

Appendix 8-G

Murray River Coal Project: Comparison of Predicted Water Quality to Water Quality Guidelines

- 8-G1 Decline Site Pond
- 8-G2 Shaft Site Pond
- 8-G3 Coal Processing Plant Pond
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MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G1
Decline Site Pond

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G1a. Decline Site Pond Hazard Quotients for Total Aluminum, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Aluminum Concentration				
		Median	Mean	Maximum	BC MOE 30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.0238	0.0230	0.0268	5	0.00460
	February	0.0212	0.0221	0.0268	5	0.00443
	March	0.0194	0.0215	0.0268	5	0.00431
	April	0.0185	0.0212	0.0269	5	0.00424
	May	0.0237	0.0255	0.0305	5	0.00510
	June	0.0275	0.0292	0.0341	5	0.00585
	July	0.0265	0.0289	0.0346	5	0.00579
	August	0.0267	0.0285	0.0348	5	0.00571
	September	0.0268	0.0281	0.0349	5	0.00561
	October	0.0268	0.0276	0.0349	5	0.00552
	November	0.0268	0.0272	0.0349	5	0.00545
	December	0.0268	0.0269	0.0349	5	0.00538
Operations (2018-2042)	January	0.0333	0.0333	0.0337	5	0.00666
	February	0.0333	0.0333	0.0333	5	0.00665
	March	0.0333	0.0333	0.0333	5	0.00665
	April	0.0333	0.0333	0.0333	5	0.00665
	May	0.0333	0.0333	0.0333	5	0.00665
	June	0.0333	0.0333	0.0333	5	0.00665
	July	0.0333	0.0333	0.0333	5	0.00665
	August	0.0333	0.0333	0.0333	5	0.00665
	September	0.0333	0.0333	0.0333	5	0.00665
	October	0.0333	0.0333	0.0333	5	0.00665
	November	0.0333	0.0333	0.0333	5	0.00665
	December	0.0333	0.0333	0.0333	5	0.00665
Closure (2043-2060)	January	0.0333	0.0333	0.0333	5	0.00665
	February	0.0333	0.0333	0.0333	5	0.00665
	March	0.0333	0.0333	0.0333	5	0.00665
	April	0.0333	0.0333	0.0333	5	0.00665
	May	0.0333	0.0333	0.0333	5	0.00665
	June	0.0333	0.0333	0.0333	5	0.00665
	July	0.0333	0.0333	0.0333	5	0.00665
	August	0.0333	0.0333	0.0333	5	0.00665
	September	0.0333	0.0333	0.0333	5	0.00665
	October	0.0333	0.0333	0.0333	5	0.00665
	November	0.0333	0.0333	0.0333	5	0.00665
	December	0.0333	0.0333	0.0333	5	0.00665

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1b. Decline Site Pond Hazard Quotients for Total Arsenic, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Arsenic Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00205	0.00206	0.00211	0.025	0.0846
	February	0.00205	0.00206	0.00211	0.025	0.0843
	March	0.00205	0.00206	0.00210	0.025	0.0841
	April	0.00205	0.00206	0.00210	0.025	0.0839
	May	0.00204	0.00204	0.00206	0.025	0.0825
	June	0.00202	0.00202	0.00203	0.025	0.0813
	July	0.00202	0.00202	0.00204	0.025	0.0815
	August	0.00202	0.00203	0.00205	0.025	0.0820
	September	0.00203	0.00203	0.00206	0.025	0.0824
	October	0.00203	0.00203	0.00207	0.025	0.0826
	November	0.00203	0.00203	0.00206	0.025	0.0826
	December	0.00203	0.00203	0.00206	0.025	0.0826
Operations (2018-2042)	January	0.00191	0.00191	0.00194	0.025	0.0774
	February	0.00191	0.00191	0.00191	0.025	0.0765
	March	0.00191	0.00191	0.00191	0.025	0.0765
	April	0.00191	0.00191	0.00191	0.025	0.0765
	May	0.00191	0.00191	0.00191	0.025	0.0765
	June	0.00191	0.00191	0.00191	0.025	0.0765
	July	0.00191	0.00191	0.00191	0.025	0.0765
	August	0.00191	0.00191	0.00191	0.025	0.0765
	September	0.00191	0.00191	0.00191	0.025	0.0765
	October	0.00191	0.00191	0.00191	0.025	0.0765
	November	0.00191	0.00191	0.00191	0.025	0.0765
	December	0.00191	0.00191	0.00191	0.025	0.0765
Closure (2043-2060)	January	0.00191	0.00191	0.00191	0.025	0.0765
	February	0.00191	0.00191	0.00191	0.025	0.0765
	March	0.00191	0.00191	0.00191	0.025	0.0765
	April	0.00191	0.00191	0.00191	0.025	0.0765
	May	0.00191	0.00191	0.00191	0.025	0.0765
	June	0.00191	0.00191	0.00191	0.025	0.0765
	July	0.00191	0.00191	0.00191	0.025	0.0765
	August	0.00191	0.00191	0.00191	0.025	0.0765
	September	0.00191	0.00191	0.00191	0.025	0.0765
	October	0.00191	0.00191	0.00191	0.025	0.0765
	November	0.00191	0.00191	0.00191	0.025	0.0765
	December	0.00191	0.00191	0.00191	0.025	0.0765

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1c. Decline Site Pond Hazard Quotients for Total Boron, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply		
		Total Boron Concentration					Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0567	0.0571	0.0585	5	0.0117		
	February	0.0566	0.0570	0.0583	5	0.0117		
	March	0.0566	0.0569	0.0582	5	0.0116		
	April	0.0566	0.0569	0.0580	5	0.0116		
	May	0.0563	0.0564	0.0571	5	0.0114		
	June	0.0559	0.0558	0.0562	5	0.0112		
	July	0.0559	0.0559	0.0563	5	0.0113		
	August	0.0560	0.0560	0.0567	5	0.0113		
	September	0.0560	0.0562	0.0570	5	0.0114		
	October	0.0560	0.0562	0.0571	5	0.0114		
	November	0.0560	0.0562	0.0571	5	0.0114		
	December	0.0560	0.0562	0.0571	5	0.0114		
Operations (2018-2042)	January	0.0528	0.0528	0.0535	5	0.0107		
	February	0.0528	0.0528	0.0528	5	0.0106		
	March	0.0528	0.0528	0.0528	5	0.0106		
	April	0.0528	0.0528	0.0528	5	0.0106		
	May	0.0528	0.0528	0.0528	5	0.0106		
	June	0.0528	0.0528	0.0528	5	0.0106		
	July	0.0528	0.0528	0.0528	5	0.0106		
	August	0.0528	0.0528	0.0528	5	0.0106		
	September	0.0528	0.0528	0.0528	5	0.0106		
	October	0.0528	0.0528	0.0528	5	0.0106		
	November	0.0528	0.0528	0.0528	5	0.0106		
	December	0.0528	0.0528	0.0528	5	0.0106		
Closure (2043-2060)	January	0.0528	0.0528	0.0528	5	0.0106		
	February	0.0528	0.0528	0.0528	5	0.0106		
	March	0.0528	0.0528	0.0528	5	0.0106		
	April	0.0528	0.0528	0.0528	5	0.0106		
	May	0.0528	0.0528	0.0528	5	0.0106		
	June	0.0528	0.0528	0.0528	5	0.0106		
	July	0.0528	0.0528	0.0528	5	0.0106		
	August	0.0528	0.0528	0.0528	5	0.0106		
	September	0.0528	0.0528	0.0528	5	0.0106		
	October	0.0528	0.0528	0.0528	5	0.0106		
	November	0.0528	0.0528	0.0528	5	0.0106		
	December	0.0528	0.0528	0.0528	5	0.0106		

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1d. Decline Site Pond Hazard Quotients for Total Copper, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.000394	0.000394	0.000404	0.3	0.00131
	February	0.000394	0.000392	0.000398	0.3	0.00131
	March	0.000394	0.000390	0.000394	0.3	0.00130
	April	0.000391	0.000389	0.000394	0.3	0.00130
	May	0.000394	0.000393	0.000399	0.3	0.00131
	June	0.000396	0.000397	0.000403	0.3	0.00132
	July	0.000394	0.000397	0.000404	0.3	0.00132
	August	0.000394	0.000397	0.000405	0.3	0.00132
	September	0.000394	0.000397	0.000405	0.3	0.00132
	October	0.000394	0.000397	0.000406	0.3	0.00132
	November	0.000394	0.000396	0.000406	0.3	0.00132
	December	0.000394	0.000395	0.000406	0.3	0.00132
Operations (2018-2042)	January	0.000386	0.000386	0.000391	0.3	0.00129
	February	0.000386	0.000386	0.000386	0.3	0.00129
	March	0.000386	0.000386	0.000386	0.3	0.00129
	April	0.000386	0.000386	0.000386	0.3	0.00129
	May	0.000386	0.000386	0.000386	0.3	0.00129
	June	0.000386	0.000386	0.000386	0.3	0.00129
	July	0.000386	0.000386	0.000386	0.3	0.00129
	August	0.000386	0.000386	0.000386	0.3	0.00129
	September	0.000386	0.000386	0.000386	0.3	0.00129
	October	0.000386	0.000386	0.000386	0.3	0.00129
	November	0.000386	0.000386	0.000386	0.3	0.00129
	December	0.000386	0.000386	0.000386	0.3	0.00129
Closure (2043-2060)	January	0.000386	0.000386	0.000386	0.3	0.00129
	February	0.000386	0.000386	0.000386	0.3	0.00129
	March	0.000386	0.000386	0.000386	0.3	0.00129
	April	0.000386	0.000386	0.000386	0.3	0.00129
	May	0.000386	0.000386	0.000386	0.3	0.00129
	June	0.000386	0.000386	0.000386	0.3	0.00129
	July	0.000386	0.000386	0.000386	0.3	0.00129
	August	0.000386	0.000386	0.000386	0.3	0.00129
	September	0.000386	0.000386	0.000386	0.3	0.00129
	October	0.000386	0.000386	0.000386	0.3	0.00129
	November	0.000386	0.000386	0.000386	0.3	0.00129
	December	0.000386	0.000386	0.000386	0.3	0.00129

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1e. Decline Site Pond Hazard Quotients for Total Lead, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration				
		Median	Mean	Maximum	BC MOE 30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.0000270	0.0000262	0.0000288	0.1	0.000262
	February	0.0000251	0.0000256	0.0000288	0.1	0.000256
	March	0.0000238	0.0000251	0.0000288	0.1	0.000251
	April	0.0000229	0.0000248	0.0000288	0.1	0.000248
	May	0.0000265	0.0000277	0.0000313	0.1	0.000277
	June	0.0000291	0.0000303	0.0000338	0.1	0.000303
	July	0.0000285	0.0000303	0.0000343	0.1	0.000303
	August	0.0000287	0.0000300	0.0000345	0.1	0.000300
	September	0.0000287	0.0000297	0.0000346	0.1	0.000297
	October	0.0000288	0.0000294	0.0000346	0.1	0.000294
	November	0.0000288	0.0000291	0.0000346	0.1	0.000291
	December	0.0000288	0.0000289	0.0000346	0.1	0.000289
Operations (2018-2042)	January	0.0000329	0.0000329	0.0000333	0.1	0.000329
	February	0.0000329	0.0000329	0.0000329	0.1	0.000329
	March	0.0000329	0.0000329	0.0000329	0.1	0.000329
	April	0.0000329	0.0000329	0.0000329	0.1	0.000329
	May	0.0000329	0.0000329	0.0000329	0.1	0.000329
	June	0.0000329	0.0000329	0.0000329	0.1	0.000329
	July	0.0000329	0.0000329	0.0000329	0.1	0.000329
	August	0.0000329	0.0000329	0.0000329	0.1	0.000329
	September	0.0000329	0.0000329	0.0000329	0.1	0.000329
	October	0.0000329	0.0000329	0.0000329	0.1	0.000329
	November	0.0000329	0.0000329	0.0000329	0.1	0.000329
	December	0.0000329	0.0000329	0.0000329	0.1	0.000329
Closure (2043-2060)	January	0.0000329	0.0000329	0.0000329	0.1	0.000329
	February	0.0000329	0.0000329	0.0000329	0.1	0.000329
	March	0.0000329	0.0000329	0.0000329	0.1	0.000329
	April	0.0000329	0.0000329	0.0000329	0.1	0.000329
	May	0.0000329	0.0000329	0.0000329	0.1	0.000329
	June	0.0000329	0.0000329	0.0000329	0.1	0.000329
	July	0.0000329	0.0000329	0.0000329	0.1	0.000329
	August	0.0000329	0.0000329	0.0000329	0.1	0.000329
	September	0.0000329	0.0000329	0.0000329	0.1	0.000329
	October	0.0000329	0.0000329	0.0000329	0.1	0.000329
	November	0.0000329	0.0000329	0.0000329	0.1	0.000329
	December	0.0000329	0.0000329	0.0000329	0.1	0.000329

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1f. Decline Site Pond Hazard Quotients for Total Mercury, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			BC MOE 30-Day Mean if MeHg is 0.5% of THg	Mean Guideline if MeHg is 0.5% of THg
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00000255	0.00000257	0.00000264	0.00002	0.128
	February	0.00000255	0.00000256	0.00000261	0.00002	0.128
	March	0.00000255	0.00000255	0.00000258	0.00002	0.128
	April	0.00000256	0.00000255	0.00000257	0.00002	0.127
	May	0.00000256	0.00000255	0.00000257	0.00002	0.127
	June	0.00000255	0.00000255	0.00000258	0.00002	0.128
	July	0.00000255	0.00000256	0.00000258	0.00002	0.128
	August	0.00000256	0.00000257	0.00000259	0.00002	0.128
	September	0.00000256	0.00000257	0.00000259	0.00002	0.128
	October	0.00000255	0.00000257	0.00000260	0.00002	0.128
	November	0.00000255	0.00000256	0.00000260	0.00002	0.128
	December	0.00000255	0.00000256	0.00000260	0.00002	0.128
Operations (2018-2042)	January	0.00000247	0.00000247	0.00000250	0.00002	0.124
	February	0.00000247	0.00000247	0.00000247	0.00002	0.124
	March	0.00000247	0.00000247	0.00000247	0.00002	0.124
	April	0.00000247	0.00000247	0.00000247	0.00002	0.124
	May	0.00000247	0.00000247	0.00000247	0.00002	0.124
	June	0.00000247	0.00000247	0.00000247	0.00002	0.124
	July	0.00000247	0.00000247	0.00000247	0.00002	0.124
	August	0.00000247	0.00000247	0.00000247	0.00002	0.124
	September	0.00000247	0.00000247	0.00000247	0.00002	0.124
	October	0.00000247	0.00000247	0.00000247	0.00002	0.124
	November	0.00000247	0.00000247	0.00000247	0.00002	0.124
	December	0.00000247	0.00000247	0.00000247	0.00002	0.124
Closure (2043-2060)	January	0.00000247	0.00000247	0.00000247	0.00002	0.124
	February	0.00000247	0.00000247	0.00000247	0.00002	0.124
	March	0.00000247	0.00000247	0.00000247	0.00002	0.124
	April	0.00000247	0.00000247	0.00000247	0.00002	0.124
	May	0.00000247	0.00000247	0.00000247	0.00002	0.124
	June	0.00000247	0.00000247	0.00000247	0.00002	0.124
	July	0.00000247	0.00000247	0.00000247	0.00002	0.124
	August	0.00000247	0.00000247	0.00000247	0.00002	0.124
	September	0.00000247	0.00000247	0.00000247	0.00002	0.124
	October	0.00000247	0.00000247	0.00000247	0.00002	0.124
	November	0.00000247	0.00000247	0.00000247	0.00002	0.124
	December	0.00000247	0.00000247	0.00000247	0.00002	0.124

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1g. Decline Site Pond Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00339	0.00342	0.00350	0.05	0.0700
	February	0.00339	0.00341	0.00349	0.05	0.0698
	March	0.00339	0.00341	0.00348	0.05	0.0696
	April	0.00339	0.00341	0.00347	0.05	0.0694
	May	0.00337	0.00337	0.00341	0.05	0.0683
	June	0.00335	0.00334	0.00336	0.05	0.0673
	July	0.00335	0.00334	0.00337	0.05	0.0674
	August	0.00335	0.00336	0.00340	0.05	0.0679
	September	0.00335	0.00336	0.00341	0.05	0.0682
	October	0.00336	0.00337	0.00342	0.05	0.0684
	November	0.00335	0.00337	0.00342	0.05	0.0684
	December	0.00335	0.00337	0.00342	0.05	0.0684
Operations (2018-2042)	January	0.00316	0.00317	0.00320	0.05	0.0641
	February	0.00316	0.00316	0.00316	0.05	0.0633
	March	0.00316	0.00316	0.00316	0.05	0.0633
	April	0.00316	0.00316	0.00316	0.05	0.0633
	May	0.00316	0.00316	0.00316	0.05	0.0633
	June	0.00316	0.00316	0.00316	0.05	0.0633
	July	0.00316	0.00316	0.00316	0.05	0.0633
	August	0.00316	0.00316	0.00316	0.05	0.0633
	September	0.00316	0.00316	0.00316	0.05	0.0633
	October	0.00316	0.00316	0.00316	0.05	0.0633
	November	0.00316	0.00316	0.00316	0.05	0.0633
	December	0.00316	0.00316	0.00316	0.05	0.0633
Closure (2043-2060)	January	0.00316	0.00316	0.00316	0.05	0.0633
	February	0.00316	0.00316	0.00316	0.05	0.0633
	March	0.00316	0.00316	0.00316	0.05	0.0633
	April	0.00316	0.00316	0.00316	0.05	0.0633
	May	0.00316	0.00316	0.00316	0.05	0.0633
	June	0.00316	0.00316	0.00316	0.05	0.0633
	July	0.00316	0.00316	0.00316	0.05	0.0633
	August	0.00316	0.00316	0.00316	0.05	0.0633
	September	0.00316	0.00316	0.00316	0.05	0.0633
	October	0.00316	0.00316	0.00316	0.05	0.0633
	November	0.00316	0.00316	0.00316	0.05	0.0633
	December	0.00316	0.00316	0.00316	0.05	0.0633

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1h. Decline Site Pond Hazard Quotients for Total Selenium, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Selenium Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00133	0.00134	0.00138	0.002	0.688
	February	0.00133	0.00134	0.00137	0.002	0.686
	March	0.00133	0.00134	0.00137	0.002	0.684
	April	0.00133	0.00134	0.00137	0.002	0.683
	May	0.00132	0.00133	0.00134	0.002	0.671
	June	0.00132	0.00131	0.00132	0.002	0.661
	July	0.00132	0.00131	0.00133	0.002	0.663
	August	0.00132	0.00132	0.00133	0.002	0.667
	September	0.00132	0.00132	0.00134	0.002	0.670
	October	0.00132	0.00132	0.00134	0.002	0.672
	November	0.00132	0.00132	0.00134	0.002	0.672
	December	0.00132	0.00132	0.00134	0.002	0.672
Operations (2018-2042)	January	0.00124	0.00124	0.00126	0.002	0.629
	February	0.00124	0.00124	0.00124	0.002	0.622
	March	0.00124	0.00124	0.00124	0.002	0.622
	April	0.00124	0.00124	0.00124	0.002	0.622
	May	0.00124	0.00124	0.00124	0.002	0.622
	June	0.00124	0.00124	0.00124	0.002	0.622
	July	0.00124	0.00124	0.00124	0.002	0.622
	August	0.00124	0.00124	0.00124	0.002	0.622
	September	0.00124	0.00124	0.00124	0.002	0.622
	October	0.00124	0.00124	0.00124	0.002	0.622
	November	0.00124	0.00124	0.00124	0.002	0.622
	December	0.00124	0.00124	0.00124	0.002	0.622
Closure (2043-2060)	January	0.00124	0.00124	0.00124	0.002	0.622
	February	0.00124	0.00124	0.00124	0.002	0.622
	March	0.00124	0.00124	0.00124	0.002	0.622
	April	0.00124	0.00124	0.00124	0.002	0.622
	May	0.00124	0.00124	0.00124	0.002	0.622
	June	0.00124	0.00124	0.00124	0.002	0.622
	July	0.00124	0.00124	0.00124	0.002	0.622
	August	0.00124	0.00124	0.00124	0.002	0.622
	September	0.00124	0.00124	0.00124	0.002	0.622
	October	0.00124	0.00124	0.00124	0.002	0.622
	November	0.00124	0.00124	0.00124	0.002	0.622
	December	0.00124	0.00124	0.00124	0.002	0.622

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1i. Decline Site Pond Hazard Quotients for Total Chloride, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Chloride Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	7.54	7.58	7.77	600	0.0129
	February	7.52	7.57	7.75	600	0.0129
	March	7.52	7.56	7.73	600	0.0129
	April	7.52	7.56	7.71	600	0.0129
	May	7.48	7.48	7.58	600	0.0126
	June	7.43	7.41	7.46	600	0.0124
	July	7.42	7.41	7.48	600	0.0125
	August	7.43	7.44	7.53	600	0.0126
	September	7.44	7.45	7.57	600	0.0126
	October	7.44	7.46	7.59	600	0.0127
	November	7.44	7.46	7.59	600	0.0127
	December	7.44	7.46	7.59	600	0.0126
Operations (2018-2042)	January	7.00	7.01	7.09	600	0.0118
	February	7.00	7.00	7.00	600	0.0117
	March	7.00	7.00	7.00	600	0.0117
	April	7.00	7.00	7.00	600	0.0117
	May	7.00	7.00	7.00	600	0.0117
	June	7.00	7.00	7.00	600	0.0117
	July	7.00	7.00	7.00	600	0.0117
	August	7.00	7.00	7.00	600	0.0117
	September	7.00	7.00	7.00	600	0.0117
	October	7.00	7.00	7.00	600	0.0117
	November	7.00	7.00	7.00	600	0.0117
	December	7.00	7.00	7.00	600	0.0117
Closure (2043-2060)	January	7.00	7.00	7.00	600	0.0117
	February	7.00	7.00	7.00	600	0.0117
	March	7.00	7.00	7.00	600	0.0117
	April	7.00	7.00	7.00	600	0.0117
	May	7.00	7.00	7.00	600	0.0117
	June	7.00	7.00	7.00	600	0.0117
	July	7.00	7.00	7.00	600	0.0117
	August	7.00	7.00	7.00	600	0.0117
	September	7.00	7.00	7.00	600	0.0117
	October	7.00	7.00	7.00	600	0.0117
	November	7.00	7.00	7.00	600	0.0117
	December	7.00	7.00	7.00	600	0.0117

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G1j. Decline Site Pond Hazard Quotients for Total Fluoride, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Fluoride Concentration			30-Day Mean	Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.140	0.141	0.145	1	1.5	0.141	0.0965
	February	0.140	0.141	0.144	1	1.5	0.141	0.0961
	March	0.140	0.141	0.144	1	1.5	0.141	0.0959
	April	0.140	0.141	0.143	1	1.5	0.141	0.0957
	May	0.139	0.140	0.141	1	1.5	0.140	0.0941
	June	0.139	0.138	0.139	1	1.5	0.138	0.0928
	July	0.138	0.138	0.139	1	1.5	0.138	0.0930
	August	0.139	0.139	0.140	1	1.5	0.139	0.0936
	September	0.139	0.139	0.141	1	1.5	0.139	0.0940
	October	0.139	0.139	0.141	1	1.5	0.139	0.0942
	November	0.139	0.139	0.141	1	1.5	0.139	0.0942
	December	0.139	0.139	0.141	1	1.5	0.139	0.0941
Operations (2018-2042)	January	0.131	0.131	0.133	1	1.5	0.131	0.0885
	February	0.131	0.131	0.131	1	1.5	0.131	0.0874
	March	0.131	0.131	0.131	1	1.5	0.131	0.0874
	April	0.131	0.131	0.131	1	1.5	0.131	0.0874
	May	0.131	0.131	0.131	1	1.5	0.131	0.0874
	June	0.131	0.131	0.131	1	1.5	0.131	0.0874
	July	0.131	0.131	0.131	1	1.5	0.131	0.0874
	August	0.131	0.131	0.131	1	1.5	0.131	0.0874
	September	0.131	0.131	0.131	1	1.5	0.131	0.0874
	October	0.131	0.131	0.131	1	1.5	0.131	0.0874
	November	0.131	0.131	0.131	1	1.5	0.131	0.0874
	December	0.131	0.131	0.131	1	1.5	0.131	0.0874
Closure (2043-2060)	January	0.131	0.131	0.131	1	1.5	0.131	0.0874
	February	0.131	0.131	0.131	1	1.5	0.131	0.0874
	March	0.131	0.131	0.131	1	1.5	0.131	0.0874
	April	0.131	0.131	0.131	1	1.5	0.131	0.0874
	May	0.131	0.131	0.131	1	1.5	0.131	0.0874
	June	0.131	0.131	0.131	1	1.5	0.131	0.0874
	July	0.131	0.131	0.131	1	1.5	0.131	0.0874
	August	0.131	0.131	0.131	1	1.5	0.131	0.0874
	September	0.131	0.131	0.131	1	1.5	0.131	0.0874
	October	0.131	0.131	0.131	1	1.5	0.131	0.0874
	November	0.131	0.131	0.131	1	1.5	0.131	0.0874
	December	0.131	0.131	0.131	1	1.5	0.131	0.0874

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2
Shaft Site Pond

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G2a. Shaft Site Pond Hazard Quotients for Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Aluminum Concentration			BC MOE 30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	2.37	2.37	2.39	5	0.474
	February	2.37	2.37	2.39	5	0.474
	March	2.37	2.37	2.39	5	0.474
	April	2.37	2.37	2.39	5	0.473
	May	2.52	2.54	2.57	5	0.507
	June	2.52	2.53	2.55	5	0.506
	July	2.45	2.45	2.46	5	0.490
	August	2.39	2.39	2.41	5	0.478
	September	2.39	2.39	2.40	5	0.478
	October	2.39	2.39	2.40	5	0.478
	November	2.39	2.39	2.40	5	0.478
	December	2.39	2.39	2.40	5	0.477
Operations (2018-2042)	January	2.28	2.28	2.40	5	0.457
	February	2.28	2.28	2.40	5	0.457
	March	2.28	2.28	2.40	5	0.457
	April	2.28	2.28	2.40	5	0.457
	May	2.28	2.29	2.51	5	0.457
	June	2.28	2.29	2.51	5	0.457
	July	2.28	2.28	2.45	5	0.457
	August	2.28	2.28	2.42	5	0.457
	September	2.28	2.28	2.42	5	0.457
	October	2.28	2.28	2.42	5	0.457
	November	2.28	2.28	2.42	5	0.457
	December	2.28	2.28	2.42	5	0.457
Closure (2043-2060)	January	2.28	2.28	2.28	5	0.456
	February	2.28	2.28	2.28	5	0.456
	March	2.28	2.28	2.28	5	0.456
	April	2.28	2.28	2.28	5	0.456
	May	2.28	2.28	2.28	5	0.456
	June	2.28	2.28	2.28	5	0.456
	July	2.28	2.28	2.28	5	0.456
	August	2.28	2.28	2.28	5	0.456
	September	2.28	2.28	2.28	5	0.456
	October	2.28	2.28	2.28	5	0.456
	November	2.28	2.28	2.28	5	0.456
	December	2.28	2.28	2.28	5	0.456

