	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0172	0.0190	0.034	n/a	0.038	n/a	0.0152	0.0158	0.030	n/a	0.032	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00337	0.00364	0.007	n/a	0.007	n/a	0.00310	0.00322	0.006	n/a	0.006	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00315	0.00341	0.006	n/a	0.007	n/a	0.00296	0.00308	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000009	0.000011	0.001	n/a	0.001	n/a	0.000006	0.000007	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000008	0.000010	0.001	n/a	0.001	n/a	0.000006	0.000006	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00021	0.00030	0.004	n/a	0.006	n/a	0.00009	0.00011	0.002	n/a	0.002	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00017	0.00024	0.003	n/a	0.005	n/a	0.00008	0.00010	0.002	n/a	0.002	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00013	0.00017	0.0003	n/a	0.0003	n/a	0.00006	0.00008	0.0001	n/a	0.0002	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00011	0.00015	0.0002	n/a	0.0003	n/a	0.00006	0.00007	0.0001	n/a	0.0001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00053	0.00069	0.002	n/a	0.002	n/a	0.00031	0.00036	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.0005	0.00045	0.00059	0.002	n/a	0.002	n/a	0.00030	0.00034	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.034	0.044	0.113	n/a	0.146	n/a	0.0211	0.024	0.070	n/a	0.080	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.029	0.038	0.098	n/a	0.126	n/a	0.0202	0.0227	0.067	n/a	0.076	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00004	0.00005	0.000	n/a	0.000	n/a	0.00003	0.00003	0.0002	n/a	0.0002	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00004	0.00004	0.000	n/a	0.000	n/a	0.00003	0.0000	0.0002	n/a	0.0002	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D3. Brucejack Lake Outlet Hazard Quotients, Low K

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.021	0.03	0.030	n/a	0.042	n/a	0.006	0.009	0.008	n/a	0.012	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.016	0.03	0.021	n/a	0.030	n/a	0.005	0.008	0.007	n/a	0.009	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00159	0.00198	0.003	n/a	0.004	n/a	0.00107	0.00121	0.002	n/a	0.002	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00136	0.00173	0.003	n/a	0.003	n/a	0.00100	0.00112	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.0003	0.0004	0.001	n/a	0.001	n/a	0.00027	0.00028	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00032	0.0004	0.001	n/a	0.001	n/a	0.00026	0.00028	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00035	0.006	n/a	0.007	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00031	0.00033	0.006	n/a	0.007	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.0001	n/a	0.0002	n/a	0.00001	0.00001	0.0001	n/a	0.0001	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.0001	n/a	0.0002	n/a	0.00001	0.00001	0.0001	n/a	0.0001	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000011	0.000012	0.035	n/a	0.038	n/a	0.000009	0.000010	0.031	n/a	0.032	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000010	0.000011	0.034	n/a	0.037	n/a	0.000009	0.000009	0.031	n/a	0.032	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00453	0.00643	0.009	n/a	0.013	n/a	0.00205	0.0026	0.004	n/a	0.005	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00367	0.00529	0.007	n/a	0.011	n/a	0.00190	0.00236	0.004	n/a	0.005	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0106	0.0129	0.212	n/a	0.129	n/a	0.0075	0.0082	0.151	n/a	0.082	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.00953	0.0115	0.191	n/a	0.115	n/a	0.0073	0.0079	0.147	n/a	0.079	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0308	0.0408	0.088	n/a	0.116	n/a	0.0177	0.021	0.051	n/a	0.059	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0262	0.0347	0.075	n/a	0.099	n/a	0.0169	0.0194	0.048	n/a	0.055	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D4. Brucejack Lake Outlet Hazard Quotients, 100 Year Wet

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00241	0.002	n/a	0.002	n/a	0.230	0.295	0.230	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00241	0.00242	0.002	n/a	0.002	n/a	0.199	0.260	0.199	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.04	0.013	n/a	0.003	n/a	6.36	7.54	0.042	n/a	0.013	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.04	0.013	n/a	0.003	n/a	5.76	6.88	0.038	n/a	0.011	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0880	0.0891	0.009	n/a	0.009	n/a	0.231	0.318	0.023	n/a	0.032	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0884	0.0892	0.009	n/a	0.009	n/a	0.211	0.222	0.021	n/a	0.022	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.0002	n/a	0.0002	n/a	0.00491	0.00579	0.0005	n/a	0.0006	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.0002	n/a	0.0002	n/a	0.00449	0.00523	0.0004	n/a	0.0005	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	15.7	16.4	0.123	n/a	0.128	n/a	28.4	32.0	0.222	n/a	0.250	n/a
High Flow	-	-	128	-	26.3	33.0	15.8	16.3	0.124	n/a	0.127	n/a	26.6	30.0	0.208	n/a	0.234	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0177	0.0203	0.035	n/a	0.041	n/a	0.0305	0.0352	0.061	n/a	0.070	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0179	0.0199	0.036	n/a	0.040	n/a	0.0282	0.0327	0.056	n/a	0.065	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00319	0.00389	0.006	n/a	0.008	n/a	0.00530	0.00618	0.011	n/a	0.012	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00324	0.00376	0.006	n/a	0.008	n/a	0.00485	0.00568	0.010	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000017	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00068	0.00085	0.014	n/a	0.017	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00059	0.00076	0.012	n/a	0.015	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00032	0.00046	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00028	0.00041	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00092	0.00115	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00083	0.00105	0.003	n/a	0.003	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0777	0.101	0.259	n/a	0.338	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0695	0.0909	0.232	n/a	0.303	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00007	0.00008	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00006	0.00008	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D4. Brucejack Lake Outlet Hazard Quotients, 100 Year Wet

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.00297	0.00366	0.004	n/a	0.005	n/a	0.0671	0.0996	0.096	n/a	0.128	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.00307	0.00351	0.004	n/a	0.004	n/a	0.0582	0.0877	0.079	n/a	0.102	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000012	0.001	n/a	0.002	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000013	0.002	n/a	0.003	n/a	0.000006	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00076	0.00086	0.002	n/a	0.002	n/a	0.00455	0.00586	0.009	n/a	0.012	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00078	0.00083	0.002	n/a	0.002	n/a	0.00401	0.00524	0.008	n/a	0.010	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0006	0.0008	0.001	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0006	0.0007	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00036	0.006	n/a	0.007	n/a	0.00057	0.00068	0.011	n/a	0.014	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00035	0.007	n/a	0.007	n/a	0.00053	0.00063	0.011	n/a	0.013	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000058	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000015	0.041	n/a	0.049	n/a	0.000019	0.000023	0.064	n/a	0.076	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.042	n/a	0.047	n/a	0.000018	0.000021	0.059	n/a	0.071	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00151	0.003	n/a	0.003	n/a	0.00555	0.0109	0.011	n/a	0.022	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00148	0.00150	0.003	n/a	0.003	n/a	0.00507	0.0100	0.010	n/a	0.020	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0104	0.0132	0.208	n/a	0.132	n/a	0.0235	0.0283	0.469	n/a	0.283	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0108	0.0127	0.215	n/a	0.127	n/a	0.0211	0.0258	0.422	n/a	0.258	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0748	0.0984	0.214	n/a	0.281	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0666	0.0880	0.190	n/a	0.251	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D4. Brucejack Lake Outlet Hazard Quotients, 100 Year Wet