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2b. Shaft Site Pond Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Arsenic Concentration			Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00129	0.00128	0.00131	0.025	0.0523
	February	0.00129	0.00128	0.00131	0.025	0.0523
	March	0.00129	0.00128	0.00131	0.025	0.0523
	April	0.00129	0.00128	0.00131	0.025	0.0522
	May	0.00136	0.00137	0.00137	0.025	0.0548
	June	0.00136	0.00136	0.00136	0.025	0.0546
	July	0.00133	0.00132	0.00134	0.025	0.0535
	August	0.00130	0.00130	0.00131	0.025	0.0525
	September	0.00130	0.00130	0.00131	0.025	0.0525
	October	0.00130	0.00130	0.00131	0.025	0.0526
	November	0.00131	0.00130	0.00132	0.025	0.0526
	December	0.00131	0.00130	0.00132	0.025	0.0527
Operations (2018-2042)	January	0.00125	0.00125	0.00132	0.025	0.0527
	February	0.00125	0.00125	0.00132	0.025	0.0527
	March	0.00125	0.00125	0.00132	0.025	0.0527
	April	0.00125	0.00125	0.00132	0.025	0.0526
	May	0.00125	0.00126	0.00137	0.025	0.0547
	June	0.00125	0.00126	0.00137	0.025	0.0546
	July	0.00125	0.00125	0.00133	0.025	0.0534
	August	0.00125	0.00125	0.00132	0.025	0.0530
	September	0.00125	0.00125	0.00133	0.025	0.0530
	October	0.00125	0.00125	0.00133	0.025	0.0531
	November	0.00125	0.00125	0.00133	0.025	0.0531
	December	0.00125	0.00125	0.00133	0.025	0.0531
Closure (2043-2060)	January	0.00125	0.00125	0.00125	0.025	0.0500
	February	0.00125	0.00125	0.00125	0.025	0.0500
	March	0.00125	0.00125	0.00125	0.025	0.0500
	April	0.00125	0.00125	0.00125	0.025	0.0500
	May	0.00125	0.00125	0.00125	0.025	0.0500
	June	0.00125	0.00125	0.00125	0.025	0.0500
	July	0.00125	0.00125	0.00125	0.025	0.0500
	August	0.00125	0.00125	0.00125	0.025	0.0500
	September	0.00125	0.00125	0.00125	0.025	0.0500
	October	0.00125	0.00125	0.00125	0.025	0.0500
	November	0.00125	0.00125	0.00125	0.025	0.0500
	December	0.00125	0.00125	0.00125	0.025	0.0500

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2c. Shaft Site Pond Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Boron Concentration			Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.0154	0.0152	0.0158	5	0.00315
	February	0.0155	0.0153	0.0158	5	0.00316
	March	0.0155	0.0153	0.0159	5	0.00317
	April	0.0157	0.0155	0.0160	5	0.00320
	May	0.0155	0.0153	0.0158	5	0.00316
	June	0.0150	0.0149	0.0153	5	0.00306
	July	0.0153	0.0151	0.0156	5	0.00311
	August	0.0153	0.0152	0.0155	5	0.00310
	September	0.0155	0.0154	0.0157	5	0.00313
	October	0.0156	0.0155	0.0158	5	0.00315
	November	0.0157	0.0156	0.0158	5	0.00317
	December	0.0157	0.0157	0.0159	5	0.00317
Operations (2018-2042)	January	0.0151	0.0151	0.0159	5	0.00318
	February	0.0151	0.0151	0.0159	5	0.00319
	March	0.0151	0.0151	0.0160	5	0.00319
	April	0.0151	0.0151	0.0161	5	0.00321
	May	0.0151	0.0151	0.0159	5	0.00318
	June	0.0151	0.0151	0.0155	5	0.00311
	July	0.0151	0.0151	0.0156	5	0.00312
	August	0.0151	0.0151	0.0157	5	0.00314
	September	0.0151	0.0151	0.0158	5	0.00316
	October	0.0151	0.0151	0.0159	5	0.00318
	November	0.0151	0.0151	0.0160	5	0.00319
	December	0.0151	0.0151	0.0160	5	0.00320
Closure (2043-2060)	January	0.0151	0.0151	0.0151	5	0.00302
	February	0.0151	0.0151	0.0151	5	0.00302
	March	0.0151	0.0151	0.0151	5	0.00302
	April	0.0151	0.0151	0.0151	5	0.00302
	May	0.0151	0.0151	0.0151	5	0.00302
	June	0.0151	0.0151	0.0151	5	0.00302
	July	0.0151	0.0151	0.0151	5	0.00302
	August	0.0151	0.0151	0.0151	5	0.00302
	September	0.0151	0.0151	0.0151	5	0.00302
	October	0.0151	0.0151	0.0151	5	0.00302
	November	0.0151	0.0151	0.0151	5	0.00302
	December	0.0151	0.0151	0.0151	5	0.00302

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2d. Shaft Site Pond Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration			30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00425	0.00423	0.00430	0.3	0.0141
	February	0.00425	0.00423	0.00430	0.3	0.0141
	March	0.00425	0.00424	0.00431	0.3	0.0141
	April	0.00425	0.00423	0.00430	0.3	0.0141
	May	0.00449	0.00449	0.00450	0.3	0.0150
	June	0.00447	0.00447	0.00447	0.3	0.0149
	July	0.00436	0.00435	0.00439	0.3	0.0145
	August	0.00428	0.00427	0.00431	0.3	0.0142
	September	0.00429	0.00428	0.00432	0.3	0.0143
	October	0.00429	0.00428	0.00432	0.3	0.0143
	November	0.00430	0.00429	0.00433	0.3	0.0143
	December	0.00430	0.00429	0.00433	0.3	0.0143
Operations (2018-2042)	January	0.00411	0.00412	0.00433	0.3	0.0137
	February	0.00411	0.00412	0.00433	0.3	0.0137
	March	0.00411	0.00412	0.00434	0.3	0.0137
	April	0.00411	0.00412	0.00433	0.3	0.0137
	May	0.00411	0.00413	0.00449	0.3	0.0138
	June	0.00411	0.00412	0.00448	0.3	0.0137
	July	0.00411	0.00412	0.00438	0.3	0.0137
	August	0.00411	0.00412	0.00435	0.3	0.0137
	September	0.00411	0.00412	0.00436	0.3	0.0137
	October	0.00411	0.00412	0.00436	0.3	0.0137
	November	0.00411	0.00412	0.00436	0.3	0.0137
	December	0.00411	0.00412	0.00436	0.3	0.0137
Closure (2043-2060)	January	0.00411	0.00411	0.00411	0.3	0.0137
	February	0.00411	0.00411	0.00411	0.3	0.0137
	March	0.00411	0.00411	0.00411	0.3	0.0137
	April	0.00411	0.00411	0.00411	0.3	0.0137
	May	0.00411	0.00411	0.00411	0.3	0.0137
	June	0.00411	0.00411	0.00411	0.3	0.0137
	July	0.00411	0.00411	0.00411	0.3	0.0137
	August	0.00411	0.00411	0.00411	0.3	0.0137
	September	0.00411	0.00411	0.00411	0.3	0.0137
	October	0.00411	0.00411	0.00411	0.3	0.0137
	November	0.00411	0.00411	0.00411	0.3	0.0137
	December	0.00411	0.00411	0.00411	0.3	0.0137

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2e. Shaft Site Pond Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration			BC MOE 30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00170	0.00169	0.00171	0.1	0.0169
	February	0.00170	0.00169	0.00171	0.1	0.0169
	March	0.00170	0.00169	0.00171	0.1	0.0169
	April	0.00168	0.00168	0.00170	0.1	0.0168
	May	0.00181	0.00182	0.00184	0.1	0.0182
	June	0.00182	0.00183	0.00185	0.1	0.0183
	July	0.00176	0.00176	0.00177	0.1	0.0176
	August	0.00172	0.00172	0.00173	0.1	0.0172
	September	0.00171	0.00171	0.00172	0.1	0.0171
	October	0.00171	0.00171	0.00172	0.1	0.0171
	November	0.00171	0.00171	0.00172	0.1	0.0171
	December	0.00171	0.00171	0.00172	0.1	0.0171
Operations (2018-2042)	January	0.00163	0.00164	0.00172	0.1	0.0164
	February	0.00163	0.00164	0.00172	0.1	0.0164
	March	0.00163	0.00164	0.00172	0.1	0.0164
	April	0.00163	0.00164	0.00172	0.1	0.0164
	May	0.00163	0.00164	0.00180	0.1	0.0164
	June	0.00163	0.00164	0.00181	0.1	0.0164
	July	0.00163	0.00164	0.00176	0.1	0.0164
	August	0.00163	0.00164	0.00174	0.1	0.0164
	September	0.00163	0.00164	0.00174	0.1	0.0164
	October	0.00163	0.00164	0.00174	0.1	0.0164
	November	0.00163	0.00164	0.00174	0.1	0.0164
	December	0.00163	0.00164	0.00174	0.1	0.0164
Closure (2043-2060)	January	0.00163	0.00163	0.00163	0.1	0.0163
	February	0.00163	0.00163	0.00163	0.1	0.0163
	March	0.00163	0.00163	0.00163	0.1	0.0163
	April	0.00163	0.00163	0.00163	0.1	0.0163
	May	0.00163	0.00163	0.00163	0.1	0.0163
	June	0.00163	0.00163	0.00163	0.1	0.0163
	July	0.00163	0.00163	0.00163	0.1	0.0163
	August	0.00163	0.00163	0.00163	0.1	0.0163
	September	0.00163	0.00163	0.00163	0.1	0.0163
	October	0.00163	0.00163	0.00163	0.1	0.0163
	November	0.00163	0.00163	0.00163	0.1	0.0163
	December	0.00163	0.00163	0.00163	0.1	0.0163

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2f. Shaft Site Pond Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			BC MOE 30-Day Mean if MeHg is 0.5% of THg	Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.0000180	0.0000177	0.0000185	0.00002	0.886
	February	0.0000181	0.0000178	0.0000186	0.00002	0.889
	March	0.0000181	0.0000178	0.0000186	0.00002	0.892
	April	0.0000182	0.0000179	0.0000186	0.00002	0.894
	May	0.0000185	0.0000183	0.0000189	0.00002	0.917
	June	0.0000183	0.0000181	0.0000186	0.00002	0.907
	July	0.0000182	0.0000181	0.0000186	0.00002	0.905
	August	0.0000181	0.0000180	0.0000184	0.00002	0.899
	September	0.0000182	0.0000181	0.0000185	0.00002	0.905
	October	0.0000183	0.0000182	0.0000186	0.00002	0.911
	November	0.0000184	0.0000183	0.0000187	0.00002	0.916
	December	0.0000185	0.0000184	0.0000187	0.00002	0.919
Operations (2018-2042)	January	0.0000177	0.0000178	0.0000189	0.00002	0.889
	February	0.0000177	0.0000178	0.0000190	0.00002	0.889
	March	0.0000177	0.0000178	0.0000190	0.00002	0.889
	April	0.0000177	0.0000178	0.0000188	0.00002	0.888
	May	0.0000177	0.0000177	0.0000190	0.00002	0.887
	June	0.0000177	0.0000177	0.0000188	0.00002	0.887
	July	0.0000177	0.0000177	0.0000186	0.00002	0.886
	August	0.0000177	0.0000177	0.0000186	0.00002	0.886
	September	0.0000177	0.0000177	0.0000187	0.00002	0.887
	October	0.0000177	0.0000177	0.0000188	0.00002	0.887
	November	0.0000177	0.0000177	0.0000189	0.00002	0.887
	December	0.0000177	0.0000177	0.0000189	0.00002	0.887
Closure (2043-2060)	January	0.0000177	0.0000177	0.0000177	0.00002	0.885
	February	0.0000177	0.0000177	0.0000177	0.00002	0.885
	March	0.0000177	0.0000177	0.0000177	0.00002	0.885
	April	0.0000177	0.0000177	0.0000177	0.00002	0.885
	May	0.0000177	0.0000177	0.0000177	0.00002	0.885
	June	0.0000177	0.0000177	0.0000177	0.00002	0.885
	July	0.0000177	0.0000177	0.0000177	0.00002	0.885
	August	0.0000177	0.0000177	0.0000177	0.00002	0.885
	September	0.0000177	0.0000177	0.0000177	0.00002	0.885
	October	0.0000177	0.0000177	0.0000177	0.00002	0.885
	November	0.0000177	0.0000177	0.0000177	0.00002	0.885
	December	0.0000177	0.0000177	0.0000177	0.00002	0.885

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2g. Shaft Site Pond Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration				
		Median	Mean	Maximum	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.00159	0.00155	0.00165	0.05	0.0329
	February	0.00160	0.00156	0.00165	0.05	0.0330
	March	0.00161	0.00157	0.00166	0.05	0.0331
	April	0.00162	0.00158	0.00167	0.05	0.0334
	May	0.00157	0.00155	0.00163	0.05	0.0326
	June	0.00153	0.00151	0.00158	0.05	0.0316
	July	0.00157	0.00155	0.00162	0.05	0.0323
	August	0.00158	0.00157	0.00162	0.05	0.0323
	September	0.00160	0.00159	0.00163	0.05	0.0326
	October	0.00162	0.00160	0.00165	0.05	0.0329
	November	0.00163	0.00162	0.00166	0.05	0.0331
	December	0.00164	0.00163	0.00166	0.05	0.0333
Operations (2018-2042)	January	0.00159	0.00159	0.00167	0.05	0.0334
	February	0.00159	0.00159	0.00167	0.05	0.0335
	March	0.00159	0.00159	0.00168	0.05	0.0336
	April	0.00159	0.00159	0.00169	0.05	0.0337
	May	0.00159	0.00159	0.00165	0.05	0.0331
	June	0.00159	0.00159	0.00161	0.05	0.0322
	July	0.00159	0.00159	0.00163	0.05	0.0325
	August	0.00159	0.00159	0.00164	0.05	0.0328
	September	0.00159	0.00159	0.00165	0.05	0.0331
	October	0.00159	0.00159	0.00167	0.05	0.0333
	November	0.00159	0.00159	0.00168	0.05	0.0335
	December	0.00159	0.00159	0.00168	0.05	0.0336
Closure (2043-2060)	January	0.00159	0.00159	0.00159	0.05	0.0317
	February	0.00159	0.00159	0.00159	0.05	0.0317
	March	0.00159	0.00159	0.00159	0.05	0.0317
	April	0.00159	0.00159	0.00159	0.05	0.0317
	May	0.00159	0.00159	0.00159	0.05	0.0317
	June	0.00159	0.00159	0.00159	0.05	0.0317
	July	0.00159	0.00159	0.00159	0.05	0.0317
	August	0.00159	0.00159	0.00159	0.05	0.0317
	September	0.00159	0.00159	0.00159	0.05	0.0317
	October	0.00159	0.00159	0.00159	0.05	0.0317
	November	0.00159	0.00159	0.00159	0.05	0.0317
	December	0.00159	0.00159	0.00159	0.05	0.0317

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2h. Shaft Site Pond Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Selenium Concentration				
		Median	Mean	Maximum	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.00105	0.00104	0.00107	0.002	0.536
	February	0.00106	0.00104	0.00107	0.002	0.537
	March	0.00106	0.00105	0.00108	0.002	0.539
	April	0.00107	0.00106	0.00108	0.002	0.542
	May	0.00104	0.00103	0.00106	0.002	0.531
	June	0.00101	0.00100	0.00103	0.002	0.515
	July	0.00104	0.00103	0.00105	0.002	0.527
	August	0.00104	0.00103	0.00105	0.002	0.526
	September	0.00105	0.00105	0.00106	0.002	0.531
	October	0.00106	0.00105	0.00107	0.002	0.534
	November	0.00107	0.00106	0.00107	0.002	0.537
	December	0.00107	0.00107	0.00108	0.002	0.538
Operations (2018-2042)	January	0.00102	0.00102	0.00108	0.002	0.540
	February	0.00102	0.00102	0.00108	0.002	0.541
	March	0.00102	0.00102	0.00108	0.002	0.542
	April	0.00102	0.00102	0.00109	0.002	0.544
	May	0.00102	0.00102	0.00107	0.002	0.535
	June	0.00102	0.00102	0.00104	0.002	0.522
	July	0.00102	0.00102	0.00106	0.002	0.528
	August	0.00102	0.00102	0.00106	0.002	0.532
	September	0.00102	0.00102	0.00107	0.002	0.536
	October	0.00102	0.00102	0.00108	0.002	0.538
	November	0.00102	0.00102	0.00108	0.002	0.541
	December	0.00102	0.00102	0.00108	0.002	0.542
Closure (2043-2060)	January	0.00102	0.00102	0.00102	0.002	0.511
	February	0.00102	0.00102	0.00102	0.002	0.511
	March	0.00102	0.00102	0.00102	0.002	0.511
	April	0.00102	0.00102	0.00102	0.002	0.511
	May	0.00102	0.00102	0.00102	0.002	0.511
	June	0.00102	0.00102	0.00102	0.002	0.511
	July	0.00102	0.00102	0.00102	0.002	0.511
	August	0.00102	0.00102	0.00102	0.002	0.511
	September	0.00102	0.00102	0.00102	0.002	0.511
	October	0.00102	0.00102	0.00102	0.002	0.511
	November	0.00102	0.00102	0.00102	0.002	0.511
	December	0.00102	0.00102	0.00102	0.002	0.511

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2i. Shaft Site Pond Hazard Quotients for Chloride, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Chloride Concentration				
		Median	Mean	Maximum	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.894	0.873	0.926	600	0.00154
	February	0.899	0.878	0.930	600	0.00155
	March	0.903	0.883	0.933	600	0.00155
	April	0.927	0.909	0.951	600	0.00158
	May	0.908	0.895	0.936	600	0.00156
	June	0.867	0.856	0.896	600	0.00149
	July	0.884	0.874	0.910	600	0.00152
	August	0.888	0.880	0.909	600	0.00152
	September	0.900	0.893	0.919	600	0.00153
	October	0.910	0.903	0.926	600	0.00154
	November	0.918	0.912	0.933	600	0.00156
	December	0.923	0.916	0.937	600	0.00156
Operations (2018-2042)	January	0.894	0.897	0.940	600	0.00157
	February	0.894	0.896	0.942	600	0.00157
	March	0.894	0.896	0.945	600	0.00158
	April	0.894	0.897	0.959	600	0.00160
	May	0.894	0.896	0.947	600	0.00158
	June	0.894	0.895	0.913	600	0.00152
	July	0.894	0.895	0.917	600	0.00153
	August	0.894	0.895	0.924	600	0.00154
	September	0.894	0.896	0.932	600	0.00155
	October	0.894	0.896	0.939	600	0.00156
	November	0.894	0.896	0.945	600	0.00157
	December	0.894	0.896	0.948	600	0.00158
Closure (2043-2060)	January	0.894	0.894	0.894	600	0.00149
	February	0.894	0.894	0.894	600	0.00149
	March	0.894	0.894	0.894	600	0.00149
	April	0.894	0.894	0.894	600	0.00149
	May	0.894	0.894	0.894	600	0.00149
	June	0.894	0.894	0.894	600	0.00149
	July	0.894	0.894	0.894	600	0.00149
	August	0.894	0.894	0.894	600	0.00149
	September	0.894	0.894	0.894	600	0.00149
	October	0.894	0.894	0.894	600	0.00149
	November	0.894	0.894	0.894	600	0.00149
	December	0.894	0.894	0.894	600	0.00149

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G2j. Shaft Site Pond Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Chloride Concentration			30-Day Mean	Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0664	0.0656	0.0675	1	1.5	0.0656	0.0450
	February	0.0666	0.0658	0.0677	1	1.5	0.0658	0.0451
	March	0.0668	0.0660	0.0678	1	1.5	0.0660	0.0452
	April	0.0685	0.0678	0.0691	1	1.5	0.0678	0.0460
	May	0.0669	0.0664	0.0680	1	1.5	0.0664	0.0454
	June	0.0637	0.0632	0.0651	1	1.5	0.0632	0.0434
	July	0.0649	0.0645	0.0662	1	1.5	0.0645	0.0441
	August	0.0653	0.0650	0.0662	1	1.5	0.0650	0.0441
	September	0.0662	0.0659	0.0669	1	1.5	0.0659	0.0446
	October	0.0667	0.0664	0.0673	1	1.5	0.0664	0.0449
	November	0.0671	0.0669	0.0677	1	1.5	0.0669	0.0451
	December	0.0674	0.0671	0.0678	1	1.5	0.0671	0.0452
Operations (2018-2042)	January	0.0644	0.0646	0.0680	1	1.5	0.0646	0.0453
	February	0.0644	0.0645	0.0681	1	1.5	0.0645	0.0454
	March	0.0644	0.0645	0.0682	1	1.5	0.0645	0.0455
	April	0.0644	0.0646	0.0692	1	1.5	0.0646	0.0461
	May	0.0644	0.0645	0.0683	1	1.5	0.0645	0.0456
	June	0.0644	0.0645	0.0660	1	1.5	0.0645	0.0440
	July	0.0644	0.0645	0.0663	1	1.5	0.0645	0.0442
	August	0.0644	0.0645	0.0669	1	1.5	0.0645	0.0446
	September	0.0644	0.0645	0.0675	1	1.5	0.0645	0.0450
	October	0.0644	0.0645	0.0678	1	1.5	0.0645	0.0452
	November	0.0644	0.0645	0.0681	1	1.5	0.0645	0.0454
	December	0.0644	0.0645	0.0683	1	1.5	0.0645	0.0455
Closure (2043-2060)	January	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	February	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	March	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	April	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	May	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	June	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	July	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	August	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	September	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	October	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	November	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429
	December	0.0644	0.0644	0.0644	1	1.5	0.0644	0.0429

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

Appendix 8-G3
Coal Processing Plant Pond

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G3a. Coal Processing Plant Pond Hazard Quotients for Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Aluminum Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.253	0.181	0.260	5	0.0363
	February	0.260	0.180	0.262	5	0.0360
	March	0.261	0.183	0.262	5	0.0366
	April	0.222	0.196	0.238	5	0.0393
	May	0.136	0.144	0.169	5	0.0288
	June	0.122	0.124	0.160	5	0.0247
	July	0.230	0.247	0.301	5	0.0495
	August	0.201	0.198	0.238	5	0.0396
	September	0.271	0.272	0.284	5	0.0545
	October	0.159	0.165	0.256	5	0.0331
	November	0.154	0.169	0.258	5	0.0339
	December	0.0966	0.130	0.260	5	0.0261
Operations (2018-2042)	January	0.212	0.236	0.390	5	0.0472
	February	0.206	0.232	0.390	5	0.0464
	March	0.211	0.236	0.391	5	0.0473
	April	0.285	0.288	0.380	5	0.0575
	May	0.269	0.283	0.380	5	0.0567
	June	0.300	0.291	0.347	5	0.0583
	July	0.362	0.357	0.379	5	0.0714
	August	0.291	0.298	0.382	5	0.0597
	September	0.344	0.343	0.391	5	0.0686
	October	0.243	0.266	0.388	5	0.0533
	November	0.250	0.272	0.389	5	0.0544
	December	0.219	0.250	0.390	5	0.0500
Closure (2043-2060)	January	0.156	0.156	0.156	5	0.0312
	February	0.156	0.156	0.156	5	0.0312
	March	0.156	0.156	0.156	5	0.0312
	April	0.156	0.156	0.156	5	0.0312
	May	0.156	0.156	0.156	5	0.0312
	June	0.156	0.156	0.156	5	0.0312
	July	0.156	0.156	0.156	5	0.0312
	August	0.156	0.156	0.156	5	0.0312
	September	0.156	0.156	0.156	5	0.0312
	October	0.156	0.156	0.156	5	0.0312
	November	0.156	0.156	0.156	5	0.0312
	December	0.156	0.156	0.156	5	0.0312

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3b. Coal Processing Plant Pond Hazard Quotients for Total Arsenic, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Arsenic Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00291	0.00204	0.00300	0.025	0.120
	February	0.00301	0.00206	0.00301	0.025	0.120
	March	0.00301	0.00205	0.00302	0.025	0.121
	April	0.00228	0.00165	0.00247	0.025	0.0989
	May	0.000949	0.000810	0.00127	0.025	0.0506
	June	0.00138	0.00113	0.00181	0.025	0.0724
	July	0.00220	0.00171	0.00266	0.025	0.106
	August	0.00195	0.00164	0.00275	0.025	0.110
	September	0.00172	0.00166	0.00302	0.025	0.121
	October	0.00144	0.00152	0.00295	0.025	0.118
	November	0.00120	0.00145	0.00298	0.025	0.119
	December	0.000938	0.00136	0.00300	0.025	0.120
Operations (2018-2042)	January	0.00218	0.00247	0.00422	0.025	0.169
	February	0.00216	0.00246	0.00422	0.025	0.169
	March	0.00216	0.00247	0.00422	0.025	0.169
	April	0.00250	0.00264	0.00405	0.025	0.162
	May	0.00231	0.00254	0.00412	0.025	0.165
	June	0.00319	0.00286	0.00378	0.025	0.151
	July	0.00244	0.00267	0.00412	0.025	0.165
	August	0.00235	0.00263	0.00415	0.025	0.166
	September	0.00223	0.00258	0.00423	0.025	0.169
	October	0.00222	0.00258	0.00420	0.025	0.168
	November	0.00221	0.00259	0.00421	0.025	0.168
	December	0.00220	0.00259	0.00422	0.025	0.169
Closure (2043-2060)	January	0.00170	0.00170	0.00170	0.025	0.0681
	February	0.00170	0.00170	0.00170	0.025	0.0681
	March	0.00170	0.00170	0.00170	0.025	0.0681
	April	0.00170	0.00170	0.00170	0.025	0.0681
	May	0.00170	0.00170	0.00170	0.025	0.0681
	June	0.00170	0.00170	0.00170	0.025	0.0681
	July	0.00170	0.00170	0.00170	0.025	0.0681
	August	0.00170	0.00170	0.00170	0.025	0.0681
	September	0.00170	0.00170	0.00170	0.025	0.0681
	October	0.00170	0.00170	0.00170	0.025	0.0681
	November	0.00170	0.00170	0.00170	0.025	0.0681
	December	0.00170	0.00170	0.00170	0.025	0.0681

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3c. Coal Processing Plant Pond Hazard Quotients for Total Boron, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply		
		Total Boron Concentration					Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.242	0.168	0.250	5	0.0499		
	February	0.250	0.171	0.250	5	0.0500		
	March	0.251	0.171	0.251	5	0.0502		
	April	0.188	0.135	0.204	5	0.0408		
	May	0.0754	0.0626	0.101	5	0.0203		
	June	0.113	0.0906	0.149	5	0.0298		
	July	0.182	0.138	0.220	5	0.0440		
	August	0.160	0.132	0.229	5	0.0458		
	September	0.137	0.131	0.251	5	0.0502		
	October	0.116	0.122	0.245	5	0.0491		
	November	0.0975	0.119	0.248	5	0.0496		
	December	0.0782	0.113	0.249	5	0.0499		
Operations (2018-2042)	January	0.154	0.177	0.300	5	0.0600		
	February	0.156	0.178	0.301	5	0.0601		
	March	0.158	0.179	0.301	5	0.0602		
	April	0.175	0.191	0.288	5	0.0576		
	May	0.167	0.188	0.307	5	0.0613		
	June	0.227	0.207	0.269	5	0.0539		
	July	0.172	0.191	0.293	5	0.0586		
	August	0.164	0.187	0.295	5	0.0590		
	September	0.152	0.182	0.301	5	0.0602		
	October	0.154	0.184	0.299	5	0.0599		
	November	0.156	0.186	0.300	5	0.0600		
	December	0.157	0.188	0.300	5	0.0600		
Closure (2043-2060)	January	0.121	0.121	0.121	5	0.0243		
	February	0.121	0.121	0.121	5	0.0243		
	March	0.121	0.121	0.121	5	0.0243		
	April	0.121	0.121	0.121	5	0.0243		
	May	0.121	0.121	0.121	5	0.0243		
	June	0.121	0.121	0.121	5	0.0243		
	July	0.121	0.121	0.121	5	0.0243		
	August	0.121	0.121	0.121	5	0.0243		
	September	0.121	0.121	0.121	5	0.0243		
	October	0.121	0.121	0.121	5	0.0243		
	November	0.121	0.121	0.121	5	0.0243		
	December	0.121	0.121	0.121	5	0.0243		

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3d. Coal Processing Plant Pond Hazard Quotients for Total Copper, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00246	0.00175	0.00253	0.3	0.00584
	February	0.00253	0.00178	0.00254	0.3	0.00592
	March	0.00254	0.00178	0.00255	0.3	0.00594
	April	0.00202	0.00152	0.00218	0.3	0.00507
	May	0.00101	0.00097	0.00130	0.3	0.00324
	June	0.00129	0.00117	0.00165	0.3	0.00388
	July	0.00194	0.00165	0.00228	0.3	0.00551
	August	0.00167	0.00143	0.00233	0.3	0.00475
	September	0.00160	0.00155	0.00255	0.3	0.00517
	October	0.00129	0.00135	0.00250	0.3	0.00451
	November	0.00121	0.00139	0.00252	0.3	0.00464
	December	0.00107	0.00138	0.00253	0.3	0.00459
Operations (2018-2042)	January	0.00287	0.00314	0.00520	0.3	0.0105
	February	0.00287	0.00315	0.00522	0.3	0.0105
	March	0.00288	0.00316	0.00523	0.3	0.0105
	April	0.00335	0.00339	0.00506	0.3	0.0113
	May	0.00321	0.00367	0.00622	0.3	0.0122
	June	0.00427	0.00374	0.00461	0.3	0.0125
	July	0.00344	0.00355	0.00511	0.3	0.0118
	August	0.00313	0.00334	0.00514	0.3	0.0111
	September	0.00307	0.00336	0.00522	0.3	0.0112
	October	0.00297	0.00330	0.00519	0.3	0.0110
	November	0.00305	0.00337	0.00519	0.3	0.0112
	December	0.00308	0.00341	0.00520	0.3	0.0114
Closure (2043-2060)	January	0.00204	0.00204	0.00204	0.3	0.00679
	February	0.00204	0.00204	0.00204	0.3	0.00679
	March	0.00204	0.00204	0.00204	0.3	0.00679
	April	0.00204	0.00204	0.00204	0.3	0.00679
	May	0.00204	0.00204	0.00204	0.3	0.00679
	June	0.00204	0.00204	0.00204	0.3	0.00679
	July	0.00204	0.00204	0.00204	0.3	0.00679
	August	0.00204	0.00204	0.00204	0.3	0.00679
	September	0.00204	0.00204	0.00204	0.3	0.00679
	October	0.00204	0.00204	0.00204	0.3	0.00679
	November	0.00204	0.00204	0.00204	0.3	0.00679
	December	0.00204	0.00204	0.00204	0.3	0.00679

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3e. Coal Processing Plant Pond Hazard Quotients for Total Lead, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration				
		Median	Mean	Maximum	30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.00126	0.000860	0.00130	0.1	0.00860
	February	0.00130	0.000875	0.00130	0.1	0.00875
	March	0.00130	0.000878	0.00131	0.1	0.00878
	April	0.00100	0.000732	0.00108	0.1	0.00732
	May	0.000415	0.000357	0.000552	0.1	0.00357
	June	0.000574	0.000474	0.000762	0.1	0.00474
	July	0.000954	0.000789	0.00114	0.1	0.00789
	August	0.000848	0.000723	0.00118	0.1	0.00723
	September	0.000791	0.000764	0.00131	0.1	0.00764
	October	0.000622	0.000655	0.00128	0.1	0.00655
	November	0.000555	0.000658	0.00129	0.1	0.00658
	December	0.000381	0.000570	0.00130	0.1	0.00570
Operations (2018-2042)	January	0.000778	0.000896	0.00151	0.1	0.00896
	February	0.000785	0.000901	0.00151	0.1	0.00901
	March	0.000793	0.000906	0.00151	0.1	0.00906
	April	0.000921	0.000993	0.00145	0.1	0.00993
	May	0.000853	0.000874	0.00120	0.1	0.00874
	June	0.00113	0.00106	0.00134	0.1	0.0106
	July	0.000984	0.00106	0.00147	0.1	0.0106
	August	0.000891	0.000998	0.00148	0.1	0.00998
	September	0.000873	0.00100	0.00151	0.1	0.0100
	October	0.000817	0.000959	0.00150	0.1	0.00959
	November	0.000846	0.000985	0.00151	0.1	0.00985
	December	0.000797	0.000950	0.00151	0.1	0.00950
Closure (2043-2060)	January	0.000610	0.000610	0.000610	0.1	0.00610
	February	0.000610	0.000610	0.000610	0.1	0.00610
	March	0.000610	0.000610	0.000610	0.1	0.00610
	April	0.000610	0.000610	0.000610	0.1	0.00610
	May	0.000610	0.000610	0.000610	0.1	0.00610
	June	0.000610	0.000610	0.000610	0.1	0.00610
	July	0.000610	0.000610	0.000610	0.1	0.00610
	August	0.000610	0.000610	0.000610	0.1	0.00610
	September	0.000610	0.000610	0.000610	0.1	0.00610
	October	0.000610	0.000610	0.000610	0.1	0.00610
	November	0.000610	0.000610	0.000610	0.1	0.00610
	December	0.000610	0.000610	0.000610	0.1	0.00610

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3f. Coal Processing Plant Pond Hazard Quotients for Total Mercury, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			30-Day Mean if MeHg is 0.5% of THg	Mean Guideline if MeHg is 0.5% of THg
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00000750	0.0000212	0.0000499	0.00002	0.106
	February	0.00000757	0.0000212	0.0000500	0.00002	0.106
	March	0.00000746	0.0000212	0.0000502	0.00002	0.106
	April	0.00000134	0.0000246	0.0000483	0.00002	0.123
	May	0.00000254	0.0000295	0.0000409	0.00002	0.148
	June	0.00000195	0.0000275	0.0000442	0.00002	0.137
	July	0.00000141	0.0000250	0.0000499	0.00002	0.125
	August	0.00000192	0.0000263	0.0000500	0.00002	0.132
	September	0.00000263	0.0000278	0.0000505	0.00002	0.139
	October	0.00000291	0.0000287	0.0000499	0.00002	0.143
	November	0.00000333	0.0000299	0.0000499	0.00002	0.150
	December	0.00000375	0.0000312	0.0000499	0.00002	0.156
Operations (2018-2042)	January	0.0000277	0.0000258	0.0000325	0.00002	1.29
	February	0.0000275	0.0000258	0.0000325	0.00002	1.29
	March	0.0000276	0.0000259	0.0000324	0.00002	1.29
	April	0.0000294	0.0000275	0.0000343	0.00002	1.37
	May	0.0000231	0.0000245	0.0000319	0.00002	1.22
	June	0.0000318	0.0000299	0.0000370	0.00002	1.49
	July	0.0000289	0.0000272	0.0000337	0.00002	1.36
	August	0.0000285	0.0000270	0.0000330	0.00002	1.35
	September	0.0000277	0.0000263	0.0000323	0.00002	1.32
	October	0.0000277	0.0000265	0.0000326	0.00002	1.32
	November	0.0000275	0.0000265	0.0000325	0.00002	1.32
	December	0.0000278	0.0000265	0.0000324	0.00002	1.32
Closure (2043-2060)	January	0.0000102	0.0000102	0.0000102	0.00002	0.508
	February	0.0000102	0.0000102	0.0000102	0.00002	0.508
	March	0.0000102	0.0000102	0.0000102	0.00002	0.508
	April	0.0000102	0.0000102	0.0000102	0.00002	0.508
	May	0.0000102	0.0000102	0.0000102	0.00002	0.508
	June	0.0000102	0.0000102	0.0000102	0.00002	0.508
	July	0.0000102	0.0000102	0.0000102	0.00002	0.508
	August	0.0000102	0.0000102	0.0000102	0.00002	0.508
	September	0.0000102	0.0000102	0.0000102	0.00002	0.508
	October	0.0000102	0.0000102	0.0000102	0.00002	0.508
	November	0.0000102	0.0000102	0.0000102	0.00002	0.508
	December	0.0000102	0.0000102	0.0000102	0.00002	0.508

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3g. Coal Processing Plant Pond Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.0209	0.0145	0.0216	0.05	0.432
	February	0.0216	0.0147	0.0217	0.05	0.433
	March	0.0217	0.0148	0.0217	0.05	0.435
	April	0.0162	0.0115	0.0175	0.05	0.350
	May	0.00615	0.00491	0.00836	0.05	0.167
	June	0.0094	0.0074	0.0126	0.05	0.251
	July	0.0155	0.0117	0.0189	0.05	0.379
	August	0.0137	0.0113	0.0197	0.05	0.394
	September	0.0119	0.0114	0.0217	0.05	0.435
	October	0.0101	0.0106	0.0212	0.05	0.424
	November	0.00833	0.0102	0.0215	0.05	0.429
	December	0.00654	0.00964	0.0216	0.05	0.432
Operations (2018-2042)	January	0.0181	0.0204	0.0360	0.05	0.721
	February	0.0182	0.0205	0.0361	0.05	0.721
	March	0.0182	0.0206	0.0361	0.05	0.722
	April	0.0212	0.0219	0.0344	0.05	0.689
	May	0.0188	0.0217	0.0383	0.05	0.767
	June	0.0266	0.0236	0.0320	0.05	0.640
	July	0.0204	0.0218	0.0351	0.05	0.701
	August	0.0198	0.0216	0.0354	0.05	0.707
	September	0.0184	0.0211	0.0361	0.05	0.722
	October	0.0185	0.0214	0.0359	0.05	0.718
	November	0.0185	0.0215	0.0360	0.05	0.720
	December	0.0185	0.0216	0.0360	0.05	0.720
Closure (2043-2060)	January	0.0144	0.0144	0.0144	0.05	0.287
	February	0.0144	0.0144	0.0144	0.05	0.287
	March	0.0144	0.0144	0.0144	0.05	0.287
	April	0.0144	0.0144	0.0144	0.05	0.287
	May	0.0144	0.0144	0.0144	0.05	0.287
	June	0.0144	0.0144	0.0144	0.05	0.287
	July	0.0144	0.0144	0.0144	0.05	0.287
	August	0.0144	0.0144	0.0144	0.05	0.287
	September	0.0144	0.0144	0.0144	0.05	0.287
	October	0.0144	0.0144	0.0144	0.05	0.287
	November	0.0144	0.0144	0.0144	0.05	0.287
	December	0.0144	0.0144	0.0144	0.05	0.287

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3h. Coal Processing Plant Pond Hazard Quotients for Total Selenium, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply		
		Total Selenium Concentration					Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00245	0.00175	0.00253	0.002	1.26		
	February	0.00253	0.00178	0.00254	0.002	1.27		
	March	0.00254	0.00178	0.00255	0.002	1.27		
	April	0.00195	0.00146	0.00211	0.002	1.06		
	May	0.000849	0.000751	0.00112	0.002	0.561		
	June	0.00122	0.00103	0.00159	0.002	0.794		
	July	0.00188	0.00144	0.00226	0.002	1.13		
	August	0.00165	0.00139	0.00234	0.002	1.17		
	September	0.00142	0.00137	0.00255	0.002	1.27		
	October	0.00123	0.00130	0.00249	0.002	1.24		
	November	0.00105	0.00126	0.00251	0.002	1.26		
	December	0.000855	0.00120	0.00253	0.002	1.26		
Operations (2018-2042)	January	0.00740	0.00788	0.0146	0.002	7.28		
	February	0.00741	0.00791	0.0146	0.002	7.32		
	March	0.00744	0.00796	0.0146	0.002	7.32		
	April	0.00873	0.00853	0.0140	0.002	7.02		
	May	0.00790	0.0102	0.0210	0.002	10.5		
	June	0.0112	0.00934	0.0129	0.002	6.43		
	July	0.00837	0.00850	0.0144	0.002	7.19		
	August	0.00809	0.00840	0.0145	0.002	7.23		
	September	0.00753	0.00818	0.0146	0.002	7.31		
	October	0.00759	0.00829	0.0145	0.002	7.27		
	November	0.00757	0.00831	0.0145	0.002	7.27		
	December	0.00760	0.00834	0.0145	0.002	7.27		
Closure (2043-2060)	January	0.00553	0.00553	0.00553	0.002	2.76		
	February	0.00553	0.00553	0.00553	0.002	2.76		
	March	0.00553	0.00553	0.00553	0.002	2.76		
	April	0.00553	0.00553	0.00553	0.002	2.76		
	May	0.00553	0.00553	0.00553	0.002	2.76		
	June	0.00553	0.00553	0.00553	0.002	2.76		
	July	0.00553	0.00553	0.00553	0.002	2.76		
	August	0.00553	0.00553	0.00553	0.002	2.76		
	September	0.00553	0.00553	0.00553	0.002	2.76		
	October	0.00553	0.00553	0.00553	0.002	2.76		
	November	0.00553	0.00553	0.00553	0.002	2.76		
	December	0.00553	0.00553	0.00553	0.002	2.76		

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3i. Coal Processing Plant Pond Hazard Quotients for Total Chloride, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Chloride Concentration				
		Median	Mean	Maximum		
Construction (2015-2017)	January	76.9	52.7	79.5	600	0.132
	February	79.5	53.6	79.6	600	0.133
	March	79.8	53.9	79.9	600	0.133
	April	59.8	42.2	64.8	600	0.108
	May	23.0	18.5	31.1	600	0.052
	June	35.1	27.7	46.6	600	0.078
	July	57.1	42.4	69.6	600	0.116
	August	50.2	41.2	72.6	600	0.121
	September	43.1	41.2	79.9	600	0.133
	October	36.3	38.4	78.1	600	0.130
	November	29.6	36.6	78.9	600	0.131
	December	22.8	34.4	79.3	600	0.132
Operations (2018-2042)	January	43.4	50.6	85.8	600	0.143
	February	43.5	50.8	85.8	600	0.143
	March	44.1	51.3	85.9	600	0.143
	April	49.7	54.4	82.4	600	0.137
	May	45.7	46.3	65.5	600	0.109
	June	63.2	58.2	76.6	600	0.128
	July	47.7	53.8	83.7	600	0.139
	August	46.1	53.5	84.3	600	0.141
	September	43.6	52.3	85.9	600	0.143
	October	44.1	52.8	85.5	600	0.142
	November	44.2	53.1	85.6	600	0.143
	December	44.2	53.3	85.7	600	0.143
Closure (2043-2060)	January	35.0	35.0	35.0	600	0.0583
	February	35.0	35.0	35.0	600	0.0583
	March	35.0	35.0	35.0	600	0.0583
	April	35.0	35.0	35.0	600	0.0583
	May	35.0	35.0	35.0	600	0.0583
	June	35.0	35.0	35.0	600	0.0583
	July	35.0	35.0	35.0	600	0.0583
	August	35.0	35.0	35.0	600	0.0583
	September	35.0	35.0	35.0	600	0.0583
	October	35.0	35.0	35.0	600	0.0583
	November	35.0	35.0	35.0	600	0.0583
	December	35.0	35.0	35.0	600	0.0583

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G3j. Coal Processing Plant Pond Hazard Quotients for Total Fluoride, Base Case

Project Phase	Months	Predicted Water Quality			BC MOE Working Water Quality Guidelines for Wildlife Water Supply		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Total Fluoride Concentration			30-Day Mean	Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.620	0.438	0.640	1	1.5	0.438	0.427
	February	0.640	0.447	0.641	1	1.5	0.447	0.428
	March	0.642	0.447	0.644	1	1.5	0.447	0.429
	April	0.490	0.360	0.530	1	1.5	0.360	0.353
	May	0.216	0.191	0.285	1	1.5	0.191	0.190
	June	0.308	0.258	0.400	1	1.5	0.258	0.266
	July	0.483	0.371	0.577	1	1.5	0.371	0.384
	August	0.438	0.368	0.605	1	1.5	0.368	0.404
	September	0.361	0.346	0.644	1	1.5	0.346	0.429
	October	0.311	0.327	0.630	1	1.5	0.327	0.420
	November	0.261	0.314	0.636	1	1.5	0.314	0.424
	December	0.211	0.299	0.639	1	1.5	0.299	0.426
Operations (2018-2042)	January	0.493	0.555	0.940	1	1.5	0.555	0.627
	February	0.497	0.559	0.943	1	1.5	0.559	0.629
	March	0.497	0.561	0.944	1	1.5	0.561	0.629
	April	0.560	0.595	0.898	1	1.5	0.595	0.598
	May	0.516	0.586	0.962	1	1.5	0.586	0.641
	June	0.715	0.638	0.836	1	1.5	0.638	0.558
	July	0.534	0.590	0.920	1	1.5	0.590	0.613
	August	0.527	0.588	0.932	1	1.5	0.588	0.621
	September	0.486	0.569	0.943	1	1.5	0.569	0.629
	October	0.491	0.576	0.938	1	1.5	0.576	0.625
	November	0.491	0.579	0.939	1	1.5	0.579	0.626
	December	0.492	0.582	0.940	1	1.5	0.582	0.627
Closure (2043-2060)	January	0.374	0.374	0.374	1	1.5	0.374	0.249
	February	0.374	0.374	0.374	1	1.5	0.374	0.249
	March	0.374	0.374	0.374	1	1.5	0.374	0.249
	April	0.374	0.374	0.374	1	1.5	0.374	0.249
	May	0.374	0.374	0.374	1	1.5	0.374	0.249
	June	0.374	0.374	0.374	1	1.5	0.374	0.249
	July	0.374	0.374	0.374	1	1.5	0.374	0.249
	August	0.374	0.374	0.374	1	1.5	0.374	0.249
	September	0.374	0.374	0.374	1	1.5	0.374	0.249
	October	0.374	0.374	0.374	1	1.5	0.374	0.249
	November	0.374	0.374	0.374	1	1.5	0.374	0.249
	December	0.374	0.374	0.374	1	1.5	0.374	0.249

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4
M20 Creek

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G4a. M20 Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality						Aquatic Life Guidelines for Dissolved Aluminum ¹	
		Dissolved Aluminum Concentration			Total Aluminum Concentration			BC MOE 30-Day Mean	BC MOE Maximum
		Median	Mean	Maximum	Median	Mean	Maximum		
Construction (2015-2017)	January	0.0248	0.0248	0.0248	0.790	0.790	0.790	0.05	0.10
	February	0.0136	0.0136	0.0136	0.611	0.611	0.611	0.05	0.10
	March	0.0215	0.0215	0.0215	0.721	0.721	0.721	0.05	0.10
	April	0.0688	0.0688	0.0688	2.32	2.32	2.32	0.05	0.10
	May	0.127	0.127	0.127	8.17	8.17	8.17	0.05	0.10
	June	0.0758	0.0758	0.0758	3.56	3.56	3.56	0.05	0.10
	July	0.0297	0.0297	0.0297	1.69	1.69	1.69	0.05	0.10
	August	0.0112	0.0112	0.0112	0.948	0.948	0.948	0.05	0.10
	September	0.0127	0.0127	0.0127	0.772	0.772	0.772	0.05	0.10
	October	0.0123	0.0123	0.0123	0.933	0.933	0.933	0.05	0.10
	November	0.0232	0.0232	0.0232	0.930	0.930	0.930	0.05	0.10
	December	0.0274	0.0274	0.0274	0.807	0.807	0.807	0.05	0.10
Operations (2018-2042)	January	0.0252	0.0255	0.0322	0.790	0.790	0.790	0.05	0.10
	February	0.0140	0.0140	0.0140	0.611	0.611	0.611	0.05	0.10
	March	0.0218	0.0218	0.0219	0.721	0.721	0.721	0.05	0.10
	April	0.0693	0.0693	0.0693	2.32	2.32	2.32	0.05	0.10
	May	0.127	0.127	0.127	8.18	8.18	8.18	0.05	0.10
	June	0.0761	0.0761	0.0761	3.56	3.56	3.56	0.05	0.10
	July	0.0296	0.0297	0.0297	1.68	1.68	1.69	0.05	0.10
	August	0.0114	0.0114	0.0114	0.948	0.948	0.948	0.05	0.10
	September	0.0132	0.0131	0.0132	0.772	0.772	0.772	0.05	0.10
	October	0.0129	0.0128	0.0129	0.933	0.933	0.933	0.05	0.10
	November	0.0237	0.0237	0.0238	0.930	0.930	0.930	0.05	0.10
	December	0.0278	0.0278	0.0278	0.807	0.807	0.807	0.05	0.10
Closure (2043-2060)	January	0.0256	0.0256	0.0256	0.791	0.791	0.791	0.05	0.10
	February	0.0143	0.0143	0.0143	0.612	0.612	0.612	0.05	0.10
	March	0.0221	0.0221	0.0221	0.722	0.722	0.722	0.05	0.10
	April	0.0699	0.0699	0.0699	2.32	2.32	2.32	0.05	0.10
	May	0.127	0.127	0.127	8.18	8.18	8.18	0.05	0.10
	June	0.0765	0.0765	0.0765	3.56	3.56	3.56	0.05	0.10
	July	0.0301	0.0301	0.0301	1.68	1.68	1.68	0.05	0.10
	August	0.0116	0.0116	0.0116	0.949	0.949	0.949	0.05	0.10
	September	0.0136	0.0136	0.0136	0.773	0.773	0.773	0.05	0.10
	October	0.0134	0.0134	0.0134	0.934	0.934	0.934	0.05	0.10
	November	0.0242	0.0242	0.0242	0.931	0.931	0.931	0.05	0.10
	December	0.0281	0.0281	0.0281	0.808	0.808	0.808	0.05	0.10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH dependent

Appendix 8-G4a. M20 Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	BC MOE Working Water Quality Guidelines for Wildlife Water Supply for Total Aluminum BC MOE 30-Day Mean	Hazard Quotient relative to Aquatic Life Guideline for Dissolved Aluminum		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply for Total Aluminum
			Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	5	0.496	0.248	0.158
	February	5	0.272	0.136	0.122
	March	5	0.430	0.215	0.144
	April	5	1.38	0.688	0.464
	May	5	2.54	1.27	1.63
	June	5	1.52	0.758	0.711
	July	5	0.593	0.297	0.337
	August	5	0.224	0.112	0.190
	September	5	0.254	0.127	0.154
	October	5	0.246	0.123	0.187
	November	5	0.464	0.232	0.186
	December	5	0.548	0.274	0.161
Operations (2018-2042)	January	5	0.510	0.322	0.158
	February	5	0.279	0.140	0.122
	March	5	0.437	0.219	0.144
	April	5	1.39	0.693	0.463
	May	5	2.54	1.27	1.64
	June	5	1.52	0.761	0.712
	July	5	0.593	0.297	0.336
	August	5	0.228	0.114	0.190
	September	5	0.263	0.132	0.154
	October	5	0.257	0.129	0.187
	November	5	0.474	0.238	0.186
	December	5	0.555	0.278	0.161
Closure (2043-2060)	January	5	0.512	0.256	0.158
	February	5	0.286	0.143	0.122
	March	5	0.443	0.221	0.144
	April	5	1.40	0.699	0.464
	May	5	2.55	1.27	1.64
	June	5	1.53	0.765	0.712
	July	5	0.602	0.301	0.336
	August	5	0.232	0.116	0.190
	September	5	0.271	0.136	0.155
	October	5	0.268	0.134	0.187
	November	5	0.484	0.242	0.186
	December	5	0.562	0.281	0.162

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH dependent

Appendix 8-G4b. M20 Creek Hazard Quotients for Total Antimony, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Antimony Concentration			BC MOE Working Guideline	BC Working DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC Working DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000115	0.000115	0.000115	0.020	0.014	0.00575	0.00821
	February	0.000100	0.000100	0.000100	0.020	0.014	0.00500	0.00714
	March	0.000110	0.000110	0.000110	0.020	0.014	0.00550	0.00786
	April	0.000170	0.000170	0.000170	0.020	0.014	0.00850	0.0121
	May	0.000360	0.000360	0.000360	0.020	0.014	0.0180	0.0257
	June	0.000200	0.000200	0.000200	0.020	0.014	0.0100	0.0143
	July	0.000168	0.000168	0.000168	0.020	0.014	0.00842	0.0120
	August	0.000165	0.000165	0.000165	0.020	0.014	0.00825	0.0118
	September	0.000125	0.000125	0.000125	0.020	0.014	0.00625	0.00893
	October	0.000110	0.000110	0.000110	0.020	0.014	0.00550	0.00786
	November	0.000120	0.000120	0.000120	0.020	0.014	0.00600	0.00857
	December	0.000100	0.000100	0.000100	0.020	0.014	0.00500	0.00714
Operations (2018-2042)	January	0.000116	0.000116	0.000116	0.020	0.014	0.00581	0.00831
	February	0.000101	0.000101	0.000101	0.020	0.014	0.00505	0.00723
	March	0.000111	0.000111	0.000111	0.020	0.014	0.00555	0.00794
	April	0.000172	0.000172	0.000175	0.020	0.014	0.00858	0.0125
	May	0.000361	0.000361	0.000361	0.020	0.014	0.0180	0.0258
	June	0.000201	0.000201	0.000201	0.020	0.014	0.0101	0.0144
	July	0.000169	0.000169	0.000169	0.020	0.014	0.00844	0.0121
	August	0.000166	0.000166	0.000166	0.020	0.014	0.00828	0.0118
	September	0.000126	0.000126	0.000126	0.020	0.014	0.00632	0.00903
	October	0.000112	0.000112	0.000112	0.020	0.014	0.00558	0.00798
	November	0.000122	0.000122	0.000122	0.020	0.014	0.00608	0.00869
	December	0.000101	0.000101	0.000101	0.020	0.014	0.00505	0.00723
Closure (2043-2060)	January	0.000115	0.000115	0.000115	0.020	0.014	0.00575	0.00822
	February	0.000100	0.000100	0.000100	0.020	0.014	0.00500	0.00715
	March	0.000110	0.000110	0.000110	0.020	0.014	0.00550	0.00786
	April	0.000170	0.000170	0.000170	0.020	0.014	0.00849	0.0121
	May	0.000360	0.000360	0.000360	0.020	0.014	0.0180	0.0257
	June	0.000200	0.000200	0.000200	0.020	0.014	0.0100	0.0143
	July	0.000167	0.000167	0.000167	0.020	0.014	0.00837	0.0120
	August	0.000165	0.000165	0.000165	0.020	0.014	0.00825	0.0118
	September	0.000125	0.000125	0.000125	0.020	0.014	0.00625	0.00893
	October	0.000110	0.000110	0.000110	0.020	0.014	0.00550	0.00786
	November	0.000120	0.000120	0.000120	0.020	0.014	0.00600	0.00857
	December	0.000100	0.000100	0.000100	0.020	0.014	0.00500	0.00714

Notes:

All concentrations in mg/L.