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.102	0.166	0.102	n/a	0.166	n/a	0.0194	0.0385	0.019	n/a	0.039	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0737	0.128	0.074	n/a	0.128	n/a	0.0145	0.0300	0.015	n/a	0.030	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	4.69	6.29	0.031	n/a	0.010	n/a	2.60	3.08	0.017	n/a	0.005	n/a
High Flow	-	-	150	600	0.393	1.00	3.96	5.32	0.026	n/a	0.009	n/a	2.47	2.87	0.016	n/a	0.005	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.112	0.125	0.011	n/a	0.013	n/a	0.0949	0.0988	0.009	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.106	0.117	0.011	n/a	0.012	n/a	0.0939	0.0971	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00329	0.00434	0.0003	n/a	0.0004	n/a	0.00192	0.00224	0.0002	n/a	0.0002	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00282	0.00371	0.0003	n/a	0.0004	n/a	0.00184	0.00210	0.0002	n/a	0.0002	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	21.3	25.0	0.166	n/a	0.195	n/a	16.4	17.5	0.128	n/a	0.137	n/a
High Flow	-	-	128	-	26.3	33.0	19.6	22.7	0.153	n/a	0.178	n/a	16.1	17.0	0.126	n/a	0.133	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0197	0.0227	0.039	n/a	0.045	n/a	0.0157	0.0166	0.031	n/a	0.033	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0183	0.0209	0.037	n/a	0.042	n/a	0.0154	0.0162	0.031	n/a	0.032	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00351	0.00386	0.007	n/a	0.008	n/a	0.00312	0.00327	0.006	n/a	0.007	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00325	0.00359	0.006	n/a	0.007	n/a	0.00297	0.00312	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000012	0.000016	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000010	0.000014	0.001	n/a	0.001	n/a	0.000006	0.000007	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00025	0.00036	0.005	n/a	0.007	n/a	0.00009	0.00013	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00019	0.00029	0.004	n/a	0.006	n/a	0.00008	0.00011	0.002	n/a	0.002	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00013	0.00019	0.000	n/a	0.000	n/a	0.00007	0.00008	0.000	n/a	0.000	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00011	0.00015	0.000	n/a	0.000	n/a	0.00006	0.00007	0.000	n/a	0.000	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00070	0.00097	0.002	n/a	0.003	n/a	0.00034	0.00042	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.0005	0.00057	0.00080	0.002	n/a	0.003	n/a	0.00032	0.00039	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0355	0.0463	0.118	n/a	0.154	n/a	0.0213	0.0246	0.071	n/a	0.082	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0305	0.0398	0.102	n/a	0.133	n/a	0.0204	0.0231	0.068	n/a	0.077	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00005	0.00006	0.000	n/a	0.000	n/a	0.00003	0.00004	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00004	0.00005	0.000	n/a	0.000	n/a	0.00003	0.00004	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D4. Brucejack Lake Outlet Hazard Quotients, 100 Year Wet

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0235	0.0367	0.034	n/a	0.047	n/a	0.00617	0.0102	0.009	n/a	0.013	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0174	0.0288	0.024	n/a	0.033	n/a	0.00509	0.00838	0.007	n/a	0.010	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00160	0.00201	0.003	n/a	0.004	n/a	0.00107	0.00121	0.002	n/a	0.002	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00137	0.00175	0.003	n/a	0.003	n/a	0.00100	0.00112	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00037	0.00044	0.001	n/a	0.001	n/a	0.00027	0.00029	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00033	0.00040	0.001	n/a	0.001	n/a	0.00027	0.00028	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00034	0.00038	0.007	n/a	0.008	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00032	0.00035	0.006	n/a	0.007	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000011	0.000012	0.037	n/a	0.041	n/a	0.000009	0.000010	0.031	n/a	0.033	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000011	0.000012	0.035	n/a	0.039	n/a	0.000009	0.000010	0.031	n/a	0.032	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00686	0.0102	0.014	n/a	0.020	n/a	0.00244	0.0035	0.005	n/a	0.007	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00533	0.00821	0.011	n/a	0.016	n/a	0.00218	0.00301	0.004	n/a	0.006	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0120	0.0153	0.241	n/a	0.153	n/a	0.00778	0.00875	0.156	n/a	0.088	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0106	0.0134	0.211	n/a	0.134	n/a	0.00752	0.00834	0.150	n/a	0.083	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0323	0.0433	0.092	n/a	0.124	n/a	0.0180	0.0213	0.051	n/a	0.061	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0274	0.0367	0.078	n/a	0.105	n/a	0.0171	0.0198	0.049	n/a	0.057	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D5. Brucejack Lake Outlet Hazard Quotients, 100 Year Year

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00239	0.00240	0.002	n/a	0.002	n/a	0.231	0.295	0.231	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.200	0.260	0.200	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	3.53	23.28	0.024	n/a	0.039	n/a	6.38	7.60	0.043	n/a	0.013	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	5.80	6.94	0.039	n/a	0.012	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.094	0.176	0.009	n/a	0.018	n/a	0.232	0.318	0.023	n/a	0.032	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.088	0.089	0.009	n/a	0.009	n/a	0.211	0.222	0.021	n/a	0.022	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.000157	n/a	0.000158	n/a	0.0049	0.0058	0.000493	n/a	0.000579	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.000158	n/a	0.000158	n/a	0.00451	0.00523	0.000451	n/a	0.000523	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	16.4	24.7	0.128	n/a	0.193	n/a	28.5	32.0	0.222	n/a	0.250	n/a
High Flow	-	-	128	-	26.3	33.0	16.0	16.5	0.125	n/a	0.129	n/a	26.7	30.0	0.208	n/a	0.234	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0194	0.0374	0.039	n/a	0.075	n/a	0.0306	0.0352	0.061	n/a	0.070	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0186	0.0210	0.037	n/a	0.042	n/a	0.0284	0.0327	0.057	n/a	0.065	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00353	0.00683	0.007	n/a	0.014	n/a	0.0053	0.0062	0.011	n/a	0.012	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00343	0.00409	0.007	n/a	0.008	n/a	0.0049	0.0057	0.010	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000006	0.000017	0.001	n/a	0.002	n/a	0.000018	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000006	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00007	0.00011	0.001	n/a	0.002	n/a	0.00068	0.00085	0.014	n/a	0.017	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00060	0.00076	0.012	n/a	0.015	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00007	0.00029	0.000	n/a	0.001	n/a	0.00032	0.00046	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00029	0.00041	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00028	0.00031	0.001	n/a	0.001	n/a	0.00092	0.00115	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00084	0.00105	0.003	n/a	0.003	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0184	0.0314	0.061	n/a	0.105	n/a	0.0779	0.101	0.260	n/a	0.338	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0174	0.058	n/a	0.058	n/a	0.0697	0.0909	0.232	n/a	0.303	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00004	0.000	n/a	0.000	n/a	0.00007	0.00008	0.0003	n/a	0.0004	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00006	0.00008	0.0003	n/a	0.0004	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D5. Brucejack Lake Outlet Hazard Quotients, 100 Year Year

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.00375	0.0130	0.005	n/a	0.017	n/a	0.0673	0.100	0.096	n/a	0.128	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.00324	0.00383	0.005	n/a	0.004	n/a	0.0585	0.0877	0.084	n/a	0.102	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000016	0.002	n/a	0.003	n/a	0.000007	0.000014	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000012	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00085	0.00192	0.002	n/a	0.004	n/a	0.00457	0.0059	0.009	n/a	0.012	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00080	0.00088	0.002	n/a	0.002	n/a	0.00403	0.00524	0.008	n/a	0.010	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00028	0.00051	0.001	n/a	0.001	n/a	0.0006	0.0008	0.001	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0006	0.0007	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00036	0.00080	0.007	n/a	0.016	n/a	0.00057	0.00068	0.011	n/a	0.014	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00037	0.007	n/a	0.007	n/a	0.00053	0.00063	0.011	n/a	0.013	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000056	0.0000068	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000056	0.0000059	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000015	0.000039	0.049	n/a	0.131	n/a	0.000019	0.000023	0.064	n/a	0.076	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000015	0.044	n/a	0.051	n/a	0.000018	0.000021	0.059	n/a	0.071	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00150	0.00174	0.003	n/a	0.003	n/a	0.0056	0.0122	0.011	n/a	0.024	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00149	0.00151	0.003	n/a	0.003	n/a	0.0051	0.0110	0.010	n/a	0.022	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0114	0.0195	0.227	n/a	0.195	n/a	0.0236	0.0283	0.472	n/a	0.283	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0115	0.0140	0.230	n/a	0.140	n/a	0.0213	0.0258	0.425	n/a	0.258	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0152	0.041	n/a	0.043	n/a	0.0750	0.0984	0.214	n/a	0.281	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.041	n/a	0.042	n/a	0.0668	0.0880	0.191	n/a	0.251	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D5. Brucejack Lake Outlet Hazard Quotients, 100 Year Year