DWQG = Drinking water quality guideline

Grey shading indicates a hazard quotient > 1.0

Appendix 8-G4c. M20 Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Arsenic Concentration			BC MOE Maximum	BC DWQG	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000470	0.000470	0.000470	0.005	0.025	0.025	0.094
	February	0.000280	0.000280	0.000280	0.005	0.025	0.025	0.0560
	March	0.000320	0.000320	0.000320	0.005	0.025	0.025	0.0640
	April	0.000770	0.000770	0.000770	0.005	0.025	0.025	0.154
	May	0.00405	0.00405	0.00405	0.005	0.025	0.025	0.810
	June	0.00142	0.00142	0.00142	0.005	0.025	0.025	0.285
	July	0.000669	0.000669	0.000669	0.005	0.025	0.025	0.134
	August	0.000425	0.000425	0.000425	0.005	0.025	0.025	0.0850
	September	0.000400	0.000400	0.000400	0.005	0.025	0.025	0.0800
	October	0.000410	0.000410	0.000410	0.005	0.025	0.025	0.0820
	November	0.000460	0.000460	0.000460	0.005	0.025	0.025	0.0920
	December	0.000400	0.000400	0.000400	0.005	0.025	0.025	0.0800
Operations (2018-2042)	January	0.000471	0.000471	0.000471	0.005	0.025	0.025	0.094
	February	0.000281	0.000281	0.000281	0.005	0.025	0.025	0.0563
	March	0.000321	0.000321	0.000321	0.005	0.025	0.025	0.0642
	April	0.000771	0.000771	0.000786	0.005	0.025	0.025	0.157
	May	0.00406	0.00406	0.00406	0.005	0.025	0.025	0.812
	June	0.00143	0.00143	0.00143	0.005	0.025	0.025	0.285
	July	0.000666	0.000666	0.000669	0.005	0.025	0.025	0.134
	August	0.000426	0.000426	0.000426	0.005	0.025	0.025	0.0851
	September	0.000401	0.000401	0.000402	0.005	0.025	0.025	0.0803
	October	0.000412	0.000412	0.000412	0.005	0.025	0.025	0.0824
	November	0.000462	0.000462	0.000462	0.005	0.025	0.025	0.0924
	December	0.000401	0.000401	0.000401	0.005	0.025	0.025	0.0802
Closure (2043-2060)	January	0.000470	0.000470	0.000470	0.005	0.025	0.025	0.094
	February	0.000280	0.000280	0.000280	0.005	0.025	0.025	0.0560
	March	0.000320	0.000320	0.000320	0.005	0.025	0.025	0.0640
	April	0.000769	0.000769	0.000769	0.005	0.025	0.025	0.154
	May	0.00406	0.00406	0.00406	0.005	0.025	0.025	0.811
	June	0.00142	0.00142	0.00142	0.005	0.025	0.025	0.285
	July	0.000665	0.000665	0.000665	0.005	0.025	0.025	0.133
	August	0.000425	0.000425	0.000425	0.005	0.025	0.025	0.0850
	September	0.000400	0.000400	0.000400	0.005	0.025	0.025	0.0800
	October	0.000410	0.000410	0.000410	0.005	0.025	0.025	0.0820
	November	0.000460	0.000460	0.000460	0.005	0.025	0.025	0.0920
	December	0.000400	0.000400	0.000400	0.005	0.025	0.025	0.0800

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4c. M20 Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0188	0.0188
	February	0.0112	0.0112
	March	0.0128	0.0128
	April	0.0308	0.0308
	May	0.162	0.162
	June	0.0570	0.0570
	July	0.0268	0.0268
	August	0.0170	0.0170
	September	0.0160	0.0160
	October	0.0164	0.0164
	November	0.0184	0.0184
	December	0.0160	0.0160
Operations (2018-2042)	January	0.0189	0.0189
	February	0.0113	0.0113
	March	0.0128	0.0128
	April	0.0314	0.0314
	May	0.162	0.162
	June	0.0570	0.0570
	July	0.0268	0.0268
	August	0.0170	0.0170
	September	0.0161	0.0161
	October	0.0165	0.0165
	November	0.0185	0.0185
	December	0.0160	0.0160
Closure (2043-2060)	January	0.0188	0.0188
	February	0.0112	0.0112
	March	0.0128	0.0128
	April	0.0308	0.0308
	May	0.162	0.162
	June	0.0570	0.0570
	July	0.0266	0.0266
	August	0.0170	0.0170
	September	0.0160	0.0160
	October	0.0164	0.0164
	November	0.0184	0.0184
	December	0.0160	0.0160

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4d. M20 Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Barium Concentration			BC MOE 30-Day Mean Working Guideline	BC MOE Maximum Working Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.169	0.169	0.169	1	5	1
	February	0.157	0.157	0.157	1	5	1
	March	0.167	0.167	0.167	1	5	1
	April	0.185	0.185	0.185	1	5	1
	May	0.340	0.340	0.340	1	5	1
	June	0.181	0.181	0.181	1	5	1
	July	0.174	0.174	0.174	1	5	1
	August	0.181	0.181	0.181	1	5	1
	September	0.182	0.182	0.182	1	5	1
	October	0.187	0.187	0.187	1	5	1
	November	0.172	0.172	0.172	1	5	1
	December	0.176	0.176	0.176	1	5	1
Operations (2018-2042)	January	0.169	0.169	0.169	1	5	1
	February	0.157	0.157	0.157	1	5	1
	March	0.167	0.167	0.167	1	5	1
	April	0.185	0.185	0.185	1	5	1
	May	0.341	0.341	0.341	1	5	1
	June	0.181	0.181	0.181	1	5	1
	July	0.174	0.174	0.174	1	5	1
	August	0.181	0.181	0.181	1	5	1
	September	0.182	0.182	0.182	1	5	1
	October	0.187	0.187	0.187	1	5	1
	November	0.172	0.172	0.172	1	5	1
	December	0.176	0.176	0.176	1	5	1
Closure (2043-2060)	January	0.169	0.169	0.169	1	5	1
	February	0.157	0.157	0.157	1	5	1
	March	0.167	0.167	0.167	1	5	1
	April	0.185	0.185	0.185	1	5	1
	May	0.341	0.341	0.341	1	5	1
	June	0.181	0.181	0.181	1	5	1
	July	0.174	0.174	0.174	1	5	1
	August	0.181	0.181	0.181	1	5	1
	September	0.182	0.182	0.182	1	5	1
	October	0.187	0.187	0.187	1	5	1
	November	0.172	0.172	0.172	1	5	1
	December	0.176	0.176	0.176	1	5	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4d. M20 Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Working Guideline	Maximum Predicted vs. BC MOE Maximum Working Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.169	0.0338	0.169
	February	0.157	0.0314	0.157
	March	0.167	0.0334	0.167
	April	0.185	0.0370	0.185
	May	0.340	0.0681	0.340
	June	0.181	0.0363	0.181
	July	0.174	0.0348	0.174
	August	0.181	0.0362	0.181
	September	0.182	0.0364	0.182
	October	0.187	0.0374	0.187
	November	0.172	0.0344	0.172
	December	0.176	0.0352	0.176
Operations (2018-2042)	January	0.169	0.0338	0.169
	February	0.157	0.0314	0.157
	March	0.167	0.0334	0.167
	April	0.185	0.0370	0.185
	May	0.341	0.0682	0.341
	June	0.181	0.0363	0.181
	July	0.174	0.0349	0.174
	August	0.181	0.0362	0.181
	September	0.182	0.0364	0.182
	October	0.187	0.0374	0.187
	November	0.172	0.0344	0.172
	December	0.176	0.0352	0.176
Closure (2043-2060)	January	0.169	0.0338	0.169
	February	0.157	0.0314	0.157
	March	0.167	0.0334	0.167
	April	0.185	0.0370	0.185
	May	0.341	0.0682	0.341
	June	0.181	0.0363	0.181
	July	0.174	0.0349	0.174
	August	0.181	0.0362	0.181
	September	0.182	0.0364	0.182
	October	0.187	0.0374	0.187
	November	0.172	0.0344	0.172
	December	0.176	0.0352	0.176

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4e. M20 Creek Hazard Quotients for Total Beryllium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Beryllium Concentration			BC MOE Working Guideline	BC DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	February	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	March	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	April	0.000110	0.000110	0.000110	0.0053	0.004	0.0208	0.0275
	May	0.000270	0.000270	0.000270	0.0053	0.004	0.0509	0.0674
	June	0.000230	0.000230	0.000230	0.0053	0.004	0.0433	0.0574
	July	0.000187	0.000187	0.000187	0.0053	0.004	0.0353	0.0468
	August	0.0000800	0.0000800	0.0000800	0.0053	0.004	0.0151	0.0200
	September	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	October	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	November	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	December	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
Operations (2018-2042)	January	0.0000502	0.0000502	0.0000502	0.0053	0.004	0.0095	0.0126
	February	0.0000502	0.0000502	0.0000502	0.0053	0.004	0.00947	0.0125
	March	0.0000502	0.0000501	0.0000502	0.0053	0.004	0.00947	0.0125
	April	0.000110	0.000110	0.000110	0.0053	0.004	0.0208	0.0276
	May	0.000270	0.000270	0.000270	0.0053	0.004	0.0509	0.0675
	June	0.000230	0.000230	0.000230	0.0053	0.004	0.0434	0.0575
	July	0.000188	0.000188	0.000188	0.0053	0.004	0.0354	0.0469
	August	0.0000801	0.0000801	0.0000801	0.0053	0.004	0.0151	0.0200
	September	0.0000502	0.0000502	0.0000502	0.0053	0.004	0.00947	0.0126
	October	0.0000503	0.0000502	0.0000503	0.0053	0.004	0.00948	0.0126
	November	0.0000502	0.0000502	0.0000503	0.0053	0.004	0.00948	0.0126
	December	0.0000502	0.0000502	0.0000502	0.0053	0.004	0.00947	0.0125
Closure (2043-2060)	January	0.000050	0.000050	0.000050	0.0053	0.004	0.00950	0.0126
	February	0.000050	0.000050	0.000050	0.0053	0.004	0.00949	0.0126
	March	0.000050	0.000050	0.000050	0.0053	0.004	0.00949	0.0126
	April	0.000110	0.000110	0.000110	0.0053	0.004	0.0208	0.0276
	May	0.000270	0.000270	0.000270	0.0053	0.004	0.0510	0.0675
	June	0.000230	0.000230	0.000230	0.0053	0.004	0.0434	0.0576
	July	0.000188	0.000188	0.000188	0.0053	0.004	0.0354	0.0470
	August	0.0000802	0.0000802	0.0000802	0.0053	0.004	0.0151	0.0200
	September	0.0000504	0.0000504	0.0000504	0.0053	0.004	0.00951	0.0126
	October	0.0000505	0.0000505	0.0000505	0.0053	0.004	0.00953	0.0126
	November	0.0000505	0.0000505	0.0000505	0.0053	0.004	0.00952	0.0126
	December	0.0000503	0.0000503	0.0000503	0.0053	0.004	0.00949	0.0126

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4f. M20 Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Boron Concentration			BC MOE Maximum	BC DWQG	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0125	0.0125	0.0125	1.2	5	5	0.0104
	February	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	March	0.0125	0.0125	0.0125	1.2	5	5	0.0104
	April	0.0160	0.0160	0.0160	1.2	5	5	0.0133
	May	0.0190	0.0190	0.0190	1.2	5	5	0.0158
	June	0.0150	0.0150	0.0150	1.2	5	5	0.0125
	July	0.0170	0.0170	0.0170	1.2	5	5	0.0142
	August	0.0180	0.0180	0.0180	1.2	5	5	0.0150
	September	0.0150	0.0150	0.0150	1.2	5	5	0.0125
	October	0.0130	0.0130	0.0130	1.2	5	5	0.0108
	November	0.0130	0.0130	0.0130	1.2	5	5	0.0108
	December	0.0150	0.0150	0.0150	1.2	5	5	0.0125
Operations (2018-2042)	January	0.01255	0.01255	0.0126	1.2	5	5	0.0105
	February	0.0140	0.0140	0.0141	1.2	5	5	0.0117
	March	0.0125	0.0125	0.0125	1.2	5	5	0.0105
	April	0.0161	0.0161	0.0161	1.2	5	5	0.0134
	May	0.0190	0.0190	0.0190	1.2	5	5	0.0159
	June	0.0150	0.0150	0.0150	1.2	5	5	0.0125
	July	0.0171	0.0171	0.0171	1.2	5	5	0.0142
	August	0.0180	0.0180	0.0180	1.2	5	5	0.0150
	September	0.0151	0.0151	0.0151	1.2	5	5	0.0126
	October	0.0131	0.0131	0.0131	1.2	5	5	0.0109
	November	0.0131	0.0131	0.0131	1.2	5	5	0.0109
	December	0.0150	0.0150	0.0150	1.2	5	5	0.0125
Closure (2043-2060)	January	0.0125	0.0125	0.0125	1.2	5	5	0.0105
	February	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	March	0.0125	0.0125	0.0125	1.2	5	5	0.0104
	April	0.0160	0.0160	0.0160	1.2	5	5	0.0134
	May	0.0190	0.0190	0.0190	1.2	5	5	0.0159
	June	0.0150	0.0150	0.0150	1.2	5	5	0.0125
	July	0.0170	0.0170	0.0170	1.2	5	5	0.0142
	August	0.0180	0.0180	0.0180	1.2	5	5	0.0150
	September	0.0150	0.0150	0.0150	1.2	5	5	0.0125
	October	0.0131	0.0131	0.0131	1.2	5	5	0.0109
	November	0.0131	0.0131	0.0131	1.2	5	5	0.0109
	December	0.0150	0.0150	0.0150	1.2	5	5	0.0125

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4f. M20 Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.00250	0.00250
	February	0.00280	0.00280
	March	0.00250	0.00250
	April	0.00320	0.00320
	May	0.00380	0.00380
	June	0.00300	0.00300
	July	0.00340	0.00340
	August	0.00360	0.00360
	September	0.00300	0.00300
	October	0.00260	0.00260
	November	0.00260	0.00260
	December	0.00300	0.00300
Operations (2018-2042)	January	0.00251	0.00251
	February	0.00281	0.00281
	March	0.00251	0.00251
	April	0.00321	0.00321
	May	0.00380	0.00380
	June	0.00301	0.00301
	July	0.00341	0.00341
	August	0.00360	0.00360
	September	0.00301	0.00301
	October	0.00261	0.00261
	November	0.00261	0.00261
	December	0.00301	0.00301
Closure (2043-2060)	January	0.00251	0.00251
	February	0.00281	0.00281
	March	0.00251	0.00251
	April	0.00321	0.00321
	May	0.00380	0.00380
	June	0.00301	0.00301
	July	0.00341	0.00341
	August	0.00360	0.00360
	September	0.00301	0.00301
	October	0.00261	0.00261
	November	0.00261	0.00261
	December	0.00301	0.00301

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4g. M20 Creek Hazard Quotients for Total Cadmium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Cadmium Concentration			BC MOE Working Guideline	Canadian DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. Canadian DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000560	0.0000560	0.0000560	0.00006	0.005	0.49753	0.0058
	February	0.0000290	0.0000290	0.0000290	0.00006	0.005	0.69328	0.00810
	March	0.0000405	0.0000405	0.0000405	0.00006	0.005	2.21655	0.02480
	April	0.000124	0.000124	0.000124	0.00006	0.005	14.23236	0.0868
	May	0.000434	0.000434	0.000434	0.00003	0.005	5.9780	0.0394
	June	0.000197	0.000197	0.000197	0.00003	0.005	1.6528	0.0163
	July	0.0000815	0.0000815	0.0000815	0.00005	0.005	0.71838	0.0080
	August	0.0000400	0.0000400	0.0000400	0.00006	0.005	0.69882	0.00840
	September	0.0000420	0.0000420	0.0000420	0.00006	0.005	0.74235	0.00900
	October	0.0000450	0.0000450	0.0000450	0.00006	0.005	0.78250	0.0090
	November	0.0000450	0.0000450	0.0000450	0.00006	0.005	0.71392	0.00860
	December	0.0000430	0.0000430	0.0000430	0.00006	0.005	0.93214	0.01125
Operations (2018-2042)	January	0.0000562	0.0000562	0.0000563	0.00006	0.005	0.50154	0.0058
	February	0.0000292	0.0000292	0.0000292	0.00006	0.005	0.69698	0.00814
	March	0.0000407	0.0000407	0.0000407	0.00006	0.005	2.23719	0.02503
	April	0.000124	0.000124	0.000125	0.00006	0.005	14.25573	0.0870
	May	0.000435	0.000435	0.000435	0.00003	0.005	5.9845	0.0394
	June	0.000197	0.000197	0.000197	0.00003	0.005	1.6530	0.0163
	July	0.0000812	0.0000812	0.0000816	0.00005	0.005	0.72025	0.0080
	August	0.0000401	0.0000401	0.0000401	0.00006	0.005	0.70345	0.00846
	September	0.0000423	0.0000423	0.0000423	0.00006	0.005	0.74793	0.00907
	October	0.0000453	0.0000453	0.0000453	0.00006	0.005	0.78821	0.0091
	November	0.0000453	0.0000453	0.0000453	0.00006	0.005	0.71770	0.00865
	December	0.0000432	0.0000432	0.0000432	0.00006	0.005	0.93494	0.01129
Closure (2043-2060)	January	0.0000564	0.0000564	0.0000564	0.00006	0.005	0.50407	0.0059
	February	0.0000294	0.0000294	0.0000294	0.00006	0.005	0.69937	0.00817
	March	0.0000409	0.0000409	0.0000409	0.00006	0.005	2.22524	0.02490
	April	0.000124	0.000124	0.000124	0.00006	0.005	14.26072	0.0870
	May	0.000435	0.000435	0.000435	0.00003	0.005	5.9914	0.0395
	June	0.000197	0.000197	0.000197	0.00003	0.005	1.6514	0.0163
	July	0.0000815	0.0000815	0.0000815	0.00005	0.005	0.72204	0.0080
	August	0.0000402	0.0000402	0.0000402	0.00006	0.005	0.70684	0.00850
	September	0.0000425	0.0000425	0.0000425	0.00006	0.005	0.75243	0.00912
	October	0.0000456	0.0000456	0.0000456	0.00006	0.005	0.79223	0.0091
	November	0.0000456	0.0000456	0.0000456	0.00006	0.005	0.72018	0.00868
	December	0.0000434	0.0000434	0.0000434	0.00006	0.005	0.00344	0.00928

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G4h. M20 Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Chromium Concentration			CCME Cr VI Guideline	CCME CR III Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.00114	0.00114	0.00114	0.001	0.0089	0.05
	February	0.000980	0.000980	0.000980	0.001	0.0089	0.05
	March	0.00108	0.00108	0.00108	0.001	0.0089	0.05
	April	0.00340	0.00340	0.00340	0.001	0.0089	0.05
	May	0.0106	0.0106	0.0106	0.001	0.0089	0.05
	June	0.00560	0.00560	0.00560	0.001	0.0089	0.05
	July	0.00258	0.00258	0.00258	0.001	0.0089	0.05
	August	0.00157	0.00157	0.00157	0.001	0.0089	0.05
	September	0.00133	0.00133	0.00133	0.001	0.0089	0.05
	October	0.00139	0.00139	0.00139	0.001	0.0089	0.05
	November	0.00156	0.00156	0.00156	0.001	0.0089	0.05
	December	0.00129	0.00129	0.00129	0.001	0.0089	0.05
Operations (2018-2042)	January	0.00114	0.00114	0.00114	0.001	0.0089	0.05
	February	0.000980	0.000980	0.000980	0.001	0.0089	0.05
	March	0.00109	0.00109	0.00109	0.001	0.0089	0.05
	April	0.00340	0.00340	0.00340	0.001	0.0089	0.05
	May	0.0106	0.0106	0.0106	0.001	0.0089	0.05
	June	0.00561	0.00561	0.00561	0.001	0.0089	0.05
	July	0.00257	0.00257	0.00258	0.001	0.0089	0.05
	August	0.00157	0.00157	0.00157	0.001	0.0089	0.05
	September	0.00133	0.00133	0.00133	0.001	0.0089	0.05
	October	0.00139	0.00139	0.00139	0.001	0.0089	0.05
	November	0.00156	0.00156	0.00156	0.001	0.0089	0.05
	December	0.00129	0.00129	0.00129	0.001	0.0089	0.05
Closure (2043-2060)	January	0.00114	0.00114	0.00114	0.001	0.0089	0.05
	February	0.000980	0.000980	0.000980	0.001	0.0089	0.05
	March	0.00109	0.00109	0.00109	0.001	0.0089	0.05
	April	0.00340	0.00340	0.00340	0.001	0.0089	0.05
	May	0.0106	0.0106	0.0106	0.001	0.0089	0.05
	June	0.00561	0.00561	0.00561	0.001	0.0089	0.05
	July	0.00257	0.00257	0.00257	0.001	0.0089	0.05
	August	0.00157	0.00157	0.00157	0.001	0.0089	0.05
	September	0.00133	0.00133	0.00133	0.001	0.0089	0.05
	October	0.00139	0.00139	0.00139	0.001	0.0089	0.05
	November	0.00156	0.00156	0.00156	0.001	0.0089	0.05
	December	0.00129	0.00129	0.00129	0.001	0.0089	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

CCME = Canadian Council of Ministers of the Environment

DWQG = Drinking water quality guideline

Appendix 8-G4h. M20 Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Maximum Predicted vs. CCME Cr VI Guideline	Maximum Predicted vs. CCME Cr III Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	1.14	0.128	0.0227
	February	0.980	0.110	0.0196
	March	1.08	0.122	0.0217
	April	3.40	0.382	0.0680
	May	10.6	1.188	0.212
	June	5.60	0.630	0.112
	July	2.58	0.290	0.0516
	August	1.57	0.176	0.0314
	September	1.33	0.149	0.0266
	October	1.39	0.156	0.0278
	November	1.56	0.175	0.0312
	December	1.29	0.145	0.0258
Operations (2018-2042)	January	1.14	0.128	0.0227
	February	0.980	0.110	0.0196
	March	1.09	0.122	0.0217
	April	3.40	0.382	0.0680
	May	10.6	1.190	0.212
	June	5.61	0.630	0.112
	July	2.58	0.290	0.0516
	August	1.57	0.176	0.0314
	September	1.33	0.149	0.0266
	October	1.39	0.156	0.0278
	November	1.56	0.175	0.0312
	December	1.29	0.145	0.0258
Closure (2043-2060)	January	1.14	0.128	0.0227
	February	0.980	0.110	0.0196
	March	1.09	0.122	0.0217
	April	3.40	0.382	0.0679
	May	10.6	1.190	0.212
	June	5.61	0.630	0.112
	July	2.57	0.289	0.0515
	August	1.57	0.176	0.0314
	September	1.33	0.149	0.0266
	October	1.39	0.156	0.0278
	November	1.56	0.175	0.0312
	December	1.29	0.145	0.0258

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

CCME = Canadian Council of Ministers of the Environment

DWQG = Drinking water quality guideline

Appendix 8-G4i. M20 Creek Hazard Quotients for Total Cobalt, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Cobalt Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000580	0.000580	0.000580	0.004	0.110	0.145	0.00527
	February	0.000200	0.000200	0.000200	0.004	0.110	0.0500	0.00182
	March	0.000305	0.000305	0.000305	0.004	0.110	0.0762	0.00277
	April	0.0012700	0.0012700	0.0012700	0.004	0.110	0.318	0.0115
	May	0.0046529	0.0046529	0.0046533	0.004	0.110	1.16	0.0423
	June	0.0017518	0.0017518	0.0017520	0.004	0.110	0.438	0.0159
	July	0.000702	0.000702	0.000702	0.004	0.110	0.175	0.00638
	August	0.000325	0.000325	0.000325	0.004	0.110	0.0813	0.00295
	September	0.000365	0.000365	0.000365	0.004	0.110	0.0913	0.00332
	October	0.000370	0.000370	0.000370	0.004	0.110	0.093	0.00336
	November	0.000320	0.000320	0.000320	0.004	0.110	0.0800	0.00291
	December	0.000420	0.000420	0.000420	0.004	0.110	0.1050	0.00382
Operations (2018-2042)	January	0.000588	0.000587	0.000589	0.004	0.110	0.147	0.00535
	February	0.000207	0.000207	0.000208	0.004	0.110	0.0516	0.00189
	March	0.000312	0.000311	0.000312	0.004	0.110	0.0778	0.00284
	April	0.00128	0.00128	0.00131	0.004	0.110	0.320	0.0119
	May	0.00466	0.00466	0.00466	0.004	0.110	1.17	0.0424
	June	0.00176	0.00176	0.00176	0.004	0.110	0.439	0.0160
	July	0.000698	0.000699	0.000702	0.004	0.110	0.175	0.00638
	August	0.000329	0.000328	0.000329	0.004	0.110	0.0821	0.00299
	September	0.000374	0.000373	0.000374	0.004	0.110	0.0933	0.00340
	October	0.000381	0.000380	0.000381	0.004	0.110	0.095	0.00346
	November	0.000330	0.000330	0.000331	0.004	0.110	0.0825	0.00301
	December	0.000427	0.000427	0.000427	0.004	0.110	0.107	0.00389
Closure (2043-2060)	January	0.000591	0.000591	0.000591	0.004	0.110	0.148	0.00537
	February	0.000209	0.000209	0.000209	0.004	0.110	0.0524	0.00190
	March	0.000314	0.000314	0.000314	0.004	0.110	0.0785	0.00285
	April	0.00128	0.00128	0.00128	0.004	0.110	0.321	0.0117
	May	0.00466	0.00466	0.00466	0.004	0.110	1.17	0.0424
	June	0.00176	0.00176	0.00176	0.004	0.110	0.440	0.0160
	July	0.000703	0.000703	0.000703	0.004	0.110	0.176	0.00639
	August	0.000330	0.000330	0.000330	0.004	0.110	0.0826	0.00300
	September	0.000377	0.000377	0.000377	0.004	0.110	0.0943	0.00343
	October	0.000385	0.000385	0.000385	0.004	0.110	0.096	0.00350
	November	0.000334	0.000334	0.000334	0.004	0.110	0.0835	0.00304
	December	0.000429	0.000429	0.000429	0.004	0.110	0.107	0.00390

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4j. M20 Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹		BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration			BC MOE 30-Day Mean	BC MOE Maximum	
		Median	Mean	Maximum			30-Day Mean
Construction (2015-2017)	January	0.00140	0.00140	0.00140	0.00804	0.0209	0.3
	February	0.00106	0.00106	0.00106	0.00772	0.0201	0.3
	March	0.00139	0.00139	0.00139	0.00774	0.0202	0.3
	April	0.00311	0.00311	0.00311	0.00736	0.0193	0.3
	May	0.0132	0.0132	0.0132	0.00364	0.0105	0.3
	June	0.00513	0.00513	0.00513	0.00398	0.0113	0.3
	July	0.00260	0.00260	0.00260	0.00636	0.0169	0.3
	August	0.00274	0.00274	0.00274	0.00732	0.0192	0.3
	September	0.00158	0.00158	0.00158	0.00800	0.0208	0.3
	October	0.00163	0.00163	0.00163	0.00808	0.0210	0.3
	November	0.00203	0.00203	0.00203	0.00760	0.0199	0.3
	December	0.00150	0.00150	0.00150	0.00802	0.0208	0.3
Operations (2018-2042)	January	0.00141	0.00141	0.00141	0.00804	0.0209	0.3
	February	0.00106	0.00106	0.00106	0.00772	0.0201	0.3
	March	0.00139	0.00139	0.00139	0.00774	0.0202	0.3
	April	0.00311	0.00311	0.00314	0.00736	0.0193	0.3
	May	0.0132	0.0132	0.0132	0.00364	0.0105	0.3
	June	0.00514	0.00514	0.00514	0.00398	0.0113	0.3
	July	0.00259	0.00259	0.00260	0.00636	0.0169	0.3
	August	0.00274	0.00274	0.00274	0.00732	0.0192	0.3
	September	0.00158	0.00158	0.00158	0.00800	0.0208	0.3
	October	0.00164	0.00163	0.00164	0.00808	0.0210	0.3
	November	0.00203	0.00203	0.00204	0.00760	0.0199	0.3
	December	0.00150	0.00150	0.00150	0.00802	0.0208	0.3
Closure (2043-2060)	January	0.00141	0.00141	0.00141	0.00804	0.0209	0.3
	February	0.00107	0.00107	0.00107	0.00772	0.0201	0.3
	March	0.00139	0.00139	0.00139	0.00774	0.0202	0.3
	April	0.00311	0.00311	0.00311	0.00736	0.0193	0.3
	May	0.0132	0.0132	0.0132	0.00364	0.0105	0.3
	June	0.00514	0.00514	0.00514	0.00398	0.0113	0.3
	July	0.00259	0.00259	0.00259	0.00636	0.0169	0.3
	August	0.00274	0.00274	0.00274	0.00732	0.0192	0.3
	September	0.00158	0.00158	0.00158	0.00800	0.0208	0.3
	October	0.00164	0.00164	0.00164	0.00808	0.0210	0.3
	November	0.00204	0.00204	0.00204	0.00760	0.0199	0.3
	December	0.00151	0.00151	0.00151	0.00802	0.0208	0.3

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G4j. M20 Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.175	0.067	0.00468
	February	0.137	0.053	0.00353
	March	0.180	0.069	0.00463
	April	0.423	0.161	0.0104
	May	3.62	1.25	0.0439
	June	1.29	0.453	0.0171
	July	0.408	0.153	0.00866
	August	0.374	0.143	0.00913
	September	0.197	0.076	0.00525
	October	0.202	0.078	0.00543
	November	0.267	0.102	0.00677
	December	0.187	0.072	0.00500
Operations (2018-2042)	January	0.175	0.067	0.00470
	February	0.138	0.053	0.00354
	March	0.180	0.069	0.00464
	April	0.423	0.163	0.0104
	May	3.63	1.25	0.0440
	June	1.29	0.453	0.0171
	July	0.407	0.153	0.00863
	August	0.374	0.143	0.00914
	September	0.197	0.076	0.00526
	October	0.202	0.078	0.00545
	November	0.268	0.102	0.00678
	December	0.187	0.072	0.00501
Closure (2043-2060)	January	0.175	0.068	0.00470
	February	0.138	0.053	0.00355
	March	0.180	0.069	0.00465
	April	0.423	0.161	0.0104
	May	3.63	1.25	0.0440
	June	1.29	0.453	0.0171
	July	0.407	0.153	0.00864
	August	0.375	0.143	0.00914
	September	0.198	0.076	0.00527
	October	0.203	0.078	0.00546
	November	0.268	0.103	0.00679
	December	0.188	0.072	0.00502