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.130	0.211	0.130	n/a	0.211	n/a	0.0240	0.0484	0.024	n/a	0.048	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0933	0.162	0.093	n/a	0.162	n/a	0.0178	0.0376	0.018	n/a	0.038	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	5.36	7.39	0.036	n/a	0.012	n/a	2.72	3.32	0.018	n/a	0.006	n/a
High Flow	-	-	150	600	0.393	1.00	4.44	6.17	0.030	n/a	0.010	n/a	2.55	3.05	0.017	n/a	0.005	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.118	0.135	0.012	n/a	0.013	n/a	0.0959	0.101	0.010	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.110	0.125	0.011	n/a	0.012	n/a	0.0946	0.0987	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00375	0.00510	0.000375	n/a	0.000510	n/a	0.00200	0.00240	0.0002	n/a	0.0002	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00315	0.00429	0.000315	n/a	0.000429	n/a	0.00190	0.00223	0.0002	n/a	0.0002	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	22.8	27.5	0.178	n/a	0.215	n/a	16.7	18.1	0.130	n/a	0.141	n/a
High Flow	-	-	128	-	26.3	33.0	20.7	24.7	0.161	n/a	0.193	n/a	16.3	17.4	0.127	n/a	0.136	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0210	0.0249	0.042	n/a	0.050	n/a	0.0159	0.0171	0.032	n/a	0.034	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0192	0.0226	0.038	n/a	0.045	n/a	0.0156	0.0166	0.031	n/a	0.033	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00377	0.00428	0.008	n/a	0.009	n/a	0.00316	0.00336	0.006	n/a	0.007	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00344	0.00391	0.007	n/a	0.008	n/a	0.00301	0.00320	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000013	0.000018	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000011	0.000015	0.001	n/a	0.002	n/a	0.000006	0.000008	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00030	0.00046	0.006	n/a	0.009	n/a	0.00010	0.00015	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00023	0.00037	0.005	n/a	0.007	n/a	0.00009	0.00013	0.002	n/a	0.003	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00016	0.00023	0.0003	n/a	0.0005	n/a	0.00007	0.00009	0.0001	n/a	0.0002	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00013	0.00019	0.0003	n/a	0.0004	n/a	0.00006	0.00008	0.0001	n/a	0.0002	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00078	0.00110	0.003	n/a	0.004	n/a	0.00036	0.00045	0.001	n/a	0.002	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.0005	0.00063	0.00091	0.002	n/a	0.003	n/a	0.00033	0.00041	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0408	0.0550	0.136	n/a	0.183	n/a	0.0222	0.026	0.074	n/a	0.088	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0343	0.0465	0.114	n/a	0.155	n/a	0.0211	0.0246	0.070	n/a	0.082	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00005	0.00007	0.0003	n/a	0.000	n/a	0.00003	0.00004	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00005	0.00006	0.0002	n/a	0.000	n/a	0.00003	0.0000	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D5. Brucejack Lake Outlet Hazard Quotients, 100 Year Year

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0300	0.0473	0.043	n/a	0.061	n/a	0.0073	0.0125	0.010	n/a	0.016	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0221	0.0369	0.031	n/a	0.043	n/a	0.0059	0.0102	0.008	n/a	0.012	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00184	0.00240	0.004	n/a	0.005	n/a	0.00111	0.00130	0.002	n/a	0.003	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00155	0.00205	0.003	n/a	0.004	n/a	0.00103	0.00119	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.0004	0.0005	0.001	n/a	0.001	n/a	0.00028	0.00031	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00036	0.0004	0.001	n/a	0.001	n/a	0.00027	0.00029	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00035	0.00040	0.007	n/a	0.008	n/a	0.00028	0.00030	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00037	0.007	n/a	0.007	n/a	0.00028	0.00029	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000013	0.039	n/a	0.044	n/a	0.000010	0.000010	0.032	n/a	0.033	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000011	0.000012	0.036	n/a	0.041	n/a	0.000009	0.000010	0.031	n/a	0.033	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.0080	0.0121	0.016	n/a	0.024	n/a	0.00263	0.0039	0.005	n/a	0.008	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.0062	0.0097	0.012	n/a	0.019	n/a	0.00231	0.00333	0.005	n/a	0.007	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0135	0.0176	0.270	n/a	0.176	n/a	0.0080	0.0093	0.160	n/a	0.093	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0116	0.0152	0.232	n/a	0.152	n/a	0.0077	0.0087	0.154	n/a	0.087	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0377	0.0520	0.108	n/a	0.149	n/a	0.0189	0.023	0.054	n/a	0.066	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0312	0.0434	0.089	n/a	0.124	n/a	0.0178	0.0213	0.051	n/a	0.061	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D6. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Lag

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00241	0.002	n/a	0.002	n/a	0.231	0.295	0.231	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.199	0.260	0.199	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.03	0.013	n/a	0.003	n/a	29.7	47.6	0.198	n/a	0.079	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	25.8	41.9	0.172	n/a	0.070	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.088	0.089	0.009	n/a	0.009	n/a	0.232	0.318	0.023	n/a	0.032	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.088	0.089	0.009	n/a	0.009	n/a	0.211	0.223	0.021	n/a	0.022	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.000157	n/a	0.000158	n/a	0.00492	0.00579	0.000492	n/a	0.000579	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.000158	n/a	0.000158	n/a	0.00450	0.00523	0.000450	n/a	0.000523	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	15.7	16.5	0.123	n/a	0.129	n/a	57.5	77.5	0.449	n/a	0.606	n/a
High Flow	-	-	128	-	26.3	33.0	15.9	16.3	0.124	n/a	0.128	n/a	51.6	69.4	0.403	n/a	0.542	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0178	0.0207	0.036	n/a	0.041	n/a	0.0306	0.0352	0.061	n/a	0.070	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0181	0.0199	0.036	n/a	0.040	n/a	0.0284	0.0328	0.057	n/a	0.066	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00321	0.00401	0.006	n/a	0.008	n/a	0.0053	0.0062	0.011	n/a	0.012	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00329	0.00378	0.007	n/a	0.008	n/a	0.0049	0.0057	0.010	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000017	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00068	0.00085	0.014	n/a	0.017	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00060	0.00076	0.012	n/a	0.015	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00203	0.00272	0.004	n/a	0.005	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00179	0.00240	0.004	n/a	0.005	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00105	0.00125	0.004	n/a	0.004	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00095	0.00114	0.003	n/a	0.004	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0174	0.0175	0.058	n/a	0.058	n/a	0.136	0.169	0.453	n/a	0.565	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.058	n/a	0.058	n/a	0.121	0.152	0.404	n/a	0.507	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00114	0.00170	0.006	n/a	0.008	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00099	0.00149	0.005	n/a	0.007	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D6. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Lag

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							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0030	0.0038	0.004	n/a	0.005	n/a	0.401	0.538	0.572	n/a	0.690	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0031	0.0036	0.004	n/a	0.004	n/a	0.352	0.473	0.480	n/a	0.550	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000013	0.002	n/a	0.003	n/a	0.000007	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00077	0.00087	0.002	n/a	0.002	n/a	0.00440	0.0056	0.009	n/a	0.011	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00078	0.00084	0.002	n/a	0.002	n/a	0.00388	0.00504	0.008	n/a	0.010	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0054	0.0070	0.011	n/a	0.014	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0047	0.0062	0.009	n/a	0.012	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00032	0.00037	0.006	n/a	0.007	n/a	0.00063	0.00075	0.013	n/a	0.015	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00035	0.007	n/a	0.007	n/a	0.00058	0.00069	0.012	n/a	0.014	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000059	0.0001	n/a	0.0001	n/a	0.00002	0.00003	0.0005	n/a	0.001	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.0001	n/a	0.0001	n/a	0.00002	0.00003	0.0004	n/a	0.001	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000015	0.042	n/a	0.050	n/a	0.000021	0.000025	0.071	n/a	0.085	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.042	n/a	0.048	n/a	0.000019	0.000023	0.065	n/a	0.078	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00151	0.003	n/a	0.003	n/a	0.0115	0.0148	0.023	n/a	0.030	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00148	0.00151	0.003	n/a	0.003	n/a	0.0103	0.0132	0.021	n/a	0.026	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0105	0.0138	0.210	n/a	0.138	n/a	0.0236	0.0283	0.472	n/a	0.283	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0109	0.0128	0.218	n/a	0.128	n/a	0.0212	0.0258	0.425	n/a	0.258	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0146	0.041	n/a	0.042	n/a	0.133	0.167	0.380	n/a	0.476	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.041	n/a	0.042	n/a	0.118	0.149	0.338	n/a	0.426	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D6. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Lag