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G4k. M20 Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Predicted Water Quality						Aquatic Life Guideline	
		Dissolved Iron Concentration			Total Iron Concentration			BC MOE Maximum Guideline for Dissolved Iron	BC MOE Maximum Guideline for Total Iron
		Median	Mean	Maximum	Median	Mean	Maximum		
Construction (2015-2017)	January	0.0150	0.0150	0.0150	0.560	0.560	0.560	0.35	1
	February	0.0150	0.0150	0.0150	0.397	0.397	0.397	0.35	1
	March	0.0150	0.0150	0.0150	0.415	0.415	0.415	0.35	1
	April	0.0150	0.0150	0.0150	1.91	1.91	1.91	0.35	1
	May	0.128	0.128	0.128	11.5	11.5	11.5	0.35	1
	June	0.0789	0.0789	0.0789	3.85	3.85	3.85	0.35	1
	July	0.0252	0.0252	0.0252	1.50	1.50	1.50	0.35	1
	August	0.0150	0.0150	0.0150	0.669	0.669	0.669	0.35	1
	September	0.0150	0.0150	0.0150	0.619	0.619	0.619	0.35	1
	October	0.0150	0.0150	0.0150	0.800	0.800	0.800	0.35	1
	November	0.0150	0.0150	0.0150	0.739	0.739	0.739	0.35	1
	December	0.0150	0.0150	0.0150	0.654	0.654	0.654	0.35	1
Operations (2018-2042)	January	0.0151	0.0152	0.0183	0.560	0.560	0.560	0.35	1
	February	0.0151	0.0151	0.0151	0.397	0.397	0.397	0.35	1
	March	0.0151	0.0151	0.0151	0.415	0.415	0.415	0.35	1
	April	0.0151	0.0151	0.0151	1.91	1.91	1.94	0.35	1
	May	0.128	0.128	0.128	11.5	11.5	11.5	0.35	1
	June	0.0790	0.0790	0.0790	3.85	3.85	3.85	0.35	1
	July	0.0251	0.0251	0.0252	1.48	1.48	1.50	0.35	1
	August	0.0150	0.0150	0.0150	0.668	0.668	0.669	0.35	1
	September	0.0151	0.0151	0.0151	0.620	0.620	0.620	0.35	1
	October	0.0151	0.0151	0.0151	0.800	0.800	0.800	0.35	1
	November	0.0151	0.0151	0.0151	0.739	0.739	0.739	0.35	1
	December	0.0151	0.0151	0.0151	0.654	0.654	0.654	0.35	1
Closure (2043-2060)	January	0.0151	0.0151	0.0151	0.560	0.560	0.560	0.35	1
	February	0.0151	0.0151	0.0151	0.397	0.397	0.397	0.35	1
	March	0.0151	0.0151	0.0151	0.415	0.415	0.415	0.35	1
	April	0.0152	0.0152	0.0152	1.91	1.91	1.91	0.35	1
	May	0.128	0.128	0.128	11.5	11.5	11.5	0.35	1
	June	0.0791	0.0791	0.0791	3.85	3.85	3.85	0.35	1
	July	0.0251	0.0251	0.0251	1.48	1.48	1.48	0.35	1
	August	0.0151	0.0151	0.0151	0.668	0.668	0.668	0.35	1
	September	0.0151	0.0151	0.0151	0.620	0.620	0.620	0.35	1
	October	0.0152	0.0152	0.0152	0.800	0.800	0.800	0.35	1
	November	0.0152	0.0152	0.0152	0.739	0.739	0.739	0.35	1
	December	0.0151	0.0151	0.0151	0.654	0.654	0.654	0.35	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4k. M20 Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	
		Maximum Predicted vs. BC MOE Maximum Guideline for Dissolved Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Total Iron
Construction (2015-2017)	January	0.0429	0.560
	February	0.0429	0.397
	March	0.0429	0.415
	April	0.0429	1.91
	May	0.365	11.5
	June	0.226	3.85
	July	0.0719	1.50
	August	0.0429	0.669
	September	0.0429	0.619
	October	0.0429	0.800
	November	0.0429	0.739
	December	0.0429	0.654
Operations (2018-2042)	January	0.0522	0.560
	February	0.0431	0.397
	March	0.0431	0.415
	April	0.0431	1.94
	May	0.366	11.5
	June	0.226	3.85
	July	0.0719	1.50
	August	0.0429	0.669
	September	0.0431	0.620
	October	0.0432	0.800
	November	0.0432	0.739
	December	0.0431	0.654
Closure (2043-2060)	January	0.0432	0.560
	February	0.0432	0.397
	March	0.0431	0.415
	April	0.0433	1.91
	May	0.366	11.5
	June	0.226	3.85
	July	0.0718	1.48
	August	0.0430	0.668
	September	0.0432	0.620
	October	0.0433	0.800
	November	0.0433	0.739
	December	0.0432	0.654

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4I. M20 Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	BC MOE 30-Day Mean
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000272	0.000272	0.000272	0.0111	0.133	0.05	0.1
	February	0.000194	0.000194	0.000194	0.0107	0.127	0.05	0.1
	March	0.000218	0.000218	0.000218	0.0107	0.127	0.05	0.1
	April	0.000935	0.000935	0.000935	0.0102	0.119	0.05	0.1
	May	0.00620	0.00620	0.00620	0.00613	0.0485	0.05	0.1
	June	0.00228	0.00228	0.00228	0.00647	0.0544	0.05	0.1
	July	0.000766	0.000766	0.000766	0.00906	0.0989	0.05	0.1
	August	0.000644	0.000644	0.000644	0.0102	0.118	0.05	0.1
	September	0.000330	0.000330	0.000330	0.0110	0.132	0.05	0.1
	October	0.000405	0.000405	0.000405	0.0111	0.134	0.05	0.1
	November	0.000363	0.000363	0.000363	0.0105	0.124	0.05	0.1
	December	0.000304	0.000304	0.000304	0.0110	0.133	0.05	0.1
Operations (2018-2042)	January	0.000272	0.000272	0.000272	0.0111	0.133	0.05	0.1
	February	0.000194	0.000194	0.000194	0.0107	0.127	0.05	0.1
	March	0.000218	0.000218	0.000218	0.0107	0.127	0.05	0.1
	April	0.000934	0.000935	0.000958	0.0102	0.119	0.05	0.1
	May	0.00621	0.00621	0.00621	0.00613	0.0485	0.05	0.1
	June	0.00228	0.00228	0.00228	0.00647	0.0544	0.05	0.1
	July	0.000759	0.000760	0.000766	0.00906	0.0989	0.05	0.1
	August	0.000644	0.000644	0.000644	0.0102	0.118	0.05	0.1
	September	0.000330	0.000330	0.000330	0.0110	0.132	0.05	0.1
	October	0.000405	0.000405	0.000405	0.0111	0.134	0.05	0.1
	November	0.000363	0.000363	0.000363	0.0105	0.124	0.05	0.1
	December	0.000304	0.000304	0.000304	0.0110	0.133	0.05	0.1
Closure (2043-2060)	January	0.000272	0.000272	0.000272	0.0111	0.133	0.05	0.1
	February	0.000194	0.000194	0.000194	0.0107	0.127	0.05	0.1
	March	0.000218	0.000218	0.000218	0.0107	0.127	0.05	0.1
	April	0.000934	0.000934	0.000934	0.0102	0.119	0.05	0.1
	May	0.00621	0.00621	0.00621	0.00613	0.0485	0.05	0.1
	June	0.00228	0.00228	0.00228	0.00647	0.0544	0.05	0.1
	July	0.000760	0.000760	0.000760	0.00906	0.0989	0.05	0.1
	August	0.000644	0.000644	0.000644	0.0102	0.118	0.05	0.1
	September	0.000330	0.000330	0.000330	0.0110	0.132	0.05	0.1
	October	0.000405	0.000405	0.000405	0.0111	0.134	0.05	0.1
	November	0.000363	0.000363	0.000363	0.0105	0.124	0.05	0.1
	December	0.000304	0.000304	0.000304	0.0110	0.133	0.05	0.1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G4I. M20 Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.0246	0.00204	0.00544	0.00272
	February	0.0182	0.00153	0.00388	0.00194
	March	0.0204	0.00172	0.00436	0.00218
	April	0.0914	0.00785	0.0187	0.00935
	May	1.01	0.128	0.124	0.0620
	June	0.352	0.0419	0.0456	0.0228
	July	0.0846	0.00775	0.0153	0.00766
	August	0.0632	0.00544	0.0129	0.00644
	September	0.0300	0.00249	0.00660	0.00330
	October	0.0365	0.00302	0.00810	0.00405
	November	0.0345	0.00293	0.00726	0.00363
	December	0.0276	0.00229	0.00608	0.00304
Operations (2018-2042)	January	0.0246	0.00204	0.00545	0.00272
	February	0.0182	0.00153	0.00388	0.00194
	March	0.0204	0.00172	0.00436	0.00218
	April	0.0914	0.00804	0.0192	0.00935
	May	1.01	0.128	0.124	0.0621
	June	0.352	0.0419	0.0456	0.0228
	July	0.0839	0.00775	0.0153	0.00760
	August	0.0632	0.00544	0.0129	0.00644
	September	0.0300	0.00249	0.00661	0.00330
	October	0.0365	0.00302	0.00811	0.00405
	November	0.0345	0.00293	0.00727	0.00363
	December	0.0276	0.00229	0.00608	0.00304
Closure (2043-2060)	January	0.0246	0.00204	0.00545	0.00272
	February	0.0182	0.00154	0.00389	0.00194
	March	0.0204	0.00172	0.00437	0.00218
	April	0.0913	0.00784	0.0187	0.00934
	May	1.01	0.128	0.124	0.0621
	June	0.352	0.0419	0.0456	0.0228
	July	0.0839	0.00768	0.0152	0.00760
	August	0.0632	0.00544	0.0129	0.00644
	September	0.0300	0.00249	0.00661	0.00330
	October	0.0365	0.00302	0.00811	0.00405
	November	0.0345	0.00293	0.00727	0.00363
	December	0.0276	0.00229	0.00609	0.00304

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G4m. M20 Creek Hazard Quotients for Total Lithium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Lithium Concentration			BC MOE Working Final Chronic Value Guideline	BC MOE Working Maximum Guideline	Maximum Predicted vs. BC MOE Working Final Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0123	0.0123	0.0123	0.096	0.87	0.128	0.0141
	February	0.0109	0.0109	0.0109	0.096	0.87	0.114	0.0125
	March	0.0126	0.0126	0.0126	0.096	0.87	0.131	0.0144
	April	0.0144	0.0144	0.0144	0.096	0.87	0.150	0.0166
	May	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	June	0.00756	0.00756	0.00756	0.096	0.87	0.0787	0.00869
	July	0.00904	0.00904	0.00904	0.096	0.87	0.0941	0.0104
	August	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	September	0.00939	0.00939	0.00939	0.096	0.87	0.0978	0.0108
	October	0.00954	0.00954	0.00954	0.096	0.87	0.0994	0.0110
	November	0.00856	0.00856	0.00856	0.096	0.87	0.0892	0.00984
	December	0.0102	0.0102	0.0102	0.096	0.87	0.106	0.0117
Operations (2018-2042)	January	0.0123	0.0123	0.0123	0.096	0.87	0.128	0.0142
	February	0.0109	0.0109	0.0109	0.096	0.87	0.114	0.0126
	March	0.0126	0.0126	0.0126	0.096	0.87	0.131	0.0145
	April	0.0144	0.0144	0.0144	0.096	0.87	0.150	0.0166
	May	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0119
	June	0.00759	0.00758	0.00759	0.096	0.87	0.0790	0.00872
	July	0.00907	0.00907	0.00907	0.096	0.87	0.0945	0.0104
	August	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	September	0.00943	0.00942	0.00943	0.096	0.87	0.0982	0.0108
	October	0.00958	0.00958	0.00958	0.096	0.87	0.0998	0.0110
	November	0.00860	0.00860	0.00860	0.096	0.87	0.0896	0.00989
	December	0.0102	0.0102	0.0102	0.096	0.87	0.107	0.0118
Closure (2043-2060)	January	0.0123	0.0123	0.0123	0.096	0.87	0.128	0.0142
	February	0.0109	0.0109	0.0109	0.096	0.87	0.114	0.0125
	March	0.0126	0.0126	0.0126	0.096	0.87	0.131	0.0144
	April	0.0144	0.0144	0.0144	0.096	0.87	0.150	0.0166
	May	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	June	0.00757	0.00757	0.00757	0.096	0.87	0.0788	0.00870
	July	0.00905	0.00905	0.00905	0.096	0.87	0.0943	0.0104
	August	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	September	0.00940	0.00940	0.00940	0.096	0.87	0.0980	0.0108
	October	0.00956	0.00956	0.00956	0.096	0.87	0.0995	0.0110
	November	0.00858	0.00858	0.00858	0.096	0.87	0.0893	0.00986
	December	0.0102	0.0102	0.0102	0.096	0.87	0.106	0.0117

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4n. M20 Creek Hazard Quotients for Total Manganese, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Manganese Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0121	0.0121	0.0121	1.49	2.76	0.00812	0.00439
	February	0.00606	0.00606	0.00606	1.45	2.67	0.00417	0.00227
	March	0.00707	0.00707	0.00707	1.46	2.67	0.00485	0.00264
	April	0.0320	0.0320	0.0320	1.41	2.57	0.0226	0.0125
	May	0.168	0.168	0.168	1.00	1.54	0.167	0.109
	June	0.0700	0.0700	0.0700	1.04	1.64	0.0672	0.0428
	July	0.0249	0.0249	0.0249	1.30	2.29	0.0191	0.0109
	August	0.0108	0.0108	0.0108	1.41	2.56	0.00767	0.00423
	September	0.0106	0.0106	0.0106	1.49	2.74	0.00714	0.00386
	October	0.0117	0.0117	0.0117	1.49	2.77	0.00783	0.00423
	November	0.0107	0.0107	0.0107	1.44	2.63	0.00743	0.00406
	December	0.0110	0.0110	0.0110	1.49	2.75	0.00740	0.00400
Operations (2018-2042)	January	0.0122	0.0122	0.0122	1.49	2.76	0.00816	0.00442
	February	0.00612	0.00611	0.00612	1.45	2.67	0.00420	0.00229
	March	0.00712	0.00711	0.00712	1.46	2.67	0.00488	0.00266
	April	0.0320	0.0321	0.0327	1.41	2.57	0.0227	0.0127
	May	0.168	0.168	0.168	1.00	1.54	0.167	0.109
	June	0.0701	0.0701	0.0701	1.04	1.64	0.0672	0.0428
	July	0.0248	0.0248	0.0249	1.30	2.29	0.0190	0.0109
	August	0.0108	0.0108	0.0108	1.41	2.56	0.00769	0.00424
	September	0.0107	0.0107	0.0107	1.49	2.74	0.00718	0.00389
	October	0.0118	0.0118	0.0118	1.49	2.77	0.00789	0.00426
	November	0.0108	0.0108	0.0108	1.44	2.63	0.00748	0.00409
	December	0.0111	0.0111	0.0111	1.49	2.75	0.00743	0.00402
Closure (2043-2060)	January	0.0122	0.0122	0.0122	1.49	2.76	0.00820	0.00443
	February	0.00616	0.00616	0.00616	1.45	2.67	0.00423	0.00231
	March	0.00716	0.00716	0.00716	1.46	2.67	0.00491	0.00268
	April	0.0321	0.0321	0.0321	1.41	2.57	0.0227	0.0125
	May	0.168	0.168	0.168	1.00	1.54	0.167	0.109
	June	0.0701	0.0701	0.0701	1.04	1.64	0.0673	0.0429
	July	0.0248	0.0248	0.0248	1.30	2.29	0.0190	0.0108
	August	0.0109	0.0109	0.0109	1.41	2.56	0.00771	0.00425
	September	0.0107	0.0107	0.0107	1.49	2.74	0.00722	0.00391
	October	0.0119	0.0119	0.0119	1.49	2.77	0.00794	0.00429
	November	0.0108	0.0108	0.0108	1.44	2.63	0.00752	0.00412
	December	0.0111	0.0111	0.0111	1.49	2.75	0.00746	0.00404

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

¹ Guidelines are hardness dependent

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4o. M20 Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	BC DWQG	BC MOE 30-Day Mean if MeHg is 0.5% of THg
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	February	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	March	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	May	0.0000339	0.0000339	0.0000340	0.00002	0.001	0.00002
	June	0.0000110	0.0000110	0.0000110	0.00002	0.001	0.00002
	July	0.0000509	0.0000509	0.0000509	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	October	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	November	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	December	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
Operations (2018-2042)	January	0.0000506	0.0000506	0.0000507	0.00002	0.001	0.00002
	February	0.0000505	0.0000505	0.0000506	0.00002	0.001	0.00002
	March	0.0000505	0.0000505	0.0000505	0.00002	0.001	0.00002
	April	0.0000508	0.0000509	0.0000544	0.00002	0.001	0.00002
	May	0.0000340	0.0000340	0.0000340	0.00002	0.001	0.00002
	June	0.0000111	0.0000111	0.0000111	0.00002	0.001	0.00002
	July	0.0000507	0.0000507	0.0000509	0.00002	0.001	0.00002
	August	0.0000503	0.0000503	0.0000503	0.00002	0.001	0.00002
	September	0.0000507	0.0000506	0.0000507	0.00002	0.001	0.00002
	October	0.0000508	0.0000508	0.0000509	0.00002	0.001	0.00002
	November	0.0000508	0.0000508	0.0000508	0.00002	0.001	0.00002
	December	0.0000505	0.0000505	0.0000506	0.00002	0.001	0.00002
Closure (2043-2060)	January	0.0000508	0.0000508	0.0000508	0.00002	0.001	0.00002
	February	0.0000507	0.0000507	0.0000507	0.00002	0.001	0.00002
	March	0.0000506	0.0000506	0.0000506	0.00002	0.001	0.00002
	April	0.0000511	0.0000511	0.0000511	0.00002	0.001	0.00002
	May	0.0000340	0.0000340	0.0000340	0.00002	0.001	0.00002
	June	0.0000111	0.0000111	0.0000111	0.00002	0.001	0.00002
	July	0.0000509	0.0000509	0.0000509	0.00002	0.001	0.00002
	August	0.0000504	0.0000504	0.0000504	0.00002	0.001	0.00002
	September	0.0000508	0.0000508	0.0000508	0.00002	0.001	0.00002
	October	0.0000511	0.0000511	0.0000511	0.00002	0.001	0.00002
	November	0.0000510	0.0000510	0.0000510	0.00002	0.001	0.00002
	December	0.0000507	0.0000507	0.0000507	0.00002	0.001	0.00002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4o. M20 Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg
Construction (2015-2017)	January	0.250	0.00500	0.250
	February	0.250	0.00500	0.250
	March	0.250	0.00500	0.250
	April	0.250	0.00500	0.250
	May	1.70	0.0340	1.70
	June	0.551	0.0110	0.551
	July	0.254	0.00509	0.254
	August	0.250	0.00500	0.250
	September	0.250	0.00500	0.250
	October	0.250	0.00500	0.250
	November	0.250	0.00500	0.250
	December	0.250	0.00500	0.250
Operations (2018-2042)	January	0.253	0.00507	0.253
	February	0.253	0.00506	0.253
	March	0.252	0.00505	0.252
	April	0.255	0.00544	0.255
	May	1.70	0.0340	1.70
	June	0.553	0.0111	0.553
	July	0.253	0.00509	0.253
	August	0.251	0.00503	0.251
	September	0.253	0.00507	0.253
	October	0.254	0.00509	0.254
	November	0.254	0.00508	0.254
	December	0.253	0.00506	0.253
Closure (2043-2060)	January	0.254	0.00508	0.254
	February	0.253	0.00507	0.253
	March	0.253	0.00506	0.253
	April	0.255	0.00511	0.255
	May	1.70	0.0340	1.70
	June	0.554	0.0111	0.554
	July	0.254	0.00509	0.254
	August	0.252	0.00504	0.252
	September	0.254	0.00508	0.254
	October	0.255	0.00511	0.255
	November	0.255	0.00510	0.255
	December	0.253	0.00507	0.253

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4p. M20 Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000628	0.000628	0.000628	1	2	0.25	0.05
	February	0.000728	0.000728	0.000728	1	2	0.25	0.05
	March	0.000683	0.000683	0.000683	1	2	0.25	0.05
	April	0.000690	0.000690	0.000690	1	2	0.25	0.05
	May	0.000939	0.000939	0.000939	1	2	0.25	0.05
	June	0.000655	0.000655	0.000655	1	2	0.25	0.05
	July	0.000717	0.000717	0.000717	1	2	0.25	0.05
	August	0.000759	0.000759	0.000759	1	2	0.25	0.05
	September	0.000698	0.000698	0.000698	1	2	0.25	0.05
	October	0.000680	0.000680	0.000680	1	2	0.25	0.05
	November	0.000578	0.000578	0.000578	1	2	0.25	0.05
	December	0.000621	0.000621	0.000621	1	2	0.25	0.05
Operations (2018-2042)	January	0.000636	0.000635	0.000637	1	2	0.25	0.05
	February	0.000735	0.000735	0.000736	1	2	0.25	0.05
	March	0.000690	0.000690	0.000691	1	2	0.25	0.05
	April	0.000701	0.000702	0.000723	1	2	0.25	0.05
	May	0.000942	0.000942	0.000942	1	2	0.25	0.05
	June	0.000661	0.000661	0.000661	1	2	0.25	0.05
	July	0.000721	0.000720	0.000721	1	2	0.25	0.05
	August	0.000762	0.000762	0.000762	1	2	0.25	0.05
	September	0.000707	0.000706	0.000707	1	2	0.25	0.05
	October	0.000691	0.000691	0.000692	1	2	0.25	0.05
	November	0.000589	0.000588	0.000589	1	2	0.25	0.05
	December	0.000628	0.000628	0.000629	1	2	0.25	0.05
Closure (2043-2060)	January	0.000628	0.000628	0.000628	1	2	0.25	0.05
	February	0.000729	0.000729	0.000729	1	2	0.25	0.05
	March	0.000684	0.000684	0.000684	1	2	0.25	0.05
	April	0.000690	0.000690	0.000690	1	2	0.25	0.05
	May	0.000937	0.000937	0.000937	1	2	0.25	0.05
	June	0.000653	0.000653	0.000653	1	2	0.25	0.05
	July	0.000712	0.000712	0.000712	1	2	0.25	0.05
	August	0.000759	0.000759	0.000759	1	2	0.25	0.05
	September	0.000698	0.000698	0.000698	1	2	0.25	0.05
	October	0.000681	0.000681	0.000681	1	2	0.25	0.05
	November	0.000579	0.000579	0.000579	1	2	0.25	0.05
	December	0.000622	0.000622	0.000622	1	2	0.25	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4p. M20 Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline	
		Construction (2015-2017)		January	0.000628	0.000314
		February	0.000728	0.000364	0.00291	0.0146
		March	0.000683	0.000342	0.00273	0.0137
		April	0.000690	0.000345	0.00276	0.0138
		May	0.000939	0.000470	0.00376	0.0188
		June	0.000655	0.000328	0.00262	0.0131
		July	0.000717	0.000359	0.00287	0.0143
		August	0.000759	0.000379	0.00303	0.0152
		September	0.000698	0.000349	0.00279	0.0140
		October	0.000680	0.000340	0.00272	0.0136
		November	0.000578	0.000289	0.00231	0.0116
		December	0.000621	0.000311	0.00248	0.0124
Operations (2018-2042)		January	0.000635	0.000318	0.00255	0.0127
		February	0.000735	0.000368	0.00294	0.0147
		March	0.000690	0.000345	0.00276	0.0138
		April	0.000702	0.000362	0.00289	0.0145
		May	0.000942	0.000471	0.00377	0.0188
		June	0.000661	0.000331	0.00265	0.0132
		July	0.000720	0.000360	0.00288	0.0144
		August	0.000762	0.000381	0.00305	0.0152
		September	0.000706	0.000354	0.00283	0.0141
		October	0.000691	0.000346	0.00277	0.0138
		November	0.000588	0.000295	0.00236	0.0118
		December	0.000628	0.000314	0.00252	0.0126
Closure (2043-2060)		January	0.000628	0.000314	0.00251	0.0126
		February	0.000729	0.000364	0.00291	0.0146
		March	0.000684	0.000342	0.00274	0.0137
		April	0.000690	0.000345	0.00276	0.0138
		May	0.000937	0.000468	0.00375	0.0187
		June	0.000653	0.000327	0.00261	0.0131
		July	0.000712	0.000356	0.00285	0.0142
		August	0.000759	0.000379	0.00303	0.0152
		September	0.000698	0.000349	0.00279	0.0140
		October	0.000681	0.000340	0.00272	0.0136
		November	0.000579	0.000289	0.00232	0.0116
		December	0.000622	0.000311	0.00249	0.0124

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4q. M20 Creek Hazard Quotients for Total Nickel, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Hazard Quotient relative to Aquatic Life Guideline
		Total Nickel Concentration			BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00353	0.00353	0.00353	0.15	0.0235
	February	0.00174	0.00174	0.00174	0.15	0.0116
	March	0.00244	0.00244	0.00244	0.15	0.0163
	April	0.00655	0.00655	0.00655	0.15	0.0437
	May	0.0174	0.0174	0.0174	0.065	0.267
	June	0.00727	0.00727	0.00727	0.065	0.112
	July	0.00347	0.00347	0.00347	0.11	0.0316
	August	0.00228	0.00228	0.00228	0.15	0.0152
	September	0.00233	0.00233	0.00233	0.15	0.0155
	October	0.00231	0.00231	0.00231	0.15	0.0154
	November	0.00202	0.00202	0.00202	0.15	0.0135
	December	0.00271	0.00271	0.00271	0.15	0.0181
Operations (2018-2042)	January	0.00356	0.00355	0.00356	0.15	0.0237
	February	0.00176	0.00176	0.00176	0.15	0.0118
	March	0.00246	0.00246	0.00246	0.15	0.0164
	April	0.00658	0.00658	0.00663	0.15	0.0442
	May	0.0174	0.0174	0.0174	0.065	0.268
	June	0.00729	0.00729	0.00729	0.065	0.112
	July	0.00346	0.00346	0.00347	0.11	0.0316
	August	0.00229	0.00229	0.00229	0.15	0.0153
	September	0.00236	0.00236	0.00236	0.15	0.0157
	October	0.00234	0.00234	0.00234	0.15	0.0156
	November	0.00205	0.00205	0.00205	0.15	0.0137
	December	0.00273	0.00273	0.00273	0.15	0.0182
Closure (2043-2060)	January	0.00356	0.00356	0.00356	0.15	0.0238
	February	0.00177	0.00177	0.00177	0.15	0.0118
	March	0.00247	0.00247	0.00247	0.15	0.0165
	April	0.00659	0.00659	0.00659	0.15	0.0440
	May	0.0174	0.0174	0.0174	0.065	0.268
	June	0.00730	0.00730	0.00730	0.065	0.112
	July	0.00348	0.00348	0.00348	0.11	0.0316
	August	0.00230	0.00230	0.00230	0.15	0.0153
	September	0.00237	0.00237	0.00237	0.15	0.0158
	October	0.00236	0.00236	0.00236	0.15	0.0157
	November	0.00207	0.00207	0.00207	0.15	0.0138
	December	0.00274	0.00274	0.00274	0.15	0.0183

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guideline is hardness dependent

Appendix 8-G4r. M20 Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Selenium Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00101	0.00101	0.00101	0.002	0.01	0.002	0.507
	February	0.00110	0.00110	0.00110	0.002	0.01	0.002	0.550
	March	0.000980	0.000980	0.000980	0.002	0.01	0.002	0.490
	April	0.000930	0.000930	0.000930	0.002	0.01	0.002	0.465
	May	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.560
	June	0.00137	0.00137	0.00137	0.002	0.01	0.002	0.685
	July	0.00145	0.00145	0.00145	0.002	0.01	0.002	0.724
	August	0.00119	0.00119	0.00119	0.002	0.01	0.002	0.595
	September	0.00101	0.00101	0.00101	0.002	0.01	0.002	0.507
	October	0.00114	0.00114	0.00114	0.002	0.01	0.002	0.570
	November	0.00113	0.00113	0.00113	0.002	0.01	0.002	0.565
	December	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.560
Operations (2018-2042)	January	0.00102	0.00102	0.00102	0.002	0.01	0.002	0.509
	February	0.00110	0.00110	0.00110	0.002	0.01	0.002	0.551
	March	0.000983	0.000983	0.000983	0.002	0.01	0.002	0.491
	April	0.000934	0.000934	0.000935	0.002	0.01	0.002	0.467
	May	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.561
	June	0.00137	0.00137	0.00137	0.002	0.01	0.002	0.686
	July	0.00145	0.00145	0.00145	0.002	0.01	0.002	0.727
	August	0.00119	0.00119	0.00119	0.002	0.01	0.002	0.596
	September	0.00102	0.00102	0.00102	0.002	0.01	0.002	0.509
	October	0.00114	0.00114	0.00114	0.002	0.01	0.002	0.572
	November	0.00113	0.00113	0.00113	0.002	0.01	0.002	0.567
	December	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.561
Closure (2043-2060)	January	0.00102	0.00102	0.00102	0.002	0.01	0.002	0.508
	February	0.00110	0.00110	0.00110	0.002	0.01	0.002	0.551
	March	0.000981	0.000981	0.000981	0.002	0.01	0.002	0.491
	April	0.000931	0.000931	0.000931	0.002	0.01	0.002	0.465
	May	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.560
	June	0.00137	0.00137	0.00137	0.002	0.01	0.002	0.685
	July	0.00145	0.00145	0.00145	0.002	0.01	0.002	0.725
	August	0.00119	0.00119	0.00119	0.002	0.01	0.002	0.595
	September	0.00102	0.00102	0.00102	0.002	0.01	0.002	0.508
	October	0.00114	0.00114	0.00114	0.002	0.01	0.002	0.571
	November	0.00113	0.00113	0.00113	0.002	0.01	0.002	0.566
	December	0.00112	0.00112	0.00112	0.002	0.01	0.002	0.561

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4r. M20 Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.101	0.507
	February	0.110	0.550
	March	0.0980	0.490
	April	0.0930	0.465
	May	0.112	0.560
	June	0.137	0.685
	July	0.145	0.724
	August	0.119	0.595
	September	0.101	0.507
	October	0.114	0.570
	November	0.113	0.565
	December	0.112	0.560
Operations (2018-2042)	January	0.102	0.509
	February	0.110	0.552
	March	0.0983	0.492
	April	0.0935	0.468
	May	0.112	0.561
	June	0.137	0.686
	July	0.145	0.727
	August	0.119	0.596
	September	0.102	0.510
	October	0.114	0.572
	November	0.113	0.567
	December	0.112	0.562
Closure (2043-2060)	January	0.102	0.508
	February	0.110	0.551
	March	0.0981	0.491
	April	0.0931	0.465
	May	0.112	0.560
	June	0.137	0.685
	July	0.145	0.725
	August	0.119	0.595
	September	0.102	0.508
	October	0.114	0.571
	November	0.113	0.566
	December	0.112	0.561

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4s. M20 Creek Hazard Quotients for Total Silver, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Silver Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000090	0.0000090	0.0000090	0.0015	0.003	0.00600	0.00300
	February	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00333	0.00167
	March	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00333	0.00167
	April	0.0000240	0.0000240	0.0000240	0.0015	0.003	0.0160	0.00800
	May	0.000156	0.000156	0.000156	0.00005	0.0001	3.11	1.56
	June	0.0000555	0.0000555	0.0000555	0.00005	0.0001	1.11	0.555
	July	0.0000207	0.0000207	0.0000207	0.0015	0.003	0.0138	0.00689
	August	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00333	0.00167
	September	0.00000900	0.00000900	0.00000900	0.0015	0.003	0.00600	0.00300
	October	0.0000100	0.0000100	0.0000100	0.0015	0.003	0.00667	0.00333
	November	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00333	0.00167
	December	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00333	0.00167
Operations (2018-2042)	January	0.0000090	0.0000090	0.0000090	0.0015	0.003	0.00601	0.00300
	February	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	March	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	April	0.0000240	0.0000240	0.0000246	0.0015	0.003	0.0160	0.00819
	May	0.000156	0.000156	0.000156	0.00005	0.0001	3.12	1.56
	June	0.0000555	0.0000555	0.0000555	0.00005	0.0001	1.11	0.555
	July	0.0000205	0.0000205	0.0000207	0.0015	0.003	0.0137	0.00689
	August	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00334	0.00167
	September	0.00000901	0.00000901	0.00000901	0.0015	0.003	0.00601	0.00300
	October	0.0000100	0.0000100	0.0000100	0.0015	0.003	0.00667	0.00334
	November	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	December	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
Closure (2043-2060)	January	0.0000090	0.0000090	0.0000090	0.0015	0.003	0.00601	0.00300
	February	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	March	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	April	0.0000240	0.0000240	0.0000240	0.0015	0.003	0.0160	0.00799
	May	0.000156	0.000156	0.000156	0.00005	0.0001	3.12	1.56
	June	0.0000555	0.0000555	0.0000555	0.00005	0.0001	1.11	0.555
	July	0.0000205	0.0000205	0.0000205	0.0015	0.003	0.0137	0.00683
	August	0.00000500	0.00000500	0.00000500	0.0015	0.003	0.00334	0.00167
	September	0.00000901	0.00000901	0.00000901	0.0015	0.003	0.00601	0.00300
	October	0.0000100	0.0000100	0.0000100	0.0015	0.003	0.00667	0.00334
	November	0.00000501	0.00000501	0.00000501	0.0015	0.003	0.00334	0.00167
	December	0.0000050	0.0000050	0.0000050	0.0015	0.003	0.00334	0.00167

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G4t. M20 Creek Hazard Quotients for Total Thallium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Thallium Concentration			BC MOE Working Guideline	BC DWQG	Mean Predicted vs. BC MOE Working 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000185	0.0000185	0.0000185	0.0003	0.002	0.0617	0.0092
	February	0.0000100	0.0000100	0.0000100	0.0003	0.002	0.0333	0.00500
	March	0.0000155	0.0000155	0.0000155	0.0003	0.002	0.0517	0.00775
	April	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.167	0.0250
	May	0.000194	0.000194	0.000194	0.0003	0.002	0.645	0.0968
	June	0.0000874	0.0000874	0.0000874	0.0003	0.002	0.291	0.0437
	July	0.0000501	0.0000501	0.0000501	0.0003	0.002	0.167	0.0250
	August	0.0000390	0.0000390	0.0000390	0.0003	0.002	0.130	0.0195
	September	0.0000220	0.0000220	0.0000220	0.0003	0.002	0.0733	0.0110
	October	0.0000230	0.0000230	0.0000230	0.0003	0.002	0.0767	0.01150
	November	0.0000300	0.0000300	0.0000300	0.0003	0.002	0.100	0.0150
	December	0.0000170	0.0000170	0.0000170	0.0003	0.002	0.0567	0.0085
Operations (2018-2042)	January	0.0000185	0.0000185	0.0000185	0.0003	0.002	0.0618	0.0093
	February	0.0000100	0.0000100	0.0000100	0.0003	0.002	0.0334	0.00501
	March	0.0000155	0.0000155	0.0000155	0.0003	0.002	0.0517	0.00776
	April	0.0000500	0.0000500	0.0000503	0.0003	0.002	0.167	0.0251
	May	0.000194	0.000194	0.000194	0.0003	0.002	0.646	0.0969
	June	0.0000875	0.0000875	0.0000875	0.0003	0.002	0.292	0.0437
	July	0.0000500	0.0000500	0.0000501	0.0003	0.002	0.167	0.0250
	August	0.0000390	0.0000390	0.0000390	0.0003	0.002	0.130	0.0195
	September	0.0000220	0.0000220	0.0000220	0.0003	0.002	0.0734	0.0110
	October	0.0000230	0.0000230	0.0000230	0.0003	0.002	0.0768	0.01152
	November	0.0000300	0.0000300	0.0000300	0.0003	0.002	0.100	0.0150
	December	0.0000170	0.0000170	0.0000170	0.0003	0.002	0.0567	0.0085
Closure (2043-2060)	January	0.0000185	0.0000185	0.0000185	0.0003	0.002	0.0618	0.0093
	February	0.0000100	0.0000100	0.0000100	0.0003	0.002	0.0335	0.00502
	March	0.0000155	0.0000155	0.0000155	0.0003	0.002	0.0518	0.00777
	April	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.167	0.0250
	May	0.000194	0.000194	0.000194	0.0003	0.002	0.646	0.0969
	June	0.0000875	0.0000875	0.0000875	0.0003	0.002	0.292	0.0438
	July	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.167	0.0250
	August	0.0000390	0.0000390	0.0000390	0.0003	0.002	0.130	0.0195
	September	0.0000220	0.0000220	0.0000220	0.0003	0.002	0.0735	0.0110
	October	0.0000231	0.0000231	0.0000231	0.0003	0.002	0.0769	0.01153
	November	0.0000301	0.0000301	0.0000301	0.0003	0.002	0.100	0.0150
	December	0.0000170	0.0000170	0.0000170	0.0003	0.002	0.0568	0.0085

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4u. M20 Creek Hazard Quotients for Total Uranium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Uranium Concentration			BC MOE Working Guideline	Canadian DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. Canadian DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000620	0.000620	0.000620	0.3	0.02	0.00207	0.0310
	February	0.000651	0.000651	0.000651	0.3	0.02	0.00217	0.0326
	March	0.000625	0.000625	0.000625	0.3	0.02	0.00208	0.0312
	April	0.000654	0.000654	0.000654	0.3	0.02	0.00218	0.0327
	May	0.000679	0.000679	0.000679	0.3	0.02	0.00226	0.0339
	June	0.000505	0.000505	0.000505	0.3	0.02	0.00168	0.0252
	July	0.000507	0.000507	0.000507	0.3	0.02	0.00169	0.0253
	August	0.000586	0.000586	0.000586	0.3	0.02	0.00195	0.0293
	September	0.000567	0.000567	0.000567	0.3	0.02	0.00189	0.0283
	October	0.000583	0.000583	0.000583	0.3	0.02	0.00194	0.0291
	November	0.000541	0.000541	0.000541	0.3	0.02	0.00180	0.0271
	December	0.000609	0.000609	0.000609	0.3	0.02	0.00203	0.0304
Operations (2018-2042)	January	0.000620	0.000620	0.000620	0.3	0.02	0.00207	0.0310
	February	0.000651	0.000651	0.000651	0.3	0.02	0.00217	0.0326
	March	0.000625	0.000625	0.000625	0.3	0.02	0.00208	0.0313
	April	0.000654	0.000653	0.000654	0.3	0.02	0.00218	0.0327
	May	0.000680	0.000680	0.000680	0.3	0.02	0.00227	0.0340
	June	0.000505	0.000505	0.000505	0.3	0.02	0.00168	0.0253
	July	0.000508	0.000508	0.000508	0.3	0.02	0.00169	0.0254
	August	0.000587	0.000587	0.000587	0.3	0.02	0.00196	0.0293
	September	0.000567	0.000567	0.000567	0.3	0.02	0.00189	0.0284
	October	0.000583	0.000583	0.000583	0.3	0.02	0.00194	0.0292
	November	0.000541	0.000541	0.000541	0.3	0.02	0.00180	0.0271
	December	0.000609	0.000609	0.000609	0.3	0.02	0.00203	0.0305
Closure (2043-2060)	January	0.000620	0.000620	0.000620	0.3	0.02	0.00207	0.0310
	February	0.000651	0.000651	0.000651	0.3	0.02	0.00217	0.0326
	March	0.000625	0.000625	0.000625	0.3	0.02	0.00208	0.0313
	April	0.000653	0.000653	0.000653	0.3	0.02	0.00218	0.0327
	May	0.000680	0.000680	0.000680	0.3	0.02	0.00227	0.0340
	June	0.000505	0.000505	0.000505	0.3	0.02	0.00168	0.0252
	July	0.000508	0.000508	0.000508	0.3	0.02	0.00169	0.0254
	August	0.000586	0.000586	0.000586	0.3	0.02	0.00195	0.0293
	September	0.000567	0.000567	0.000567	0.3	0.02	0.00189	0.0284
	October	0.000583	0.000583	0.000583	0.3	0.02	0.00194	0.0292
	November	0.000541	0.000541	0.000541	0.3	0.02	0.00180	0.0271
	December	0.000609	0.000609	0.000609	0.3	0.02	0.00203	0.0305

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4v. M20 Creek Hazard Quotients for Total Vanadium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Vanadium Concentration			BC MOE Working Guideline	BC MOE Working Secondary Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Secondary Chronic Value Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00260	0.00260	0.00260	0.006	0.02	0.433	0.130
	February	0.00210	0.00210	0.00210	0.006	0.02	0.350	0.105
	March	0.00250	0.00250	0.00250	0.006	0.02	0.417	0.125
	April	0.00810	0.00810	0.00810	0.006	0.02	1.35	0.405
	May	0.0230	0.0230	0.0231	0.006	0.02	3.84	1.15
	June	0.0131	0.0131	0.0131	0.006	0.02	2.18	0.654
	July	0.00601	0.00601	0.00601	0.006	0.02	1.00	0.300
	August	0.00360	0.00360	0.00360	0.006	0.02	0.600	0.180
	September	0.00295	0.00295	0.00295	0.006	0.02	0.492	0.147
	October	0.00320	0.00320	0.00320	0.006	0.02	0.533	0.160
	November	0.00330	0.00330	0.00330	0.006	0.02	0.550	0.165
	December	0.00300	0.00300	0.00300	0.006	0.02	0.500	0.150
Operations (2018-2042)	January	0.00260	0.00260	0.00260	0.006	0.02	0.434	0.130
	February	0.00210	0.00210	0.00210	0.006	0.02	0.350	0.105
	March	0.00250	0.00250	0.00250	0.006	0.02	0.417	0.125
	April	0.00809	0.00809	0.00810	0.006	0.02	1.35	0.405
	May	0.0231	0.0231	0.0231	0.006	0.02	3.85	1.15
	June	0.0131	0.0131	0.0131	0.006	0.02	2.18	0.655
	July	0.00600	0.00600	0.00601	0.006	0.02	1.00	0.300
	August	0.00360	0.00360	0.00360	0.006	0.02	0.600	0.180
	September	0.00295	0.00295	0.00295	0.006	0.02	0.492	0.148
	October	0.00320	0.00320	0.00320	0.006	0.02	0.534	0.160
	November	0.00330	0.00330	0.00330	0.006	0.02	0.550	0.165
	December	0.00300	0.00300	0.00300	0.006	0.02	0.500	0.150
Closure (2043-2060)	January	0.00260	0.00260	0.00260	0.006	0.02	0.433	0.130
	February	0.00210	0.00210	0.00210	0.006	0.02	0.350	0.105
	March	0.00250	0.00250	0.00250	0.006	0.02	0.417	0.125
	April	0.00809	0.00809	0.00809	0.006	0.02	1.35	0.404
	May	0.0231	0.0231	0.0231	0.006	0.02	3.85	1.15
	June	0.0131	0.0131	0.0131	0.006	0.02	2.18	0.655
	July	0.00600	0.00600	0.00600	0.006	0.02	1.000	0.300
	August	0.00360	0.00360	0.00360	0.006	0.02	0.600	0.180
	September	0.00295	0.00295	0.00295	0.006	0.02	0.492	0.147
	October	0.00320	0.00320	0.00320	0.006	0.02	0.533	0.160
	November	0.00330	0.00330	0.00330	0.006	0.02	0.550	0.165
	December	0.00300	0.00300	0.00300	0.006	0.02	0.500	0.150

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4w. M20 Creek Hazard Quotients for Total Zinc, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Zinc Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00925	0.00925	0.00925	0.0908	0.116	0.102	0.0796
	February	0.00430	0.00430	0.00430	0.0848	0.110	0.0507	0.0390
	March	0.00815	0.00815	0.00815	0.0851	0.111	0.0957	0.0737
	April	0.0189	0.0189	0.0189	0.0780	0.104	0.242	0.183
	May	0.0564	0.0564	0.0564	0.00818	0.0337	6.90	1.68
	June	0.0207	0.0207	0.0207	0.0146	0.0401	1.42	0.517
	July	0.00942	0.00942	0.00942	0.0593	0.0848	0.159	0.111
	August	0.00480	0.00480	0.00480	0.0773	0.103	0.0621	0.0467
	September	0.00570	0.00570	0.00570	0.0900	0.116	0.0633	0.0494
	October	0.00600	0.00600	0.00600	0.0915	0.117	0.0656	0.0513
	November	0.00500	0.00500	0.00500	0.0825	0.108	0.0606	0.0463
	December	0.00740	0.00740	0.00740	0.0904	0.116	0.0819	0.0639
Operations (2018-2042)	January	0.00933	0.00933	0.00934	0.0908	0.116	0.103	0.0803
	February	0.00437	0.00437	0.00438	0.0848	0.110	0.0515	0.0397
	March	0.00822	0.00821	0.00822	0.0851	0.111	0.0965	0.0743
	April	0.0190	0.0190	0.0192	0.0780	0.104	0.244	0.186
	May	0.0565	0.0565	0.0565	0.00818	0.0337	6.91	1.68
	June	0.0208	0.0208	0.0208	0.0146	0.0401	1.43	0.519
	July	0.00939	0.00939	0.00943	0.0593	0.0848	0.158	0.111
	August	0.00484	0.00483	0.00484	0.0773	0.103	0.0626	0.0471
	September	0.00579	0.00578	0.00579	0.0900	0.116	0.0643	0.0501
	October	0.00611	0.00610	0.00611	0.0915	0.117	0.0667	0.0522
	November	0.00510	0.00510	0.00511	0.0825	0.108	0.0618	0.0473
	December	0.00747	0.00747	0.00747	0.0904	0.116	0.0826	0.0645
Closure (2043-2060)	January	0.00937	0.00937	0.00937	0.0908	0.116	0.103	0.0806
	February	0.00440	0.00440	0.00440	0.0848	0.110	0.0520	0.0399
	March	0.00825	0.00825	0.00825	0.0851	0.111	0.0969	0.0745
	April	0.0191	0.0191	0.0191	0.0780	0.104	0.244	0.184
	May	0.0565	0.0565	0.0565	0.00818	0.0337	6.92	1.68
	June	0.0208	0.0208	0.0208	0.0146	0.0401	1.43	0.520
	July	0.00944	0.00944	0.00944	0.0593	0.0848	0.159	0.111
	August	0.00486	0.00486	0.00486	0.0773	0.103	0.0629	0.0473
	September	0.00583	0.00583	0.00583	0.0900	0.116	0.0648	0.0505
	October	0.00617	0.00617	0.00617	0.0915	0.117	0.0674	0.0527
	November	0.00515	0.00515	0.00515	0.0825	0.108	0.0625	0.0477
	December	0.00750	0.00750	0.00750	0.0904	0.116	0.0830	0.0647

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G4x. M20 Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Chloride Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Maximum
		Median	Mean	Maximum			
Construction (2015-2017)	January	1.25	1.25	1.25	150	600	600
	February	1.60	1.60	1.60	150	600	600
	March	1.29	1.29	1.29	150	600	600
	April	1.74	1.74	1.74	150	600	600
	May	0.561	0.561	0.561	150	600	600
	June	0.251	0.252	0.252	150	600	600
	July	0.254	0.254	0.254	150	600	600
	August	0.705	0.705	0.705	150	600	600
	September	0.890	0.890	0.890	150	600	600
	October	1.14	1.14	1.14	150	600	600
	November	0.900	0.900	0.900	150	600	600
	December	1.45	1.45	1.45	150	600	600
Operations (2018-2042)	January	1.25	1.25	1.25	150	600	600
	February	1.60	1.60	1.60	150	600	600
	March	1.29	1.29	1.29	150	600	600
	April	1.74	1.74	1.74	150	600	600
	May	0.563	0.563	0.563	150	600	600
	June	0.255	0.254	0.255	150	600	600
	July	0.255	0.255	0.255	150	600	600
	August	0.707	0.707	0.707	150	600	600
	September	0.895	0.895	0.895	150	600	600
	October	1.15	1.15	1.15	150	600	600
	November	0.906	0.905	0.906	150	600	600
	December	1.45	1.45	1.45	150	600	600
Closure (2043-2060)	January	1.25	1.25	1.25	150	600	600
	February	1.60	1.60	1.60	150	600	600
	March	1.29	1.29	1.29	150	600	600
	April	1.74	1.74	1.74	150	600	600
	May	0.561	0.561	0.561	150	600	600
	June	0.251	0.251	0.251	150	600	600
	July	0.252	0.252	0.252	150	600	600
	August	0.706	0.706	0.706	150	600	600
	September	0.892	0.892	0.892	150	600	600
	October	1.14	1.14	1.14	150	600	600
	November	0.902	0.902	0.902	150	600	600
	December	1.45	1.45	1.45	150	600	600

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4x. M20 Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0083	0.00208	0.00208
	February	0.0107	0.00267	0.00267
	March	0.00860	0.00215	0.00215
	April	0.0116	0.00290	0.00290
	May	0.00374	0.000935	0.000935
	June	0.00168	0.000420	0.000420
	July	0.00169	0.000424	0.000424
	August	0.00470	0.00118	0.00118
	September	0.00593	0.00148	0.00148
	October	0.00760	0.00190	0.00190
	November	0.00600	0.00150	0.00150
	December	0.0097	0.00242	0.00242
Operations (2018-2042)	January	0.00836	0.00209	0.00209
	February	0.0107	0.00267	0.00267
	March	0.00862	0.00216	0.00216
	April	0.0116	0.00291	0.00291
	May	0.00375	0.000938	0.000938
	June	0.00170	0.000424	0.000424
	July	0.00170	0.000425	0.000425
	August	0.00471	0.00118	0.00118
	September	0.00596	0.00149	0.00149
	October	0.00764	0.00191	0.00191
	November	0.00604	0.00151	0.00151
	December	0.0097	0.00242	0.00242
Closure (2043-2060)	January	0.00834	0.00209	0.00209
	February	0.0107	0.00267	0.00267
	March	0.00861	0.00215	0.00215
	April	0.0116	0.00290	0.00290
	May	0.00374	0.000934	0.000934
	June	0.00168	0.000419	0.000419
	July	0.00168	0.000419	0.000419
	August	0.00470	0.00118	0.00118
	September	0.00594	0.00149	0.00149
	October	0.00761	0.00190	0.00190
	November	0.00601	0.00150	0.00150
	December	0.0097	0.00242	0.00242

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G4y. M20 Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Fluoride Concentration			BC MOE Maximum Guideline	BC Maximum DWQG	BC 30-Day Mean DWQG	30-Day Mean	Maximum
		Median	Mean	Maximum					
Construction (2015-2017)	January	0.131	0.131	0.131	1.61	1.5	1	1	1.5
	February	0.110	0.110	0.110	1.60	1.5	1	1	1.5
	March	0.139	0.139	0.139	1.60	1.5	1	1	1.5
	April	0.151	0.151	0.151	1.58	1.5	1	1	1.5
	May	0.0730	0.0730	0.0730	1.30	1.5	1	1	1.5
	June	0.0730	0.0730	0.0730	1.33	1.5	1	1	1.5
	July	0.102	0.102	0.102	1.52	1.5	1	1	1.5
	August	0.119	0.119	0.119	1.58	1.5	1	1	1.5
	September	0.119	0.119	0.119	1.61	1.5	1	1	1.5
	October	0.123	0.123	0.123	1.62	1.5	1	1	1.5
	November	0.111	0.111	0.111	1.59	1.5	1	1	1.5
	December	0.116	0.116	0.116	1.61	1.5	1	1	1.5
Operations (2018-2042)	January	0.131	0.131	0.131	1.61	1.5	1	1	1.5
	February	0.110	0.110	0.110	1.60	1.5	1	1	1.5
	March	0.139	0.139	0.139	1.60	1.5	1	1	1.5
	April	0.151	0.151	0.151	1.58	1.5	1	1	1.5
	May	0.0731	0.0731	0.0731	1.30	1.5	1	1	1.5
	June	0.0732	0.0732	0.0732	1.33	1.5	1	1	1.5
	July	0.102	0.102	0.102	1.52	1.5	1	1	1.5
	August	0.119	0.119	0.119	1.58	1.5	1	1	1.5
	September	0.119	0.119	0.119	1.61	1.5	1	1	1.5
	October	0.123	0.123	0.123	1.62	1.5	1	1	1.5
	November	0.111	0.111	0.111	1.59	1.5	1	1	1.5
	December	0.116	0.116	0.116	1.61	1.5	1	1	1.5
Closure (2043-2060)	January	0.131	0.131	0.131	1.61	1.5	1	1	1.5
	February	0.110	0.110	0.110	1.60	1.5	1	1	1.5
	March	0.139	0.139	0.139	1.60	1.5	1	1	1.5
	April	0.1511	0.1511	0.1511	1.58	1.5	1	1	1.5
	May	0.0731	0.0731	0.0731	1.30	1.5	1	1	1.5
	June	0.0732	0.0732	0.0732	1.33	1.5	1	1	1.5
	July	0.102	0.102	0.102	1.52	1.5	1	1	1.5
	August	0.119	0.119	0.119	1.58	1.5	1	1	1.5
	September	0.119	0.119	0.119	1.61	1.5	1	1	1.5
	October	0.123	0.123	0.123	1.62	1.5	1	1	1.5
	November	0.111	0.111	0.111	1.59	1.5	1	1	1.5
	December	0.116	0.116	0.116	1.61	1.5	1	1	1.5

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G4y. M20 Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC Maximum DWQG	Maximum Predicted vs. BC 30-Day Mean DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0808	0.0870	0.131	0.131	0.0870
	February	0.0688	0.0733	0.131	0.110	0.0733
	March	0.0866	0.0923	0.110	0.139	0.0923
	April	0.0956	0.101	0.139	0.151	0.101
	May	0.0563	0.0487	0.151	0.0730	0.0487
	June	0.0548	0.0487	0.0730	0.0730	0.0487
	July	0.0669	0.0678	0.0730	0.102	0.0678
	August	0.0751	0.0790	0.102	0.119	0.0790
	September	0.0738	0.0793	0.119	0.119	0.0793
	October	0.0761	0.0820	0.119	0.123	0.0820
	November	0.0697	0.0740	0.123	0.111	0.0740
	December	0.0719	0.0773	0.116	0.116	0.0773
Operations (2018-2042)	January	0.0809	0.0871	0.131	0.131	0.0871
	February	0.0689	0.0735	0.131	0.110	0.0735
	March	0.0867	0.0924	0.110	0.139	0.0924
	April	0.0957	0.101	0.139	0.151	0.101
	May	0.0564	0.0487	0.151	0.0731	0.0487
	June	0.0549	0.0488	0.0731	0.0732	0.0488
	July	0.0672	0.0681	0.0732	0.102	0.0681
	August	0.0752	0.0790	0.102	0.119	0.0790
	September	0.0739	0.0795	0.119	0.119	0.0795
	October	0.0762	0.0822	0.119	0.123	0.0822
	November	0.0699	0.0742	0.123	0.111	0.0742
	December	0.0720	0.0775	0.116	0.116	0.0775
Closure (2043-2060)	January	0.0809	0.0871	0.131	0.131	0.0871
	February	0.0689	0.0734	0.131	0.110	0.0734
	March	0.0867	0.0924	0.110	0.139	0.0924
	April	0.0956	0.101	0.139	0.151	0.101
	May	0.0564	0.0487	0.151	0.0731	0.0487
	June	0.0549	0.0488	0.0731	0.0732	0.0488
	July	0.0672	0.0681	0.0732	0.102	0.0681
	August	0.0752	0.0790	0.102	0.119	0.0790
	September	0.0739	0.0795	0.119	0.119	0.0795
	October	0.0762	0.0821	0.119	0.123	0.0821
	November	0.0698	0.0741	0.123	0.111	0.0741
	December	0.0720	0.0774	0.116	0.116	0.0774

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ *Guideline is hardness dependent*