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.114	0.185	0.114	n/a	0.185	n/a	0.0213	0.0427	0.021	n/a	0.043	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.082	0.142	0.082	n/a	0.142	n/a	0.0159	0.0333	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	25.9	40.9	0.172	n/a	0.068	n/a	6.17	10.7	0.041	n/a	0.018	n/a
High Flow	-	-	150	600	0.393	1.00	19.0	31.9	0.127	n/a	0.053	n/a	5.01	8.70	0.033	n/a	0.015	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.115	0.129	0.011	n/a	0.013	n/a	0.0953	0.100	0.010	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.108	0.120	0.011	n/a	0.012	n/a	0.0942	0.0978	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00349	0.00467	0.000349	n/a	0.000467	n/a	0.00195	0.00231	0.000195	n/a	0.000231	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00296	0.00396	0.000296	n/a	0.000396	n/a	0.00187	0.00215	0.000187	n/a	0.000215	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	47.3	67.5	0.369	n/a	0.528	n/a	20.8	26.9	0.162	n/a	0.210	n/a
High Flow	-	-	128	-	26.3	33.0	38.1	55.3	0.298	n/a	0.432	n/a	19.2	24.2	0.150	n/a	0.189	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0217	0.0261	0.043	n/a	0.052	n/a	0.0160	0.0173	0.032	n/a	0.035	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0197	0.0235	0.039	n/a	0.047	n/a	0.0157	0.0168	0.031	n/a	0.034	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00362	0.00404	0.007	n/a	0.008	n/a	0.00314	0.00331	0.006	n/a	0.007	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00333	0.00373	0.007	n/a	0.007	n/a	0.00299	0.00315	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000012	0.000017	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000010	0.000014	0.001	n/a	0.001	n/a	0.000006	0.000007	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00031	0.00046	0.006	n/a	0.009	n/a	0.00010	0.00015	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00024	0.00037	0.005	n/a	0.007	n/a	0.00009	0.00013	0.002	n/a	0.003	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00148	0.00239	0.003	n/a	0.005	n/a	0.00029	0.00057	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00107	0.00184	0.002	n/a	0.004	n/a	0.00022	0.00044	0.000	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00077	0.00108	0.003	n/a	0.004	n/a	0.00035	0.00045	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00062	0.00089	0.002	n/a	0.003	n/a	0.00033	0.00041	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0915	0.138	0.305	n/a	0.460	n/a	0.0308	0.045	0.103	n/a	0.149	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0705	0.110	0.235	n/a	0.367	n/a	0.0272	0.0386	0.091	n/a	0.129	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00092	0.00149	0.005	n/a	0.007	n/a	0.00018	0.00035	0.001	n/a	0.002	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00066	0.00115	0.003	n/a	0.006	n/a	0.00014	0.0003	0.001	n/a	0.001	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D6. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Lag

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.289	0.470	0.412	n/a	0.604	n/a	0.051	0.106	0.073	n/a	0.136	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.206	0.361	0.282	n/a	0.419	n/a	0.037	0.081	0.050	n/a	0.095	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00157	0.00197	0.003	n/a	0.004	n/a	0.00107	0.00120	0.002	n/a	0.002	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00135	0.00171	0.003	n/a	0.003	n/a	0.00099	0.00112	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.0038	0.0061	0.008	n/a	0.012	n/a	0.00086	0.00155	0.002	n/a	0.003	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00281	0.0047	0.006	n/a	0.009	n/a	0.00068	0.00124	0.001	n/a	0.002	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00039	0.00047	0.008	n/a	0.009	n/a	0.00029	0.00031	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00036	0.00042	0.007	n/a	0.008	n/a	0.00029	0.00030	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00002	0.0002	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.0002	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000013	0.000016	0.043	n/a	0.052	n/a	0.000010	0.000010	0.032	n/a	0.035	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000012	0.000014	0.040	n/a	0.047	n/a	0.000010	0.000010	0.032	n/a	0.034	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.0086	0.0131	0.017	n/a	0.026	n/a	0.00273	0.0041	0.005	n/a	0.008	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.0066	0.0104	0.013	n/a	0.021	n/a	0.00239	0.00349	0.005	n/a	0.007	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0141	0.0187	0.283	n/a	0.187	n/a	0.0081	0.0095	0.163	n/a	0.095	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0121	0.0160	0.241	n/a	0.160	n/a	0.0078	0.0089	0.155	n/a	0.089	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.088	0.135	0.252	n/a	0.386	n/a	0.0274	0.041	0.078	n/a	0.119	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.067	0.107	0.192	n/a	0.305	n/a	0.0239	0.0353	0.068	n/a	0.101	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D7. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Concentrations

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00239	0.00240	0.002	n/a	0.002	n/a	0.231	0.295	0.231	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00241	0.002	n/a	0.002	n/a	0.199	0.260	0.199	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	3.53	23.3	0.024	n/a	0.039	n/a	9.36	11.5	0.062	n/a	0.019	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	8.35	10.3	0.056	n/a	0.017	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0940	0.176	0.009	n/a	0.018	n/a	0.231	0.318	0.023	n/a	0.032	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0883	0.0887	0.009	n/a	0.009	n/a	0.211	0.222	0.021	n/a	0.022	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.000157	n/a	0.000158	n/a	0.0049	0.0058	0.000492	n/a	0.000579	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.000158	n/a	0.000158	n/a	0.00450	0.00523	0.000450	n/a	0.000523	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	16.4	24.7	0.128	n/a	0.193	n/a	39.0	45.5	0.305	n/a	0.356	n/a
High Flow	-	-	128	-	26.3	33.0	15.9	16.4	0.124	n/a	0.128	n/a	35.8	41.7	0.280	n/a	0.326	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0193	0.0374	0.039	n/a	0.075	n/a	0.0306	0.0352	0.061	n/a	0.070	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0183	0.0203	0.037	n/a	0.041	n/a	0.0284	0.0328	0.057	n/a	0.066	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00350	0.00683	0.007	n/a	0.014	n/a	0.0053	0.0062	0.011	n/a	0.012	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00333	0.00386	0.007	n/a	0.008	n/a	0.0049	0.0057	0.010	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000006	0.000017	0.001	n/a	0.002	n/a	0.000017	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000006	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00007	0.00011	0.001	n/a	0.002	n/a	0.00068	0.00085	0.014	n/a	0.017	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00060	0.00076	0.012	n/a	0.015	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00007	0.00029	0.000	n/a	0.001	n/a	0.00041	0.00057	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00036	0.00050	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00028	0.00031	0.001	n/a	0.001	n/a	0.00100	0.00121	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.0005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00091	0.00110	0.003	n/a	0.004	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0184	0.0314	0.061	n/a	0.105	n/a	0.0796	0.103	0.265	n/a	0.345	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0174	0.0175	0.058	n/a	0.058	n/a	0.0712	0.0927	0.237	n/a	0.309	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00004	0.0001	n/a	0.0002	n/a	0.00009	0.00012	0.000	n/a	0.001	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.0001	n/a	0.0002	n/a	0.00008	0.00011	0.000	n/a	0.001	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D7. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Concentrations