Appendix 8-G4z. M20 Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Nitrate Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.123	0.123	0.123	3	32.8	10
	February	0.115	0.115	0.115	3	32.8	10
	March	0.118	0.118	0.118	3	32.8	10
	April	0.0884	0.0884	0.0884	3	32.8	10
	May	0.0585	0.0585	0.0585	3	32.8	10
	June	0.0497	0.0497	0.0497	3	32.8	10
	July	0.0203	0.0203	0.0203	3	32.8	10
	August	0.00250	0.00250	0.00250	3	32.8	10
	September	0.00250	0.00250	0.00250	3	32.8	10
	October	0.00820	0.00820	0.00820	3	32.8	10
	November	0.0739	0.0739	0.0739	3	32.8	10
	December	0.1140	0.1140	0.1140	3	32.8	10
Operations (2018-2042)	January	0.123	0.123	0.123	3	32.8	10
	February	0.115	0.115	0.115	3	32.8	10
	March	0.118	0.118	0.118	3	32.8	10
	April	0.0883	0.0882	0.0884	3	32.8	10
	May	0.0586	0.0586	0.0586	3	32.8	10
	June	0.0497	0.0497	0.0497	3	32.8	10
	July	0.0202	0.0202	0.0203	3	32.8	10
	August	0.00250	0.00250	0.00250	3	32.8	10
	September	0.00250	0.00250	0.00250	3	32.8	10
	October	0.00820	0.00820	0.00820	3	32.8	10
	November	0.0739	0.0739	0.0739	3	32.8	10
	December	0.1140	0.1140	0.1140	3	32.8	10
Closure (2043-2060)	January	0.123	0.123	0.123	3	32.8	10
	February	0.115	0.115	0.115	3	32.8	10
	March	0.118	0.118	0.118	3	32.8	10
	April	0.0883	0.0883	0.0883	3	32.8	10
	May	0.0586	0.0586	0.0586	3	32.8	10
	June	0.0497	0.0497	0.0497	3	32.8	10
	July	0.0202	0.0202	0.0202	3	32.8	10
	August	0.00250	0.00250	0.00250	3	32.8	10
	September	0.00250	0.00250	0.00250	3	32.8	10
	October	0.00820	0.00820	0.00820	3	32.8	10
	November	0.0739	0.0739	0.0739	3	32.8	10
	December	0.1140	0.1140	0.1140	3	32.8	10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4z. M20 Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0412	0.00377	0.0123
	February	0.0383	0.00351	0.0115
	March	0.0393	0.00360	0.0118
	April	0.0295	0.00270	0.00884
	May	0.0195	0.00178	0.00585
	June	0.0166	0.00151	0.00497
	July	0.00676	0.000618	0.00203
	August	0.000833	0.0000762	0.000250
	September	0.000833	0.0000762	0.000250
	October	0.00273	0.000250	0.000820
	November	0.0246	0.00225	0.00739
	December	0.0380	0.00348	0.01140
Operations (2018-2042)	January	0.0412	0.00377	0.0123
	February	0.0383	0.00351	0.0115
	March	0.0393	0.00360	0.0118
	April	0.0294	0.00270	0.00884
	May	0.0195	0.00179	0.00586
	June	0.0166	0.00152	0.00497
	July	0.00675	0.000618	0.00203
	August	0.000833	0.0000762	0.000250
	September	0.000833	0.0000762	0.000250
	October	0.00273	0.000250	0.000820
	November	0.0246	0.00225	0.00739
	December	0.0380	0.00348	0.01140
Closure (2043-2060)	January	0.0412	0.00376	0.0123
	February	0.0383	0.00351	0.0115
	March	0.0393	0.00360	0.0118
	April	0.0294	0.00269	0.00883
	May	0.0195	0.00179	0.00586
	June	0.0166	0.00152	0.00497
	July	0.00675	0.000617	0.00202
	August	0.000833	0.0000762	0.000250
	September	0.000833	0.0000762	0.000250
	October	0.00273	0.000250	0.000820
	November	0.0246	0.00225	0.00739
	December	0.0380	0.00348	0.01140

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G4aa. M20 Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Drinking Water Quality Guidelines
		Nitrite Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000500	0.000500	0.000500	0.02	0.06	1
	February	0.000500	0.000500	0.000500	0.02	0.06	1
	March	0.000500	0.000500	0.000500	0.02	0.06	1
	April	0.000500	0.000500	0.000500	0.02	0.06	1
	May	0.000499	0.000499	0.000499	0.02	0.06	1
	June	0.000499	0.000499	0.000499	0.02	0.06	1
	July	0.000498	0.000498	0.000498	0.02	0.06	1
	August	0.000500	0.000500	0.000500	0.02	0.06	1
	September	0.000500	0.000500	0.000500	0.02	0.06	1
	October	0.000500	0.000500	0.000500	0.02	0.06	1
	November	0.000500	0.000500	0.000500	0.02	0.06	1
	December	0.000500	0.000500	0.000500	0.02	0.06	1
Operations (2018-2042)	January	0.000500	0.000500	0.000500	0.02	0.06	1
	February	0.000500	0.000500	0.000500	0.02	0.06	1
	March	0.000500	0.000500	0.000500	0.02	0.06	1
	April	0.000499	0.000499	0.000500	0.02	0.06	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.02	0.06	1
	July	0.000500	0.000500	0.000500	0.02	0.06	1
	August	0.000500	0.000500	0.000500	0.02	0.06	1
	September	0.000500	0.000500	0.000500	0.02	0.06	1
	October	0.000500	0.000500	0.000500	0.02	0.06	1
	November	0.000500	0.000500	0.000500	0.02	0.06	1
	December	0.000500	0.000500	0.000500	0.02	0.06	1
Closure (2043-2060)	January	0.000500	0.000500	0.000500	0.02	0.06	1
	February	0.000500	0.000500	0.000500	0.02	0.06	1
	March	0.000500	0.000500	0.000500	0.02	0.06	1
	April	0.000499	0.000499	0.000499	0.02	0.06	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.02	0.06	1
	July	0.000500	0.000500	0.000500	0.02	0.06	1
	August	0.000500	0.000500	0.000500	0.02	0.06	1
	September	0.000500	0.000500	0.000500	0.02	0.06	1
	October	0.000500	0.000500	0.000500	0.02	0.06	1
	November	0.000500	0.000500	0.000500	0.02	0.06	1
	December	0.000500	0.000500	0.000500	0.02	0.06	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are chloride dependent

Appendix 8-G4aa. M20 Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE	Maximum Predicted vs. BC MOE	Maximum Predicted vs. BC DWQG
		30-Day Mean Guideline	Maximum Guideline	
Construction (2015-2017)	January	0.0250	0.00833	0.000500
	February	0.0250	0.00833	0.000500
	March	0.0250	0.00833	0.000500
	April	0.0250	0.00833	0.000500
	May	0.0250	0.00832	0.000499
	June	0.0250	0.00832	0.000499
	July	0.0249	0.00830	0.000498
	August	0.0250	0.00833	0.000500
	September	0.0250	0.00833	0.000500
	October	0.0250	0.00833	0.000500
	November	0.0250	0.00833	0.000500
	December	0.0250	0.00833	0.000500
Operations (2018-2042)	January	0.0250	0.00833	0.000500
	February	0.0250	0.00833	0.000500
	March	0.0250	0.00833	0.000500
	April	0.0249	0.00833	0.000500
	May	0.0250	0.00833	0.000500
	June	0.0250	0.00833	0.000500
	July	0.0250	0.00833	0.000500
	August	0.0250	0.00833	0.000500
	September	0.0250	0.00833	0.000500
	October	0.0250	0.00833	0.000500
	November	0.0250	0.00833	0.000500
	December	0.0250	0.00833	0.000500
Closure (2043-2060)	January	0.0250	0.00833	0.000500
	February	0.0250	0.00833	0.000500
	March	0.0250	0.00833	0.000500
	April	0.0250	0.00832	0.000499
	May	0.0250	0.00833	0.000500
	June	0.0250	0.00833	0.000500
	July	0.0250	0.00833	0.000500
	August	0.0250	0.00833	0.000500
	September	0.0250	0.00833	0.000500
	October	0.0250	0.00833	0.000500
	November	0.0250	0.00833	0.000500
	December	0.0250	0.00833	0.000500

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are chloride dependent*

Appendix 8-G4ab. M20 Creek Hazard Quotients for Ammonia, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Ammonia Concentration			BC MOE 30-Day	BC MOE	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum	Mean	Maximum		
Construction (2015-2017)	January	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	February	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	March	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	April	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	May	0.0147	0.0147	0.0147	0.396	2.91	0.0370	0.00504
	June	0.00664	0.00664	0.00665	0.396	2.91	0.0168	0.00228
	July	0.00517	0.00517	0.00517	0.396	2.91	0.0131	0.00178
	August	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	September	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	October	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	November	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	December	0.00540	0.00540	0.00540	0.396	2.91	0.0136	0.00186
Operations (2018-2042)	January	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	February	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	March	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	April	0.00250	0.00250	0.00255	0.396	2.91	0.00631	0.000876
	May	0.0147	0.0147	0.0147	0.396	2.91	0.0371	0.00505
	June	0.00665	0.00665	0.00665	0.396	2.91	0.0168	0.00228
	July	0.00517	0.00517	0.00517	0.396	2.91	0.0131	0.00178
	August	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	September	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	October	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	November	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	December	0.00540	0.00540	0.00540	0.396	2.91	0.0136	0.00186
Closure (2043-2060)	January	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	February	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	March	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	April	0.00250	0.00250	0.00250	0.396	2.91	0.00630	0.000858
	May	0.0147	0.0147	0.0147	0.396	2.91	0.0371	0.00505
	June	0.00665	0.00665	0.00665	0.396	2.91	0.0168	0.00228
	July	0.00517	0.00517	0.00517	0.396	2.91	0.0131	0.00178
	August	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	September	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	October	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	November	0.00250	0.00250	0.00250	0.396	2.91	0.00631	0.000859
	December	0.00540	0.00540	0.00540	0.396	2.91	0.0136	0.001855

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH and temperature dependent

Appendix 8-G4ac. M20 Creek Hazard Quotients for Sulphate, Base Case

Project Phase	Month	Predicted WQ			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Sulphate Concentration						
		Median	Mean	Maximum				
Construction (2015-2017)	January	53.8	53.8	53.8	429	500	0.126	0.108
	February	48.6	48.6	48.6	429	500	0.113	0.0972
	March	53.0	53.0	53.0	429	500	0.124	0.106
	April	51.6	51.6	51.6	429	500	0.120	0.103
	May	20.0	20.0	20.0	309	500	0.0647	0.0400
	June	25.1	25.1	25.1	309	500	0.0813	0.0503
	July	42.8	42.8	42.8	309	500	0.139	0.0857
	August	48.3	48.3	48.3	429	500	0.113	0.0966
	September	55.6	55.6	55.6	429	500	0.130	0.111
	October	53.9	53.9	53.9	429	500	0.126	0.108
	November	52.6	52.6	52.6	429	500	0.123	0.105
	December	53.8	53.8	53.8	429	500	0.125	0.108
Operations (2018-2042)	January	53.9	53.9	53.9	429	500	0.126	0.108
	February	48.6	48.6	48.6	429	500	0.113	0.0973
	March	53.1	53.1	53.1	429	500	0.124	0.106
	April	51.6	51.6	51.6	429	500	0.120	0.103
	May	20.0	20.0	20.0	309	500	0.0648	0.0400
	June	25.2	25.2	25.2	309	500	0.0815	0.0504
	July	43.0	43.0	43.0	309	500	0.139	0.0861
	August	48.3	48.3	48.3	429	500	0.113	0.0966
	September	55.7	55.7	55.7	429	500	0.130	0.111
	October	54.0	54.0	54.0	429	500	0.126	0.108
	November	52.7	52.7	52.7	429	500	0.123	0.105
	December	53.8	53.8	53.8	429	500	0.126	0.108
Closure (2043-2060)	January	53.9	53.9	53.9	429	500	0.126	0.108
	February	48.7	48.7	48.7	429	500	0.113	0.0973
	March	53.1	53.1	53.1	429	500	0.124	0.106
	April	51.6	51.6	51.6	429	500	0.120	0.103
	May	20.0	20.0	20.0	309	500	0.0649	0.0401
	June	25.2	25.2	25.2	309	500	0.0816	0.0504
	July	43.1	43.1	43.1	309	500	0.139	0.0861
	August	48.3	48.3	48.3	429	500	0.113	0.0966
	September	55.7	55.7	55.7	429	500	0.130	0.111
	October	54.0	54.0	54.0	429	500	0.126	0.108
	November	52.7	52.7	52.7	429	500	0.123	0.105
	December	53.9	53.9	53.9	429	500	0.126	0.108

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G5
M19A Creek

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G5a. M19A Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality						Aquatic Life Guidelines for Dissolved Aluminum ¹	
		Dissolved Aluminum Concentration			Total Aluminum Concentration			BC MOE 30-Day Mean	BC MOE Maximum
		Median	Mean	Maximum	Median	Mean	Maximum		
Construction (2015-2017)	January	0.00150	0.00150	0.00150	0.0823	0.0823	0.0823	0.05	0.10
	February	0.00150	0.00150	0.00150	0.0595	0.0595	0.0595	0.05	0.10
	March	0.00150	0.00150	0.00150	0.0173	0.0173	0.0173	0.05	0.10
	April	0.00150	0.00150	0.00150	0.179	0.179	0.179	0.05	0.10
	May	0.00485	0.00485	0.00485	0.154	0.154	0.154	0.05	0.10
	June	0.00150	0.00150	0.00150	0.0302	0.0302	0.0302	0.05	0.10
	July	0.00150	0.00150	0.00150	0.0168	0.0168	0.0168	0.05	0.10
	August	0.00150	0.00150	0.00150	0.00930	0.00930	0.00930	0.05	0.10
	September	0.00150	0.00150	0.00150	0.00810	0.00810	0.00810	0.05	0.10
	October	0.00150	0.00150	0.00150	0.0318	0.0318	0.0318	0.05	0.10
	November	0.00150	0.00150	0.00150	0.0105	0.0105	0.0105	0.05	0.10
	December	0.00150	0.00150	0.00150	0.0100	0.0100	0.0100	0.05	0.10
Operations (2018-2042)	January	0.00537	0.00534	0.00894	0.0861	0.0861	0.0897	0.05	0.10
	February	0.00492	0.00489	0.00806	0.0629	0.0629	0.0660	0.05	0.10
	March	0.00436	0.00435	0.00699	0.0202	0.0201	0.0228	0.05	0.10
	April	0.00179	0.00179	0.00206	0.179	0.179	0.179	0.05	0.10
	May	0.00515	0.00514	0.00541	0.154	0.154	0.155	0.05	0.10
	June	0.00205	0.00205	0.00255	0.0307	0.0307	0.0312	0.05	0.10
	July	0.00219	0.00220	0.00282	0.0175	0.0175	0.0181	0.05	0.10
	August	0.00206	0.00207	0.00257	0.00986	0.00986	0.01036	0.05	0.10
	September	0.00480	0.00483	0.00778	0.0114	0.0114	0.0144	0.05	0.10
	October	0.00338	0.00340	0.00508	0.0337	0.0337	0.0353	0.05	0.10
	November	0.00354	0.00357	0.00538	0.0125	0.0126	0.0144	0.05	0.10
	December	0.00402	0.00407	0.00629	0.0125	0.0126	0.0148	0.05	0.10
Closure (2043-2060)	January	0.0172	0.0174	0.0195	0.0978	0.0979	0.1001	0.05	0.10
	February	0.0193	0.0193	0.0199	0.0772	0.0772	0.0778	0.05	0.10
	March	0.0174	0.0174	0.0176	0.0332	0.0332	0.0334	0.05	0.10
	April	0.00300	0.00300	0.00300	0.180	0.180	0.180	0.05	0.10
	May	0.00632	0.00632	0.00632	0.155	0.155	0.155	0.05	0.10
	June	0.00420	0.00420	0.00420	0.0328	0.0328	0.0328	0.05	0.10
	July	0.00488	0.00488	0.00488	0.0201	0.0201	0.0201	0.05	0.10
	August	0.00423	0.00423	0.00423	0.0120	0.0120	0.0120	0.05	0.10
	September	0.0135	0.0135	0.0135	0.0201	0.0201	0.0201	0.05	0.10
	October	0.0109	0.0109	0.0109	0.0412	0.0412	0.0412	0.05	0.10
	November	0.0110	0.0110	0.0110	0.0200	0.0200	0.0200	0.05	0.10
	December	0.0125	0.0125	0.0125	0.0210	0.0210	0.0210	0.05	0.10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH dependent

Appendix 8-G5a. M19A Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	BC MOE Working Water Quality Guidelines for Wildlife Water Supply for Total Aluminum BC MOE 30-Day Mean	Hazard Quotient relative to Aquatic Life Guideline for Dissolved Aluminum		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply for Total Aluminum
			Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	5	0.0300	0.0150	0.0165
	February	5	0.0300	0.0150	0.0119
	March	5	0.0300	0.0150	0.00346
	April	5	0.0300	0.0150	0.0358
	May	5	0.0970	0.0485	0.0308
	June	5	0.0300	0.0150	0.00604
	July	5	0.0300	0.0150	0.00336
	August	5	0.0300	0.0150	0.00186
	September	5	0.0300	0.0150	0.00162
	October	5	0.0300	0.0150	0.00636
	November	5	0.0300	0.0150	0.00210
	December	5	0.0300	0.0150	0.00200
Operations (2018-2042)	January	5	0.107	0.0894	0.0172
	February	5	0.0978	0.0806	0.0126
	March	5	0.0870	0.0699	0.00403
	April	5	0.0358	0.0206	0.0358
	May	5	0.103	0.0541	0.0309
	June	5	0.0410	0.0255	0.00615
	July	5	0.0439	0.0282	0.00350
	August	5	0.0413	0.0257	0.00197
	September	5	0.0966	0.0778	0.00228
	October	5	0.0681	0.0508	0.00674
	November	5	0.0714	0.0538	0.00251
	December	5	0.0814	0.0629	0.00251
Closure (2043-2060)	January	5	0.347	0.195	0.0196
	February	5	0.386	0.199	0.0154
	March	5	0.349	0.176	0.00665
	April	5	0.0600	0.0300	0.0360
	May	5	0.126	0.0632	0.0311
	June	5	0.0840	0.0420	0.00657
	July	5	0.0976	0.0488	0.00403
	August	5	0.0845	0.0423	0.00240
	September	5	0.270	0.135	0.00402
	October	5	0.219	0.109	0.00824
	November	5	0.220	0.110	0.00399
	December	5	0.250	0.125	0.00420

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH dependent

Appendix 8-G5b. M19A Creek Hazard Quotients for Total Antimony, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Antimony Concentration			BC MOE Working Guideline	BC Working DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC Working DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	February	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	March	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	April	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	May	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	June	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	July	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	August	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	September	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	October	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	November	0.000140	0.000140	0.000140	0.020	0.014	0.00700	0.0100
	December	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
Operations (2018-2042)	January	0.000127	0.000125	0.000204	0.020	0.014	0.00627	0.0146
	February	0.000118	0.000117	0.000185	0.020	0.014	0.00583	0.0132
	March	0.000107	0.000106	0.000163	0.020	0.014	0.00530	0.0117
	April	0.0000558	0.0000557	0.0000616	0.020	0.014	0.00279	0.00440
	May	0.0000559	0.0000558	0.0000617	0.020	0.014	0.00279	0.00441
	June	0.0000609	0.0000608	0.0000716	0.020	0.014	0.00304	0.00511
	July	0.0000638	0.0000637	0.0000772	0.020	0.014	0.00318	0.00552
	August	0.0000612	0.0000611	0.0000721	0.020	0.014	0.00306	0.00515
	September	0.000116	0.000116	0.000179	0.020	0.014	0.00578	0.0128
	October	0.0000875	0.0000876	0.000124	0.020	0.014	0.00438	0.00883
	November	0.000181	0.000181	0.000220	0.020	0.014	0.00904	0.0157
	December	0.000100	0.000101	0.000148	0.020	0.014	0.00503	0.0106
Closure (2043-2060)	January	0.000273	0.000277	0.000351	0.020	0.014	0.0139	0.0251
	February	0.000302	0.000303	0.000322	0.020	0.014	0.0152	0.0230
	March	0.000276	0.000277	0.000281	0.020	0.014	0.0138	0.0201
	April	0.0000713	0.0000713	0.0000713	0.020	0.014	0.00356	0.00509
	May	0.0000709	0.0000709	0.0000709	0.020	0.014	0.00355	0.00507
	June	0.0000883	0.0000883	0.0000883	0.020	0.014	0.00441	0.00630
	July	0.0000979	0.0000979	0.0000979	0.020	0.014	0.00490	0.00700
	August	0.0000887	0.0000887	0.0000887	0.020	0.014	0.00443	0.00633
	September	0.000220	0.000220	0.000220	0.020	0.014	0.0110	0.0157
	October	0.000184	0.000184	0.000184	0.020	0.014	0.00920	0.0131
	November	0.000275	0.000275	0.000275	0.020	0.014	0.0137	0.0196
	December	0.000206	0.000206	0.000206	0.020	0.014	0.0103	0.0147

Notes:

All concentrations in mg/L.

DWQG = Drinking water quality guideline

Grey shading indicates a hazard quotient > 1.0

Appendix 8-G5c. M19A Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Arsenic Concentration						
		Median	Mean	Maximum	BC MOE Maximum	BC DWQG	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.000400	0.000400	0.000400	0.005	0.025	0.025	0.0800
	February	0.000220	0.000220	0.000220	0.005	0.025	0.025	0.0440
	March	0.000210	0.000210	0.000210	0.005	0.025	0.025	0.0420
	April	0.000290	0.000290	0.000290	0.005	0.025	0.025	0.0580
	May	0.000265	0.000265	0.000265	0.005	0.025	0.025	0.0530
	June	0.000240	0.000240	0.000240	0.005	0.025	0.025	0.0480
	July	0.000270	0.000270	0.000270	0.005	0.025	0.025	0.0540
	August	0.000250	0.000250	0.000250	0.005	0.025	0.025	0.0500
	September	0.000280	0.000280	0.000280	0.005	0.025	0.025	0.0560
	October	0.000240	0.000240	0.000240	0.005	0.025	0.025	0.0480
	November	0.000450	0.000450	0.000450	0.005	0.025	0.025	0.0900
	December	0.000360	0.000360	0.000360	0.005	0.025	0.025	0.0720
Operations (2018-2042)	January	0.000443	0.000443	0.000489	0.005	0.025	0.025	0.0978
	February	0.000258	0.000258	0.000298	0.005	0.025	0.025	0.0597
	March	0.000242	0.000242	0.000276	0.005	0.025	0.025	0.0551
	April	0.000293	0.000293	0.000297	0.005	0.025	0.025	0.0593
	May	0.000268	0.000268	0.000272	0.005	0.025	0.025	0.0543
	June	0.000246	0.000246	0.000252	0.005	0.025	0.025	0.0505
	July	0.000278	0.000278	0.000286	0.005	0.025	0.025	0.0571
	August	0.000256	0.000256	0.000263	0.005	0.025	0.025	0.0525
	September	0.000318	0.000318	0.000355	0.005	0.025	0.025	0.0711
	October	0.000262	0.000262	0.000283	0.005	0.025	0.025	0.0566
	November	0.000473	0.000473	0.000496	0.005	0.025	0.025	0.0993
	December	0.000389	0.000389	0.000417	0.005	0.025	0.025	0.0835
Closure (2043-2060)	January	0.000455	0.000459	0.000529	0.005	0.025	0.025	0.106
	February	0.000283	0.000284	0.000301	0.005	0.025	0.025	0.0602
	March	0.000266	0.000267	0.000271	0.005	0.025	0.025	0.0541
	April	0.000295	0.000295	0.000295	0.005	0.025	0.025	0.0590
	May	0.000270	0.000270	0.000270	0.005	0.025	0.025	0.0539
	June	0.000249	0.000249	0.000249	0.005	0.025	0.025	0.0498
	July	0.000281	0.000281	0.000281	0.005	0.025	0.025	0.0563
	August	0.000259	0.000259	0.000259	0.005	0.025	0.025	0.0518
	September	0.000322	0.000322	0.000322	0.005	0.025	0.025	0.0644
	October	0.000273	0.000273	0.000273	0.005	0.025	0.025	0.0546
	November	0.000483	0.000483	0.000483	0.005	0.025	0.025	0.0966
	December	0.000398	0.000398	0.000398	0.005	0.025	0.025	0.0797

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5c. M19A Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0160	0.0160
	February	0.00880	0.00880
	March	0.00840	0.00840
	April	0.0116	0.0116
	May	0.0106	0.0106
	June	0.00960	0.00960
	July	0.0108	0.0108
	August	0.0100	0.0100
	September	0.0112	0.0112
	October	0.00960	0.00960
	November	0.0180	0.0180
	December	0.0144	0.0144
Operations (2018-2042)	January	0.0196	0.0196
	February	0.0119	0.0119
	March	0.0110	0.0110
	April	0.0119	0.0119
	May	0.0109	0.0109
	June	0.0101	0.0101
	July	0.0114	0.0114
	August	0.0105	0.0105
	September	0.0142	0.0142
	October	0.0113	0.0113
	November	0.0199	0.0199
	December	0.0167	0.0167
Closure (2043-2060)	January	0.0212	0.0212
	February	0.0120	0.0120
	March	0.0108	0.0108
	April	0.0118	0.0118
	May	0.0108	0.0108
	June	0.00996	0.00996
	July	0.0113	0.0113
	August	0.0104	0.0104
	September	0.0129	0.0129
	October	0.0109	0.0109
	November	0.0193	0.0193
	December	0.0159	0.0159

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5d. M19A Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Barium Concentration			BC MOE 30-Day Mean Working Guideline	BC MOE Maximum Working Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.136	0.136	0.136	1	5	1
	February	0.157	0.157	0.157	1	5	1
	March	0.160	0.160	0.160	1	5	1
	April	0.103	0.103	0.103	1	5	1
	May	0.118	0.118	0.118	1	5	1
	June	0.113	0.113	0.113	1	5	1
	July	0.139	0.139	0.139	1	5	1
	August	0.150	0.150	0.150	1	5	1
	September	0.192	0.192	0.192	1	5	1
	October	0.175	0.175	0.175	1	5	1
	November	0.192	0.192	0.192	1	5	1
	December	0.182	0.182	0.182	1	5	1
Operations (2018-2042)	January	0.159	0.159	0.183	1	5	1
	February	0.178	0.177	0.198	1	5	1
	March	0.177	0.177	0.194	1	5	1
	April	0.105	0.105	0.106	1	5	1
	May	0.120	0.120	0.121	1	5	1
	June	0.116	0.116	0.119	1	5	1
	July	0.143	0.143	0.147	1	5	1
	August	0.153	0.153	0.157	1	5	1
	September	0.212	0.212	0.231	1	5	1
	October	0.186	0.186	0.197	1	5	1
	November	0.204	0.204	0.216	1	5	1
	December	0.197	0.197	0.212	1	5	1
Closure (2043-2060)	January	0.313	0.312	0.313	1	5	1
	February	0.358	0.358	0.358	1	5	1
	March	0.340	0.340	0.340	1	5	1
	April	0.120	0.120	0.120	1	5	1
	May	0.135	0.135	0.135	1	5	1
	June	0.143	0.143	0.143	1	5	1
	July	0.177	0.177	0.177	1	5	1
	August	0.181	0.181	0.181	1	5	1
	September	0.327	0.327	0.327	1	5	1
	October	0.282	0.282	0.282	1	5	1
	November	0.299	0.299	0.299	1	5	1
	December	0.306	0.306	0.306	1	5	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5d. M19A Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Working Guideline	Maximum Predicted vs. BC MOE Maximum Working Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.136	0.0272	0.136
	February	0.157	0.0314	0.157
	March	0.160	0.0320	0.160
	April	0.103	0.0206	0.103
	May	0.118	0.0236	0.118
	June	0.113	0.0226	0.113
	July	0.139	0.0278	0.139
	August	0.150	0.0300	0.150
	September	0.192	0.0384	0.192
	October	0.175	0.0350	0.175
	November	0.192	0.0384	0.192
	December	0.182	0.0364	0.182
Operations (2018-2042)	January	0.159	0.0365	0.183
	February	0.177	0.0396	0.198
	March	0.177	0.0389	0.194
	April	0.105	0.0213	0.106
	May	0.120	0.0243	0.121
	June	0.116	0.0239	0.119
	July	0.143	0.0294	0.147
	August	0.153	0.0313	0.157
	September	0.212	0.0462	0.231
	October	0.186	0.0394	0.197
	November	0.204	0.0432	0.216
	December	0.197	0.0423	0.212
Closure (2043-2060)	January	0.312	0.0627	0.313
	February	0.358	0.0716	0.358
	March	0.340	0.0680	0.340
	April	0.120	0.0240	0.120
	May	0.135	0.0269	0.135
	June	0.143	0.0287	0.143
	July	0.177	0.0354	0.177
	August	0.181	0.0361	0.181
	September	0.327	0.0654	0.327
	October	0.282	0.0563	0.282
	November	0.299	0.0598	0.299
	December	0.306	0.0612	0.306