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							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.00365	0.0130	0.005	n/a	0.017	n/a	0.0894	0.14	0.128	n/a	0.181	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.00302	0.0035	0.004	n/a	0.004	n/a	0.0779	0.12	0.106	n/a	0.145	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000016	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000013	0.002	n/a	0.003	n/a	0.000007	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00084	0.00192	0.002	n/a	0.004	n/a	0.00487	0.0063	0.010	n/a	0.013	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00077	0.00083	0.002	n/a	0.002	n/a	0.00429	0.00560	0.009	n/a	0.011	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00028	0.00051	0.001	n/a	0.001	n/a	0.0009	0.0011	0.002	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0008	0.0010	0.002	n/a	0.002	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00035	0.00080	0.007	n/a	0.016	n/a	0.00065	0.00078	0.013	n/a	0.016	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00032	0.00035	0.006	n/a	0.007	n/a	0.00059	0.00071	0.012	n/a	0.014	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000056	0.0000068	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000058	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000014	0.000039	0.048	n/a	0.131	n/a	0.000021	0.000025	0.070	n/a	0.084	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000013	0.000014	0.043	n/a	0.048	n/a	0.000019	0.000023	0.064	n/a	0.077	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00149	0.00174	0.003	n/a	0.003	n/a	0.0067	0.0118	0.013	n/a	0.024	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00149	0.00151	0.003	n/a	0.003	n/a	0.0060	0.0108	0.012	n/a	0.022	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0111	0.0195	0.223	n/a	0.195	n/a	0.0236	0.0283	0.471	n/a	0.283	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0109	0.0129	0.218	n/a	0.129	n/a	0.0212	0.0258	0.425	n/a	0.258	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0145	0.0152	0.041	n/a	0.043	n/a	0.077	0.100	0.219	n/a	0.287	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0146	0.042	n/a	0.042	n/a	0.068	0.090	0.195	n/a	0.257	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D7. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Concentrations

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.114	0.185	0.114	n/a	0.185	n/a	0.0214	0.0428	0.021	n/a	0.043	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0821	0.142	0.082	n/a	0.142	n/a	0.0159	0.0333	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	6.93	9.95	0.046	n/a	0.017	n/a	2.98	3.89	0.020	n/a	0.006	n/a
High Flow	-	-	150	600	0.393	1.00	5.55	8.13	0.037	n/a	0.014	n/a	2.74	3.48	0.018	n/a	0.006	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.115	0.129	0.011	n/a	0.013	n/a	0.0953	0.100	0.010	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.108	0.120	0.011	n/a	0.012	n/a	0.0942	0.0978	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00349	0.00467	0.000349	n/a	0.000467	n/a	0.00196	0.00231	0.000196	n/a	0.000231	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00296	0.00396	0.000296	n/a	0.000396	n/a	0.00187	0.00215	0.000187	n/a	0.000215	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	31.3	41.3	0.244	n/a	0.323	n/a	18.1	21.1	0.141	n/a	0.165	n/a
High Flow	-	-	128	-	26.3	33.0	26.7	35.3	0.209	n/a	0.276	n/a	17.3	19.8	0.135	n/a	0.155	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0218	0.0261	0.044	n/a	0.052	n/a	0.0162	0.0174	0.032	n/a	0.035	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0198	0.0235	0.040	n/a	0.047	n/a	0.0158	0.0169	0.032	n/a	0.034	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00363	0.00404	0.007	n/a	0.008	n/a	0.00316	0.00333	0.006	n/a	0.007	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00334	0.00373	0.007	n/a	0.007	n/a	0.00301	0.00318	0.006	n/a	0.006	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000013	0.000017	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000010	0.000014	0.001	n/a	0.001	n/a	0.000006	0.000007	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.000273	0.000407	0.005	n/a	0.008	n/a	0.00010	0.00014	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.000212	0.000326	0.004	n/a	0.007	n/a	0.00009	0.00012	0.002	n/a	0.002	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.000223	0.000333	0.000	n/a	0.001	n/a	0.00008	0.00011	0.000	n/a	0.000	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.000174	0.000267	0.000	n/a	0.001	n/a	0.00007	0.00010	0.000	n/a	0.000	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.000749	0.00105	0.002	n/a	0.004	n/a	0.00035	0.00044	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.0005	0.000612	0.000869	0.002	n/a	0.003	n/a	0.00033	0.00040	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0400	0.0527	0.133	n/a	0.176	n/a	0.0232	0.0271	0.077	n/a	0.090	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0339	0.0450	0.113	n/a	0.150	n/a	0.0220	0.0253	0.073	n/a	0.084	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.000080	0.000106	0.000	n/a	0.001	n/a	0.00005	0.00006	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.000067	0.000090	0.000	n/a	0.000	n/a	0.00004	0.0001	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D7. Brucejack Lake Outlet Hazard Quotients, Conservative Adit Concentrations

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0770	0.124	0.110	n/a	0.159	n/a	0.0153	0.0295	0.022	n/a	0.038	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0556	0.096	0.076	n/a	0.111	n/a	0.0116	0.0232	0.016	n/a	0.027	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00202	0.00269	0.004	n/a	0.005	n/a	0.00114	0.00136	0.002	n/a	0.003	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00167	0.00227	0.003	n/a	0.005	n/a	0.00105	0.00124	0.002	n/a	0.002	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.000597	0.000817	0.001	n/a	0.002	n/a	0.00031	0.00038	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.000498	0.000685	0.001	n/a	0.001	n/a	0.00029	0.00035	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.000408	0.000494	0.008	n/a	0.010	n/a	0.00029	0.00032	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.000368	0.000442	0.007	n/a	0.009	n/a	0.00029	0.00031	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.000008	0.000009	0.000	n/a	0.000	n/a	0.00001	0.00001	0.00012	n/a	0.00013	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.000007	0.000008	0.000	n/a	0.000	n/a	0.00001	0.00001	0.00012	n/a	0.00013	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000013	0.000015	0.042	n/a	0.050	n/a	0.000010	0.000010	0.032	n/a	0.034	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000012	0.000014	0.039	n/a	0.045	n/a	0.000009	0.000010	0.032	n/a	0.033	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00777	0.0117	0.016	n/a	0.023	n/a	0.00261	0.0038	0.005	n/a	0.008	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00598	0.00934	0.012	n/a	0.019	n/a	0.00230	0.00327	0.005	n/a	0.007	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0141	0.0187	0.283	n/a	0.187	n/a	0.00813	0.00950	0.163	n/a	0.095	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0121	0.0160	0.241	n/a	0.160	n/a	0.00777	0.00891	0.155	n/a	0.089	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0362	0.0496	0.103	n/a	0.142	n/a	0.0186	0.0227	0.053	n/a	0.065	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0301	0.0415	0.086	n/a	0.119	n/a	0.0176	0.0209	0.050	n/a	0.060	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D8. Brucejack Lake Outlet Hazard Quotients, Conservative Background

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00239	0.00240	0.002	n/a	0.002	n/a	0.231	0.295	0.231	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00240	0.00240	0.002	n/a	0.002	n/a	0.199	0.260	0.199	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	23.3	23.4	0.155	n/a	0.039	n/a	26.0	27.6	0.173	n/a	0.046	n/a
High Flow	-	-	150	600	0.393	1.00	23.4	23.4	0.156	n/a	0.039	n/a	25.7	27.1	0.171	n/a	0.045	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.176	0.176	0.018	n/a	0.018	n/a	0.313	0.397	0.031	n/a	0.040	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.176	0.176	0.018	n/a	0.018	n/a	0.294	0.305	0.029	n/a	0.031	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00157	0.00158	0.000157	n/a	0.000158	n/a	0.0049	0.0058	0.000492	n/a	0.000579	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00158	0.000158	n/a	0.000158	n/a	0.00450	0.00523	0.000450	n/a	0.000523	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	23.3	23.9	0.182	n/a	0.187	n/a	35.9	39.3	0.281	n/a	0.307	n/a
High Flow	-	-	128	-	26.3	33.0	23.4	23.8	0.183	n/a	0.186	n/a	34.2	37.4	0.267	n/a	0.292	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0308	0.0338	0.062	n/a	0.068	n/a	0.0423	0.0466	0.085	n/a	0.093	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0312	0.0330	0.062	n/a	0.066	n/a	0.0403	0.0444	0.081	n/a	0.089	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00526	0.00605	0.011	n/a	0.012	n/a	0.0072	0.0080	0.014	n/a	0.016	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00533	0.00582	0.011	n/a	0.012	n/a	0.0068	0.0075	0.014	n/a	0.015	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000005	0.000006	0.001	n/a	0.001	n/a	0.000018	0.000021	0.002	n/a	0.002	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000006	0.000006	0.001	n/a	0.001	n/a	0.000016	0.000019	0.002	n/a	0.002	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00010	0.00011	0.002	n/a	0.002	n/a	0.00071	0.00088	0.014	n/a	0.018	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00010	0.00010	0.002	n/a	0.002	n/a	0.00063	0.00079	0.013	n/a	0.016	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00005	0.00006	0.000	n/a	0.000	n/a	0.00039	0.00053	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00006	0.00006	0.000	n/a	0.000	n/a	0.00035	0.00048	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00029	0.00031	0.001	n/a	0.001	n/a	0.00104	0.00124	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00029	0.00031	0.001	n/a	0.001	n/a	0.00096	0.00113	0.003	n/a	0.004	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0306	0.0308	0.102	n/a	0.103	n/a	0.091	0.115	0.304	n/a	0.383	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0307	0.0308	0.102	n/a	0.103	n/a	0.083	0.104	0.278	n/a	0.348	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00010	0.00012	0.001	n/a	0.001	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00003	0.00003	0.000	n/a	0.000	n/a	0.00010	0.00011	0.000	n/a	0.001	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D8. Brucejack Lake Outlet Hazard Quotients, Conservative Background

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)				Operation Phase (22 years)							
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0064	0.0071	0.009	n/a	0.009	n/a	0.074	0.107	0.106	n/a	0.137	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0065	0.0069	0.009	n/a	0.008	n/a	0.065	0.095	0.089	n/a	0.110	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000014	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000011	0.000013	0.002	n/a	0.003	n/a	0.000007	0.000011	0.001	n/a	0.002	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00154	0.00163	0.003	n/a	0.003	n/a	0.00526	0.0065	0.011	n/a	0.013	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00155	0.00160	0.003	n/a	0.003	n/a	0.00474	0.00593	0.009	n/a	0.012	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0007	0.0008	0.001	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00026	0.00027	0.001	n/a	0.001	n/a	0.0006	0.0007	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.000608	0.000648	0.012	n/a	0.013	n/a	0.00083	0.00093	0.017	n/a	0.019	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.000613	0.000636	0.012	n/a	0.013	n/a	0.00079	0.00088	0.016	n/a	0.018	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000054	0.0000059	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000055	0.0000057	0.000	n/a	0.000	n/a	0.00002	0.00002	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000029	0.000031	0.096	n/a	0.104	n/a	0.000034	0.000038	0.115	n/a	0.126	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000029	0.000031	0.097	n/a	0.102	n/a	0.000033	0.000036	0.111	n/a	0.121	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00148	0.00152	0.003	n/a	0.003	n/a	0.0070	0.0118	0.014	n/a	0.024	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00149	0.00151	0.003	n/a	0.003	n/a	0.0065	0.0108	0.013	n/a	0.022	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0130	0.0159	0.259	n/a	0.159	n/a	0.0260	0.0307	0.520	n/a	0.307	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0133	0.0151	0.265	n/a	0.151	n/a	0.0237	0.0282	0.474	n/a	0.282	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0144	0.0145	0.041	n/a	0.041	n/a	0.0764	0.100	0.218	n/a	0.286	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0145	0.0145	0.041	n/a	0.041	n/a	0.0682	0.0895	0.195	n/a	0.256	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D8. Brucejack Lake Outlet Hazard Quotients, Conservative Background

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.114	0.185	0.114	n/a	0.185	n/a	0.0213	0.0427	0.021	n/a	0.043	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0821	0.142	0.082	n/a	0.142	n/a	0.0159	0.0333	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	26.2	27.3	0.174	n/a	0.045	n/a	24.7	25.0	0.165	n/a	0.042	n/a
High Flow	-	-	150	600	0.393	1.00	25.6	26.6	0.171	n/a	0.044	n/a	24.6	24.9	0.164	n/a	0.041	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.202	0.214	0.020	n/a	0.021	n/a	0.187	0.190	0.019	n/a	0.019	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.197	0.207	0.020	n/a	0.021	n/a	0.186	0.189	0.019	n/a	0.019	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00349	0.00467	0.000349	n/a	0.000467	n/a	0.00195	0.00231	0.000195	n/a	0.000231	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00296	0.00396	0.000296	n/a	0.000396	n/a	0.00187	0.00215	0.000187	n/a	0.000215	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	30.0	34.0	0.234	n/a	0.265	n/a	24.8	26.0	0.193	n/a	0.203	n/a
High Flow	-	-	128	-	26.3	33.0	28.2	31.6	0.220	n/a	0.247	n/a	24.4	25.4	0.191	n/a	0.199	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0332	0.0363	0.066	n/a	0.073	n/a	0.0291	0.0300	0.058	n/a	0.060	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0318	0.0345	0.064	n/a	0.069	n/a	0.0288	0.0296	0.058	n/a	0.059	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00564	0.00599	0.011	n/a	0.012	n/a	0.00525	0.00540	0.010	n/a	0.011	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00538	0.00572	0.011	n/a	0.011	n/a	0.00511	0.00525	0.010	n/a	0.011	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000021	0.000025	0.002	n/a	0.002	n/a	0.000026	0.000027	0.003	n/a	0.003	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000022	0.000024	0.002	n/a	0.002	n/a	0.000026	0.000027	0.003	n/a	0.003	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00031	0.00044	0.006	n/a	0.009	n/a	0.00013	0.00017	0.003	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00025	0.00036	0.005	n/a	0.007	n/a	0.00012	0.00016	0.002	n/a	0.003	n/a
Total Cobalt																		
Low Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00021	0.00028	0.000	n/a	0.001	n/a	0.00012	0.00014	0.000	n/a	0.000	n/a
High Flow	-	0.5	0.004	0.110	0.00005	0.00005	0.00018	0.00024	0.000	n/a	0.000	n/a	0.00011	0.00013	0.000	n/a	0.000	n/a
Total Copper																		
Low Flow	0.3	0.05	0.0009	0.0040	0.00041	0.00100	0.00083	0.00107	0.003	n/a	0.004	n/a	0.00051	0.00058	0.002	n/a	0.002	n/a
High Flow	0.3	0.05	0.0012	0.0040	0.00034	0.00005	0.00072	0.00093	0.002	n/a	0.003	n/a	0.00049	0.00055	0.002	n/a	0.002	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.053	0.064	0.175	n/a	0.215	n/a	0.0370	0.041	0.123	n/a	0.135	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.047	0.057	0.157	n/a	0.191	n/a	0.0360	0.0389	0.120	n/a	0.130	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00009	0.00011	0.000	n/a	0.001	n/a	0.00006	0.00007	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00008	0.00010	0.000	n/a	0.000	n/a	0.00006	0.0001	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D8. Brucejack Lake Outlet Hazard Quotients, Conservative Background

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.034	0.049	0.048	n/a	0.063	n/a	0.0131	0.018	0.019	n/a	0.023	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.026	0.040	0.036	n/a	0.046	n/a	0.0118	0.0157	0.016	n/a	0.018	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00247	0.00291	0.005	n/a	0.006	n/a	0.00189	0.00204	0.004	n/a	0.004	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00223	0.00263	0.004	n/a	0.005	n/a	0.00182	0.00195	0.004	n/a	0.004	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.0004	0.0005	0.001	n/a	0.001	n/a	0.00031	0.00034	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00038	0.0005	0.001	n/a	0.001	n/a	0.00030	0.00032	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00063	0.00066	0.013	n/a	0.013	n/a	0.00058	0.00059	0.012	n/a	0.012	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00061	0.00064	0.012	n/a	0.013	n/a	0.00058	0.00059	0.012	n/a	0.012	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000028	0.000029	0.093	n/a	0.096	n/a	0.000026	0.000027	0.088	n/a	0.089	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000027	0.000028	0.091	n/a	0.094	n/a	0.000026	0.000027	0.088	n/a	0.089	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00831	0.0117	0.017	n/a	0.023	n/a	0.00388	0.0049	0.008	n/a	0.010	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00675	0.00966	0.013	n/a	0.019	n/a	0.00359	0.00444	0.007	n/a	0.009	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0155	0.0193	0.311	n/a	0.193	n/a	0.0106	0.0118	0.213	n/a	0.118	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0138	0.0170	0.277	n/a	0.170	n/a	0.0104	0.0113	0.207	n/a	0.113	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0364	0.0489	0.104	n/a	0.140	n/a	0.0200	0.024	0.057	n/a	0.068	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0307	0.0414	0.088	n/a	0.118	n/a	0.0190	0.0221	0.054	n/a	0.063	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

¹ Lower Range, Pollution Control Objectives for The Mining, Smelting and Related Industries of British Columbia (Pollution Control Board 1979).

² Approved and working BC water quality guidelines; CCME guideline applied in the absence of applicable BC MOE guideline.

Table 13-D9. Brucejack Lake Outlet Hazard Quotients, Conservative Solids

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)						Operation Phase (22 years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.00240	0.00242	0.002	n/a	0.002	n/a	0.231	0.295	0.231	n/a	0.295	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.00241	0.00242	0.002	n/a	0.002	n/a	0.199	0.260	0.199	n/a	0.260	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	2.01	2.03	0.013	n/a	0.003	n/a	6.45	7.72	0.043	n/a	0.013	n/a
High Flow	-	-	150	600	0.393	1.00	2.02	2.03	0.013	n/a	0.003	n/a	5.84	7.00	0.039	n/a	0.012	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0879	0.0889	0.009	n/a	0.009	n/a	0.232	0.318	0.023	n/a	0.032	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.0884	0.0889	0.009	n/a	0.009	n/a	0.211	0.223	0.021	n/a	0.022	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00158	0.00159	0.000158	n/a	0.000159	n/a	0.0049	0.0058	0.000492	n/a	0.000579	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00158	0.00159	0.000158	n/a	0.000159	n/a	0.00450	0.00523	0.000450	n/a	0.000523	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	16.1	17.1	0.126	n/a	0.134	n/a	30.1	34.2	0.235	n/a	0.267	n/a
High Flow	-	-	128	-	26.3	33.0	16.3	16.9	0.127	n/a	0.132	n/a	28.0	31.9	0.219	n/a	0.250	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0194	0.0233	0.039	n/a	0.047	n/a	0.0321	0.0371	0.064	n/a	0.074	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0198	0.0223	0.040	n/a	0.045	n/a	0.0296	0.0345	0.059	n/a	0.069	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00354	0.00453	0.007	n/a	0.009	n/a	0.0079	0.0096	0.016	n/a	0.019	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00363	0.00425	0.007	n/a	0.009	n/a	0.0071	0.0087	0.014	n/a	0.017	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000012	0.000016	0.001	n/a	0.002	n/a	0.000024	0.000029	0.002	n/a	0.003	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000012	0.000015	0.001	n/a	0.001	n/a	0.000021	0.000027	0.002	n/a	0.003	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00006	0.00007	0.001	n/a	0.001	n/a	0.00081	0.00103	0.016	n/a	0.021	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00007	0.00007	0.001	n/a	0.001	n/a	0.00071	0.00092	0.014	n/a	0.018	n/a
Total Cobalt																		
Low Flow	-	0.5	0.0040	0.1100	0.00005	0.00005	0.00019	0.00027	0.000	n/a	0.001	n/a	0.00035	0.00047	0.001	n/a	0.001	n/a
High Flow	-	0.5	0.0040	0.1100	0.00005	0.00005	0.00019	0.00025	0.000	n/a	0.000	n/a	0.00031	0.00042	0.001	n/a	0.001	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00027	0.00029	0.001	n/a	0.001	n/a	0.00096	0.00119	0.003	n/a	0.004	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.00005	0.00028	0.00029	0.001	n/a	0.001	n/a	0.00087	0.00108	0.003	n/a	0.004	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0179	0.0181	0.060	n/a	0.060	n/a	0.0974	0.122	0.325	n/a	0.405	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0179	0.0180	0.060	n/a	0.060	n/a	0.0865	0.109	0.288	n/a	0.363	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00004	0.00004	0.000	n/a	0.000	n/a	0.00007	0.00009	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00004	0.00004	0.000	n/a	0.000	n/a	0.00007	0.00008	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D9. Brucejack Lake Outlet Hazard Quotients, Conservative Solids

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Construction Phase (2 years)				Operation Phase (22 years)							
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0063	0.0090	0.009	n/a	0.012	n/a	0.0693	0.101	0.099	n/a	0.130	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0066	0.0083	0.009	n/a	0.010	n/a	0.0601	0.0890	0.082	n/a	0.103	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000015	0.002	n/a	0.003	n/a	0.000008	0.000015	0.002	n/a	0.003	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000012	0.000015	0.002	n/a	0.003	n/a	0.000007	0.000013	0.001	n/a	0.003	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00092	0.00112	0.002	n/a	0.002	n/a	0.00716	0.0094	0.014	n/a	0.019	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00094	0.00106	0.002	n/a	0.002	n/a	0.00626	0.00834	0.013	n/a	0.017	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00039	0.00049	0.001	n/a	0.001	n/a	0.0008	0.0010	0.002	n/a	0.002	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00040	0.00046	0.001	n/a	0.001	n/a	0.0007	0.0009	0.001	n/a	0.002	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00040	0.00050	0.008	n/a	0.010	n/a	0.00070	0.00085	0.014	n/a	0.017	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00041	0.00047	0.008	n/a	0.009	n/a	0.00064	0.00078	0.013	n/a	0.016	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.0000059	0.0000066	0.000	n/a	0.000	n/a	0.00003	0.00004	0.001	n/a	0.001	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.0000059	0.0000064	0.000	n/a	0.000	n/a	0.00003	0.00004	0.001	n/a	0.001	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000017	0.000022	0.056	n/a	0.073	n/a	0.000024	0.000029	0.078	n/a	0.096	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000017	0.000020	0.057	n/a	0.068	n/a	0.000021	0.000026	0.071	n/a	0.088	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.00163	0.00171	0.003	n/a	0.003	n/a	0.0057	0.0112	0.011	n/a	0.022	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.00164	0.00169	0.003	n/a	0.003	n/a	0.0052	0.0102	0.010	n/a	0.020	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0122	0.0163	0.243	n/a	0.163	n/a	0.0251	0.0303	0.501	n/a	0.303	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0126	0.0151	0.253	n/a	0.151	n/a	0.0225	0.0275	0.449	n/a	0.275	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.0149	0.0152	0.043	n/a	0.043	n/a	0.095	0.119	0.270	n/a	0.339	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.0150	0.0151	0.043	n/a	0.043	n/a	0.084	0.106	0.239	n/a	0.303	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

n/a = parameter is not a COPC because predicted concentration is less than guideline; see Figure 13.6-1 for further details.

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Table 13-D9. Brucejack Lake Outlet Hazard Quotients, Conservative Solids

	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Ammonia																		
Low Flow	-	1.0	1.86	21.9	0.0025	0.003	0.114	0.185	0.114	n/a	0.185	n/a	0.0213	0.0427	0.021	n/a	0.043	n/a
High Flow	-	1.0	1.86	21.9	0.0031	0.0055	0.0821	0.142	0.082	n/a	0.142	n/a	0.0159	0.0333	0.016	n/a	0.033	n/a
Chloride																		
Low Flow	-	-	150	600	0.344	1.00	5.13	6.90	0.034	n/a	0.012	n/a	2.81	3.34	0.019	n/a	0.006	n/a
High Flow	-	-	150	600	0.393	1.00	4.30	5.83	0.029	n/a	0.010	n/a	2.64	3.10	0.018	n/a	0.005	n/a
Nitrate																		
Low Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.115	0.129	0.011	n/a	0.013	n/a	0.0953	0.100	0.010	n/a	0.010	n/a
High Flow	-	10.0	3.00	32.8	0.0025	0.0025	0.108	0.120	0.011	n/a	0.012	n/a	0.0942	0.0978	0.009	n/a	0.010	n/a
Nitrite																		
Low Flow	-	10.0	0.02	1.00	0.0025	0.0025	0.00349	0.00467	0.000349	n/a	0.000467	n/a	0.00196	0.00231	0.000196	n/a	0.000231	n/a
High Flow	-	10.0	0.02	1.00	0.0005	0.0005	0.00296	0.00396	0.000296	n/a	0.000396	n/a	0.00187	0.00215	0.000187	n/a	0.000215	n/a
Sulphate																		
Low Flow	-	-	128	-	7.1	10.2	22.3	26.6	0.174	n/a	0.207	n/a	16.7	18.0	0.131	n/a	0.141	n/a
High Flow	-	-	128	-	26.3	33.0	20.3	24.0	0.159	n/a	0.187	n/a	16.3	17.4	0.128	n/a	0.136	n/a
Total Aluminum																		
Low Flow	-	0.5	0.05	0.10	0.0069	0.011	0.0205	0.0240	0.041	n/a	0.048	n/a	0.0159	0.0169	0.032	n/a	0.034	n/a
High Flow	-	0.5	0.05	0.10	0.037	0.09	0.0189	0.0219	0.038	n/a	0.044	n/a	0.0156	0.0165	0.031	n/a	0.033	n/a
Total Arsenic																		
Low Flow	0.5	0.1	0.0050	-	0.0009	0.0020	0.00496	0.00559	0.010	n/a	0.011	n/a	0.00433	0.00462	0.009	n/a	0.009	n/a
High Flow	0.5	0.1	0.0050	-	0.0011	0.0024	0.00445	0.00506	0.009	n/a	0.010	n/a	0.00401	0.00430	0.008	n/a	0.009	n/a
Total Cadmium																		
Low Flow	-	0.01	0.00001	0.00044	0.000005	0.000005	0.000013	0.000018	0.001	n/a	0.002	n/a	0.000007	0.000009	0.001	n/a	0.001	n/a
High Flow	-	0.01	0.00001	0.00060	0.000032	0.000100	0.000011	0.000015	0.001	n/a	0.002	n/a	0.000007	0.000008	0.001	n/a	0.001	n/a
Total Chromium																		
Low Flow	-	0.05	-	0.0010	0.00006	0.00011	0.00029	0.00044	0.006	n/a	0.009	n/a	0.00010	0.00015	0.002	n/a	0.003	n/a
High Flow	-	0.05	-	0.0010	0.00013	0.00025	0.00023	0.00035	0.005	n/a	0.007	n/a	0.00009	0.00013	0.002	n/a	0.003	n/a
Total Cobalt																		
Low Flow	-	0.5	0.0040	0.1100	0.00005	0.00005	0.00015	0.00021	0.000	n/a	0.000	n/a	0.00007	0.00009	0.000	n/a	0.000	n/a
High Flow	-	0.5	0.0040	0.1100	0.00005	0.00005	0.00012	0.00017	0.000	n/a	0.000	n/a	0.00006	0.00008	0.000	n/a	0.000	n/a
Total Copper																		
Low Flow	0.3	0.05	0.001	0.0040	0.00041	0.00100	0.00074	0.00104	0.002	n/a	0.003	n/a	0.00036	0.00045	0.001	n/a	0.001	n/a
High Flow	0.3	0.05	0.001	0.0040	0.00034	0.00005	0.00061	0.00086	0.002	n/a	0.003	n/a	0.00034	0.00041	0.001	n/a	0.001	n/a
Total Iron																		
Low Flow	-	0.3	-	1.00	0.0300	0.120	0.0407	0.0546	0.136	n/a	0.182	n/a	0.0224	0.027	0.075	n/a	0.089	n/a
High Flow	-	0.3	-	1.00	0.092	0.39	0.0343	0.0462	0.114	n/a	0.154	n/a	0.0212	0.0247	0.071	n/a	0.082	n/a
Total Lead																		
Low Flow	0.2	0.1	0.0038	0.0117	0.00021	0.00050	0.00005	0.00006	0.000	n/a	0.000	n/a	0.00004	0.00004	0.000	n/a	0.000	n/a
High Flow	0.2	0.1	0.0040	0.0170	0.00033	0.00100	0.00005	0.00006	0.000	n/a	0.000	n/a	0.00003	0.0000	0.000	n/a	0.000	n/a

Notes:

- guideline not available

HQ = hazard quotient

High Flow, open water period = June through October

Low Flow, under-ice = November through May

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	MMER	Pollution Control Objectives ¹	30-day Guideline ² (mg/L)	Maximum Guideline ² (mg/L)	Mean Baseline (mg/L)	Maximum Baseline (mg/L)	Closure Phase (2 years)						Post-closure Phase (3 Years)					
							Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline	Mean Predicted (mg/L)	Maximum Predicted (mg/L)	HQ: Mean Predicted/ Guideline	HQ: Mean Predicted/ Baseline	HQ: Maximum Predicted/ Guideline	HQ: Maximum Predicted/ Baseline
Total Manganese																		
Low Flow	-	0.1	0.70	0.78	0.0017	0.0030	0.0270	0.0420	0.038	n/a	0.054	n/a	0.00728	0.012	0.010	n/a	0.015	n/a
High Flow	-	0.1	0.73	0.86	0.0042	0.0089	0.0200	0.0329	0.027	n/a	0.038	n/a	0.00597	0.010	0.008	n/a	0.011	n/a
Total Mercury																		
Low Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
High Flow	-	0.005	0.00002	-	0.000005	0.000005	0.000005	0.000005	0.001	n/a	0.001	n/a	0.000005	0.000005	0.001	n/a	0.001	n/a
Total Molybdenum																		
Low Flow	-	0.5	1.00	2.00	0.00032	0.00050	0.00243	0.00311	0.005	n/a	0.006	n/a	0.00157	0.00182	0.003	n/a	0.004	n/a
High Flow	-	0.5	1.00	2.00	0.00070	0.0060	0.00203	0.00266	0.004	n/a	0.005	n/a	0.00142	0.00164	0.003	n/a	0.003	n/a
Total Nickel																		
Low Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.0004	0.0005	0.001	n/a	0.001	n/a	0.00028	0.00031	0.001	n/a	0.001	n/a
High Flow	0.5	0.2	-	0.025	0.00025	0.00025	0.00036	0.0004	0.001	n/a	0.001	n/a	0.00028	0.00030	0.001	n/a	0.001	n/a
Total Selenium																		
Low Flow	-	0.1	0.002	-	0.00005	0.00005	0.00036	0.00041	0.007	n/a	0.008	n/a	0.00029	0.00031	0.006	n/a	0.006	n/a
High Flow	-	0.1	0.002	-	0.00008	0.00013	0.00033	0.00038	0.007	n/a	0.008	n/a	0.00028	0.00030	0.006	n/a	0.006	n/a
Total Silver																		
Low Flow	-	0.1	0.00005	0.00010	0.00004	0.00020	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
High Flow	-	0.1	0.00005	0.00010	0.00027	0.00500	0.00001	0.00001	0.000	n/a	0.000	n/a	0.00001	0.00001	0.000	n/a	0.000	n/a
Total Thallium																		
Low Flow	-	-	0.0003	-	0.00001	0.00001	0.000012	0.000014	0.040	n/a	0.046	n/a	0.000010	0.000010	0.033	n/a	0.034	n/a
High Flow	-	-	0.0003	-	0.00003	0.0001	0.000011	0.000013	0.037	n/a	0.042	n/a	0.000010	0.000010	0.032	n/a	0.033	n/a
Total Zinc																		
Low Flow	0.5	0.2	0.0075	0.0330	0.0033	0.0110	0.0074	0.0111	0.015	n/a	0.022	n/a	0.00258	0.0037	0.005	n/a	0.007	n/a
High Flow	0.5	0.2	0.0075	0.0330	0.0111	0.1700	0.0057	0.0089	0.011	n/a	0.018	n/a	0.00228	0.00320	0.005	n/a	0.006	n/a
Dissolved Aluminum																		
Low Flow	-	-	0.05	0.10	0.0026	0.0050	0.0129	0.0166	0.258	n/a	0.166	n/a	0.0080	0.0091	0.160	n/a	0.091	n/a
High Flow	-	-	0.05	0.10	0.0060	0.0179	0.0112	0.0144	0.223	n/a	0.144	n/a	0.0077	0.0086	0.154	n/a	0.086	n/a
Dissolved Iron																		
Low Flow	-	-	-	0.350	0.0169	0.0300	0.038	0.052	0.107	n/a	0.147	n/a	0.0191	0.023	0.054	n/a	0.067	n/a
High Flow	-	-	-	0.350	0.0148	0.0150	0.031	0.043	0.089	n/a	0.123	n/a	0.0179	0.0214	0.051	n/a	0.061	n/a

Notes:

- guideline not available

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