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5e. M19A Creek Hazard Quotients for Total Beryllium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Beryllium Concentration			BC MOE Working Guideline	BC DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	February	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	March	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	April	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	May	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	June	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	July	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	August	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	September	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	October	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	November	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	December	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
Operations (2018-2042)	January	0.0000530	0.0000531	0.0000558	0.0053	0.004	0.0105	0.0140
	February	0.0000527	0.0000527	0.0000551	0.0053	0.004	0.0104	0.0138
	March	0.0000523	0.0000523	0.0000542	0.0053	0.004	0.0102	0.0136
	April	0.0000502	0.0000502	0.0000504	0.0053	0.004	0.00951	0.0126
	May	0.0000502	0.0000502	0.0000504	0.0053	0.004	0.00951	0.0126
	June	0.0000504	0.0000504	0.0000507	0.0053	0.004	0.00957	0.0127
	July	0.0000505	0.0000505	0.0000510	0.0053	0.004	0.00961	0.0127
	August	0.0000504	0.0000504	0.0000508	0.0053	0.004	0.00958	0.0127
	September	0.0000527	0.0000526	0.0000547	0.0053	0.004	0.0103	0.0137
	October	0.0000515	0.0000515	0.0000526	0.0053	0.004	0.00993	0.0132
	November	0.0000517	0.0000516	0.0000528	0.0053	0.004	0.0100	0.0132
	December	0.0000521	0.0000520	0.0000535	0.0053	0.004	0.0101	0.0134
Closure (2043-2060)	January	0.0000795	0.0000792	0.0000795	0.0053	0.004	0.0150	0.0199
	February	0.0000834	0.0000833	0.0000834	0.0053	0.004	0.0157	0.0208
	March	0.0000798	0.0000798	0.0000798	0.0053	0.004	0.0151	0.0200
	April	0.0000527	0.0000527	0.0000527	0.0053	0.004	0.00995	0.0132
	May	0.0000527	0.0000527	0.0000527	0.0053	0.004	0.00994	0.0132
	June	0.0000550	0.0000550	0.0000550	0.0053	0.004	0.0104	0.0137
	July	0.0000563	0.0000563	0.0000563	0.0053	0.004	0.0106	0.0141
	August	0.0000550	0.0000550	0.0000550	0.0053	0.004	0.0104	0.0138
	September	0.0000725	0.0000725	0.0000725	0.0053	0.004	0.0137	0.0181
	October	0.0000676	0.0000676	0.0000676	0.0053	0.004	0.0128	0.0169
	November	0.0000677	0.0000677	0.0000677	0.0053	0.004	0.0128	0.0169
	December	0.0000706	0.0000706	0.0000706	0.0053	0.004	0.0133	0.0176

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5f. M19A Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Boron Concentration						
		Median	Mean	Maximum	BC MOE Maximum	BC DWQG	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0100	0.0100	0.0100	1.2	5	5	0.00833
	February	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	March	0.0120	0.0120	0.0120	1.2	5	5	0.0100
	April	0.0130	0.0130	0.0130	1.2	5	5	0.0108
	May	0.0135	0.0135	0.0135	1.2	5	5	0.0113
	June	0.0145	0.0145	0.0145	1.2	5	5	0.0121
	July	0.0160	0.0160	0.0160	1.2	5	5	0.0133
	August	0.0190	0.0190	0.0190	1.2	5	5	0.0158
	September	0.0170	0.0170	0.0170	1.2	5	5	0.0142
	October	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	November	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	December	0.0160	0.0160	0.0160	1.2	5	5	0.0133
Operations (2018-2042)	January	0.01375	0.01366	0.0174	1.2	5	5	0.0145
	February	0.0173	0.0172	0.0205	1.2	5	5	0.0171
	March	0.0148	0.0147	0.0174	1.2	5	5	0.0145
	April	0.0133	0.0133	0.0135	1.2	5	5	0.0113
	May	0.0138	0.0138	0.0141	1.2	5	5	0.0117
	June	0.0150	0.0150	0.0155	1.2	5	5	0.0129
	July	0.0167	0.0167	0.0173	1.2	5	5	0.0144
	August	0.0195	0.0195	0.0200	1.2	5	5	0.0167
	September	0.0202	0.0202	0.0232	1.2	5	5	0.0193
	October	0.0158	0.0158	0.0175	1.2	5	5	0.0146
	November	0.0160	0.0160	0.0178	1.2	5	5	0.0148
	December	0.0184	0.0185	0.0207	1.2	5	5	0.0173
Closure (2043-2060)	January	0.0325	0.0325	0.0325	1.2	5	5	0.0271
	February	0.0395	0.0395	0.0395	1.2	5	5	0.0329
	March	0.0349	0.0349	0.0349	1.2	5	5	0.0291
	April	0.0151	0.0151	0.0151	1.2	5	5	0.0126
	May	0.0156	0.0156	0.0156	1.2	5	5	0.0130
	June	0.0184	0.0184	0.0184	1.2	5	5	0.0153
	July	0.0208	0.0208	0.0208	1.2	5	5	0.0174
	August	0.0229	0.0229	0.0229	1.2	5	5	0.0191
	September	0.0341	0.0341	0.0341	1.2	5	5	0.0284
	October	0.0275	0.0275	0.0275	1.2	5	5	0.0230
	November	0.0276	0.0276	0.0276	1.2	5	5	0.0230
	December	0.0318	0.0318	0.0318	1.2	5	5	0.0265

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5f. M19A Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.00200	0.00200
	February	0.00280	0.00280
	March	0.00240	0.00240
	April	0.00260	0.00260
	May	0.00270	0.00270
	June	0.00290	0.00290
	July	0.00320	0.00320
	August	0.00380	0.00380
	September	0.00340	0.00340
	October	0.00280	0.00280
	November	0.00280	0.00280
	December	0.00320	0.00320
Operations (2018-2042)	January	0.00348	0.00348
	February	0.00410	0.00410
	March	0.00349	0.00349
	April	0.00271	0.00271
	May	0.00281	0.00281
	June	0.00311	0.00311
	July	0.00346	0.00346
	August	0.00401	0.00401
	September	0.00464	0.00464
	October	0.00350	0.00350
	November	0.00356	0.00356
	December	0.00414	0.00414
Closure (2043-2060)	January	0.00650	0.00650
	February	0.00790	0.00790
	March	0.00698	0.00698
	April	0.00303	0.00303
	May	0.00312	0.00312
	June	0.00367	0.00367
	July	0.00417	0.00417
	August	0.00458	0.00458
	September	0.00682	0.00682
	October	0.00551	0.00551
	November	0.00552	0.00552
	December	0.00635	0.00635

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5g. M19A Creek Hazard Quotients for Total Cadmium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Cadmium Concentration						
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000220	0.0000220	0.0000220	0.0001	0.005	0.16617	0.00440
	February	0.0000200	0.0000200	0.0000200	0.0001	0.005	0.13770	0.00400
	March	0.0000175	0.0000175	0.0000175	0.0002	0.005	0.11336	0.00350
	April	0.0000280	0.0000280	0.0000280	0.0001	0.005	0.34459	0.00560
	May	0.0000200	0.0000200	0.0000200	0.0001	0.005	0.21746	0.00400
	June	0.00000800	0.00000800	0.00000800	0.0001	0.005	0.104496	0.00160
	July	0.0000140	0.0000140	0.0000140	0.0001	0.005	0.131163	0.00280
	August	0.0000120	0.0000120	0.0000120	0.0001	0.005	0.109533	0.00240
	September	0.0000130	0.0000130	0.0000130	0.0001	0.005	0.092952	0.00260
	October	0.0000130	0.0000130	0.0000130	0.0001	0.005	0.092952	0.00260
	November	0.0000140	0.0000140	0.0000140	0.0002	0.005	0.085782	0.00280
	December	0.0000140	0.0000140	0.0000140	0.0002	0.005	0.086599	0.00280
Operations (2018-2042)	January	0.00002459	0.00002476	0.0000272	0.0001	0.005	0.20521	0.00543
	February	0.0000223	0.0000224	0.0000245	0.0001	0.005	0.16890	0.00491
	March	0.0000194	0.0000195	0.0000213	0.0002	0.005	0.13785	0.00426
	April	0.0000282	0.0000282	0.0000284	0.0001	0.005	0.34897	0.00567
	May	0.0000202	0.0000202	0.0000204	0.0001	0.005	0.22147	0.00407
	June	0.00000836	0.00000839	0.00000871	0.0001	0.005	0.113736	0.00174
	July	0.0000145	0.0000145	0.0000149	0.0001	0.005	0.139461	0.00298
	August	0.0000124	0.0000124	0.0000127	0.0001	0.005	0.116054	0.00254
	September	0.0000152	0.0000154	0.0000172	0.0001	0.005	0.12319	0.00345
	October	0.00001425	0.00001434	0.0000154	0.0001	0.005	0.110081	0.00308
	November	0.0000154	0.0000155	0.0000166	0.0002	0.005	0.101618	0.00332
	December	0.0000157	0.0000158	0.0000172	0.0002	0.005	0.10630	0.00344
Closure (2043-2060)	January	0.0000431	0.0000429	0.0000431	0.0001	0.005	0.32533	0.00861
	February	0.0000438	0.0000438	0.0000438	0.0001	0.005	0.30184	0.00877
	March	0.0000388	0.0000388	0.0000388	0.0002	0.005	0.25156	0.00777
	April	0.0000300	0.0000300	0.0000300	0.0001	0.005	0.36870	0.00599
	May	0.0000219	0.0000219	0.0000219	0.0001	0.005	0.23861	0.00439
	June	0.0000116	0.0000116	0.0000116	0.0001	0.005	0.151609	0.00232
	July	0.0000185	0.0000185	0.0000185	0.0001	0.005	0.17340	0.00370
	August	0.0000156	0.0000156	0.0000156	0.0001	0.005	0.14272	0.00313
	September	0.0000291	0.0000291	0.0000291	0.0001	0.005	0.20804	0.00582
	October	0.0000256	0.0000256	0.0000256	0.0001	0.005	0.18329	0.00513
	November	0.0000267	0.0000267	0.0000267	0.0002	0.005	0.16365	0.00534
	December	0.0000287	0.0000287	0.0000287	0.0002	0.005	0.17770	0.00575

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G5h. M19A Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Chromium Concentration			CCME Cr VI Guideline	CCME CR III Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000160	0.000160	0.000160	0.001	0.0089	0.05
	February	0.000220	0.000220	0.000220	0.001	0.0089	0.05
	March	0.0000750	0.0000750	0.0000750	0.001	0.0089	0.05
	April	0.000360	0.000360	0.000360	0.001	0.0089	0.05
	May	0.000340	0.000340	0.000340	0.001	0.0089	0.05
	June	0.000140	0.000140	0.000140	0.001	0.0089	0.05
	July	0.0000500	0.0000500	0.0000500	0.001	0.0089	0.05
	August	0.000170	0.000170	0.000170	0.001	0.0089	0.05
	September	0.000110	0.000110	0.000110	0.001	0.0089	0.05
	October	0.0000500	0.0000500	0.0000500	0.001	0.0089	0.05
	November	0.000120	0.000120	0.000120	0.001	0.0089	0.05
	December	0.000210	0.000210	0.000210	0.001	0.0089	0.05
Operations (2018-2042)	January	0.0001681	0.0001678	0.000175	0.001	0.0089	0.05
	February	0.000227	0.000227	0.000234	0.001	0.0089	0.05
	March	0.0000810	0.0000808	0.0000864	0.001	0.0089	0.05
	April	0.000360	0.000360	0.000361	0.001	0.0089	0.05
	May	0.000340	0.000340	0.000341	0.001	0.0089	0.05
	June	0.000141	0.000141	0.000142	0.001	0.0089	0.05
	July	0.0000514	0.0000514	0.0000527	0.001	0.0089	0.05
	August	0.000171	0.000171	0.000172	0.001	0.0089	0.05
	September	0.000117	0.000117	0.000123	0.001	0.0089	0.05
	October	0.0000539	0.0000539	0.0000574	0.001	0.0089	0.05
	November	0.000124	0.000124	0.000128	0.001	0.0089	0.05
	December	0.000215	0.000215	0.000220	0.001	0.0089	0.05
Closure (2043-2060)	January	0.000201	0.000201	0.000202	0.001	0.0089	0.05
	February	0.000266	0.000266	0.000266	0.001	0.0089	0.05
	March	0.000117	0.000117	0.000117	0.001	0.0089	0.05
	April	0.000363	0.000363	0.000363	0.001	0.0089	0.05
	May	0.000343	0.000343	0.000343	0.001	0.0089	0.05
	June	0.000147	0.000147	0.000147	0.001	0.0089	0.05
	July	0.0000587	0.0000587	0.0000587	0.001	0.0089	0.05
	August	0.000177	0.000177	0.000177	0.001	0.0089	0.05
	September	0.000141	0.000141	0.000141	0.001	0.0089	0.05
	October	0.000075	0.000075	0.000075	0.001	0.0089	0.05
	November	0.000145	0.000145	0.000145	0.001	0.0089	0.05
	December	0.000238	0.000238	0.000238	0.001	0.0089	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

CCME = Canadian Council of Ministers of the Environment

DWQG = Drinking water quality guideline

Appendix 8-G5h. M19A Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Maximum Predicted vs. CCME Cr VI Guideline	Maximum Predicted vs. CCME Cr III Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.160	0.0180	0.00320
	February	0.220	0.0247	0.00440
	March	0.0750	0.00843	0.00150
	April	0.360	0.0404	0.00720
	May	0.340	0.0382	0.00680
	June	0.140	0.0157	0.00280
	July	0.0500	0.00562	0.00100
	August	0.170	0.0191	0.00340
	September	0.110	0.0124	0.00220
	October	0.0500	0.00562	0.00100
	November	0.120	0.0135	0.00240
	December	0.210	0.0236	0.00420
Operations (2018-2042)	January	0.175	0.0197	0.00351
	February	0.234	0.0262	0.00467
	March	0.0864	0.00971	0.00173
	April	0.361	0.0406	0.00722
	May	0.341	0.0383	0.00682
	June	0.142	0.0160	0.00284
	July	0.0527	0.00592	0.00105
	August	0.172	0.0193	0.00344
	September	0.123	0.0138	0.00246
	October	0.0574	0.00645	0.00115
	November	0.128	0.0144	0.00256
	December	0.220	0.0247	0.00440
Closure (2043-2060)	January	0.202	0.0227	0.00403
	February	0.266	0.0299	0.00532
	March	0.117	0.0131	0.00233
	April	0.363	0.0408	0.00726
	May	0.343	0.0386	0.00686
	June	0.147	0.0165	0.00294
	July	0.0587	0.00660	0.00117
	August	0.177	0.0199	0.00354
	September	0.141	0.0158	0.00282
	October	0.0746	0.00838	0.00149
	November	0.145	0.0162	0.00289
	December	0.238	0.0268	0.00477

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

CCME = Canadian Council of Ministers of the Environment

DWQG = Drinking water quality guideline

Appendix 8-G5i. M19A Creek Hazard Quotients for Total Cobalt, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Cobalt Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000330	0.000330	0.000330	0.004	0.110	0.0825	0.00300
	February	0.000500	0.000500	0.000500	0.004	0.110	0.0125	0.000455
	March	0.000155	0.000155	0.000155	0.004	0.110	0.0387	0.00141
	April	0.000180	0.000180	0.000180	0.004	0.110	0.0450	0.00164
	May	0.000115	0.000115	0.000115	0.004	0.110	0.0287	0.00105
	June	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	July	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	August	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	September	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	October	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	November	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	December	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
Operations (2018-2042)	January	0.000369	0.000372	0.000409	0.004	0.110	0.0930	0.00372
	February	0.000085	0.000087	0.000120	0.004	0.110	0.0218	0.00109
	March	0.000185	0.000186	0.000213	0.004	0.110	0.0465	0.00194
	April	0.000183	0.000183	0.000186	0.004	0.110	0.0458	0.00169
	May	0.000118	0.000118	0.000121	0.004	0.110	0.0295	0.00110
	June	0.0000557	0.0000559	0.0000609	0.004	0.110	0.0140	0.000554
	July	0.0000572	0.0000575	0.0000637	0.004	0.110	0.0144	0.000579
	August	0.0000558	0.0000561	0.0000611	0.004	0.110	0.0140	0.000555
	September	0.000084	0.000086	0.000115	0.004	0.110	0.0215	0.00104
	October	0.0000696	0.0000705	0.0000868	0.004	0.110	0.0176	0.000789
	November	0.0000712	0.0000722	0.0000896	0.004	0.110	0.0180	0.000815
	December	0.0000762	0.0000775	0.0000988	0.004	0.110	0.0194	0.000898
Closure (2043-2060)	January	0.000549	0.000549	0.000549	0.004	0.110	0.137	0.00499
	February	0.000299	0.000299	0.000299	0.004	0.110	0.0747	0.00272
	March	0.000377	0.000377	0.000377	0.004	0.110	0.0943	0.00343
	April	0.000201	0.000201	0.000201	0.004	0.110	0.0502	0.00182
	May	0.000135	0.000135	0.000135	0.004	0.110	0.0339	0.00123
	June	0.0000876	0.0000876	0.0000876	0.004	0.110	0.0219	0.000797
	July	0.0000972	0.0000972	0.0000972	0.004	0.110	0.0243	0.000883
	August	0.0000880	0.0000880	0.0000880	0.004	0.110	0.0220	0.000800
	September	0.000218	0.000218	0.000218	0.004	0.110	0.0545	0.00198
	October	0.000182	0.000182	0.000182	0.004	0.110	0.0454	0.00165
	November	0.000183	0.000183	0.000183	0.004	0.110	0.0456	0.00166
	December	0.000204	0.000204	0.000204	0.004	0.110	0.0509	0.00185

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5j. M19A Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹		BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration			BC MOE 30-Day Mean	BC MOE Maximum	
		Median	Mean	Maximum			30-Day Mean
Construction (2015-2017)	January	0.000540	0.000540	0.000540	0.0200	0.0491	0.3
	February	0.000250	0.000250	0.000250	0.0223	0.0545	0.3
	March	0.000425	0.000425	0.000425	0.0240	0.0583	0.3
	April	0.000870	0.000870	0.000870	0.0114	0.0287	0.3
	May	0.000735	0.000735	0.000735	0.0131	0.0328	0.3
	June	0.000595	0.000595	0.000595	0.0106	0.0269	0.3
	July	0.000550	0.000550	0.000550	0.0156	0.0387	0.3
	August	0.000250	0.000250	0.000250	0.0161	0.0398	0.3
	September	0.000250	0.000250	0.000250	0.0214	0.0522	0.3
	October	0.000670	0.000670	0.000670	0.0214	0.0522	0.3
	November	0.000610	0.000610	0.000610	0.0256	0.0621	0.3
	December	0.000250	0.000250	0.000250	0.0253	0.0614	0.3
Operations (2018-2042)	January	0.000656	0.000659	0.000764	0.0200	0.0491	0.3
	February	0.000353	0.000355	0.000447	0.0223	0.0545	0.3
	March	0.000512	0.000513	0.000590	0.0240	0.0583	0.3
	April	0.000878	0.000879	0.000886	0.0114	0.0287	0.3
	May	0.000744	0.000744	0.000751	0.0131	0.0328	0.3
	June	0.000612	0.000612	0.000626	0.0106	0.0269	0.3
	July	0.000571	0.000571	0.000589	0.0156	0.0387	0.3
	August	0.000267	0.000267	0.000282	0.0161	0.0398	0.3
	September	0.000354	0.000353	0.000439	0.0214	0.0522	0.3
	October	0.000729	0.000728	0.000777	0.0214	0.0522	0.3
	November	0.000674	0.000674	0.000726	0.0256	0.0621	0.3
	December	0.000331	0.000329	0.000394	0.0253	0.0614	0.3
Closure (2043-2060)	January	0.000915	0.000921	0.001019	0.0200	0.0491	0.3
	February	0.000675	0.000676	0.000701	0.0223	0.0545	0.3
	March	0.000804	0.000805	0.000811	0.0240	0.0583	0.3
	April	0.000904	0.000904	0.000904	0.0114	0.0287	0.3
	May	0.000769	0.000769	0.000769	0.0131	0.0328	0.3
	June	0.000658	0.000658	0.000658	0.0106	0.0269	0.3
	July	0.000630	0.000630	0.000630	0.0156	0.0387	0.3
	August	0.000315	0.000315	0.000315	0.0161	0.0398	0.3
	September	0.000537	0.000537	0.000537	0.0214	0.0522	0.3
	October	0.000894	0.000894	0.000894	0.0214	0.0522	0.3
	November	0.000835	0.000835	0.000835	0.0256	0.0621	0.3
	December	0.000512	0.000512	0.000512	0.0253	0.0614	0.3

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G5j. M19A Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean	Maximum Predicted vs. BC Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.0269	0.0110	0.00180
	February	0.0112	0.00459	0.000833
	March	0.0177	0.00729	0.00142
	April	0.0766	0.0303	0.00290
	May	0.0560	0.0224	0.00245
	June	0.0561	0.0221	0.00198
	July	0.0353	0.0142	0.00183
	August	0.0155	0.00628	0.000833
	September	0.0117	0.00479	0.000833
	October	0.0314	0.0128	0.00223
	November	0.0239	0.00983	0.00203
	December	0.0099	0.00407	0.000833
Operations (2018-2042)	January	0.0329	0.0156	0.00220
	February	0.0159	0.00822	0.00118
	March	0.0214	0.0101	0.00171
	April	0.0773	0.0309	0.00293
	May	0.0567	0.0229	0.00248
	June	0.0577	0.0233	0.00204
	July	0.0366	0.0152	0.00190
	August	0.0166	0.00709	0.000891
	September	0.0165	0.00841	0.00118
	October	0.0341	0.0149	0.00243
	November	0.0264	0.0117	0.00225
	December	0.0130	0.00642	0.00110
Closure (2043-2060)	January	0.0460	0.0207	0.00307
	February	0.0303	0.0129	0.00225
	March	0.0336	0.0139	0.00268
	April	0.0796	0.0315	0.00301
	May	0.0586	0.0234	0.00256
	June	0.0621	0.0245	0.00219
	July	0.0404	0.0163	0.00210
	August	0.0196	0.00791	0.00105
	September	0.0251	0.0103	0.00179
	October	0.0419	0.0171	0.00298
	November	0.0327	0.0135	0.00278
	December	0.0203	0.00834	0.00171

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G5k. M19A Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Predicted Water Quality					
		Dissolved Iron Concentration			Total Iron Concentration		
		Median	Mean	Maximum	Median	Mean	Maximum
Construction (2015-2017)	January	0.0150	0.0150	0.0150	0.254	0.254	0.254
	February	0.0150	0.0150	0.0150	0.114	0.114	0.114
	March	0.0150	0.0150	0.0150	0.0315	0.0315	0.0315
	April	0.0390	0.0390	0.0390	0.398	0.398	0.398
	May	0.0150	0.0150	0.0150	0.248	0.248	0.248
	June	0.0150	0.0150	0.0150	0.0670	0.0670	0.0670
	July	0.0150	0.0150	0.0150	0.0350	0.0350	0.0350
	August	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
	September	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
	October	0.0150	0.0150	0.0150	0.0400	0.0400	0.0400
	November	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
	December	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
Operations (2018-2042)	January	0.0169	0.0171	0.0191	0.256	0.256	0.258
	February	0.0167	0.0168	0.0186	0.116	0.116	0.117
	March	0.0164	0.0165	0.0180	0.0329	0.0330	0.0345
	April	0.0391	0.0391	0.0393	0.398	0.398	0.398
	May	0.0151	0.0152	0.0153	0.248	0.248	0.248
	June	0.0153	0.0153	0.0156	0.0672	0.0673	0.0675
	July	0.0153	0.0154	0.0157	0.0353	0.0354	0.0357
	August	0.0153	0.0153	0.0156	0.0153	0.0153	0.0156
	September	0.0166	0.0168	0.0183	0.0166	0.0168	0.0183
	October	0.0159	0.0160	0.0169	0.0409	0.0410	0.0419
	November	0.0160	0.0161	0.0170	0.0160	0.0161	0.0170
	December	0.0162	0.0164	0.0175	0.0162	0.0164	0.0175
Closure (2043-2060)	January	0.0357	0.0354	0.0357	0.274	0.274	0.274
	February	0.0384	0.0383	0.0384	0.137	0.137	0.137
	March	0.0359	0.0359	0.0359	0.0524	0.0524	0.0524
	April	0.0409	0.0409	0.0409	0.399	0.399	0.399
	May	0.0169	0.0169	0.0169	0.249	0.249	0.249
	June	0.0185	0.0185	0.0185	0.0704	0.0704	0.0704
	July	0.0194	0.0194	0.0194	0.0394	0.0394	0.0394
	August	0.0186	0.0186	0.0186	0.0186	0.0186	0.0186
	September	0.0308	0.0308	0.0308	0.0308	0.0308	0.0308
	October	0.0274	0.0274	0.0274	0.0523	0.0523	0.0523
	November	0.0274	0.0274	0.0274	0.0274	0.0274	0.0274
	December	0.0294	0.0294	0.0294	0.0294	0.0294	0.0294

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5k. M19A Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Aquatic Life Guideline		Hazard Quotient relative to Aquatic Life Guideline	
		BC MOE Maximum Guideline for Dissolved Iron	BC MOE Maximum Guideline for Total Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Dissolved Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Total Iron
Construction (2015-2017)	January	0.35	1	0.0429	0.254
	February	0.35	1	0.0429	0.114
	March	0.35	1	0.0429	0.0315
	April	0.35	1	0.111	0.398
	May	0.35	1	0.0429	0.248
	June	0.35	1	0.0429	0.0670
	July	0.35	1	0.0429	0.0350
	August	0.35	1	0.0429	0.0150
	September	0.35	1	0.0429	0.0150
	October	0.35	1	0.0429	0.0400
	November	0.35	1	0.0429	0.0150
	December	0.35	1	0.0429	0.0150
Operations (2018-2042)	January	0.35	1	0.0546	0.258
	February	0.35	1	0.0531	0.117
	March	0.35	1	0.0514	0.0345
	April	0.35	1	0.112	0.398
	May	0.35	1	0.0437	0.248
	June	0.35	1	0.0444	0.0675
	July	0.35	1	0.0449	0.0357
	August	0.35	1	0.0445	0.0156
	September	0.35	1	0.0524	0.0183
	October	0.35	1	0.0483	0.0419
	November	0.35	1	0.0487	0.0170
	December	0.35	1	0.0500	0.0175
Closure (2043-2060)	January	0.35	1	0.102	0.274
	February	0.35	1	0.110	0.137
	March	0.35	1	0.103	0.0524
	April	0.35	1	0.117	0.399
	May	0.35	1	0.0483	0.249
	June	0.35	1	0.0529	0.0704
	July	0.35	1	0.0555	0.0394
	August	0.35	1	0.0530	0.0186
	September	0.35	1	0.0880	0.0308
	October	0.35	1	0.0782	0.0523
	November	0.35	1	0.0784	0.0274
	December	0.35	1	0.0841	0.0294

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5L. M19A Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline [†]		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	BC MOE 30-Day Mean
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000241	0.000241	0.000241	0.0281	0.426	0.05	0.1
	February	0.0000790	0.0000790	0.0000790	0.0317	0.489	0.05	0.1
	March	0.0000250	0.0000250	0.0000250	0.0344	0.535	0.05	0.1
	April	0.000215	0.000215	0.000215	0.0153	0.207	0.05	0.1
	May	0.000127	0.000127	0.000127	0.0178	0.249	0.05	0.1
	June	0.0000390	0.0000390	0.0000390	0.0143	0.190	0.05	0.1
	July	0.0000250	0.0000250	0.0000250	0.0213	0.310	0.05	0.1
	August	0.0000250	0.0000250	0.0000250	0.0220	0.322	0.05	0.1
	September	0.0000250	0.0000250	0.0000250	0.0302	0.462	0.05	0.1
	October	0.0000250	0.0000250	0.0000250	0.0302	0.462	0.05	0.1
	November	0.0000250	0.0000250	0.0000250	0.0371	0.581	0.05	0.1
	December	0.0000250	0.0000250	0.0000250	0.0366	0.573	0.05	0.1
Operations (2018-2042)	January	0.000248	0.000248	0.000255	0.0281	0.426	0.05	0.1
	February	0.0000857	0.0000854	0.0000913	0.0317	0.489	0.05	0.1
	March	0.0000306	0.0000304	0.0000353	0.0344	0.535	0.05	0.1
	April	0.000215	0.000215	0.000216	0.0153	0.207	0.05	0.1
	May	0.000128	0.000127	0.000128	0.0178	0.249	0.05	0.1
	June	0.0000401	0.0000400	0.0000409	0.0143	0.190	0.05	0.1
	July	0.0000263	0.0000263	0.0000275	0.0213	0.310	0.05	0.1
	August	0.0000261	0.0000261	0.0000270	0.0220	0.322	0.05	0.1
	September	0.0000314	0.0000313	0.0000367	0.0302	0.462	0.05	0.1
	October	0.0000286	0.0000286	0.0000317	0.0302	0.462	0.05	0.1
	November	0.0000289	0.0000289	0.0000322	0.0371	0.581	0.05	0.1
	December	0.0000299	0.0000298	0.0000339	0.0366	0.573	0.05	0.1
Closure (2043-2060)	January	0.000275	0.000275	0.000277	0.0281	0.426	0.05	0.1
	February	0.000118	0.000118	0.000119	0.0317	0.489	0.05	0.1
	March	0.0000603	0.0000603	0.0000604	0.0344	0.535	0.05	0.1
	April	0.000218	0.000218	0.000218	0.0153	0.207	0.05	0.1
	May	0.000130	0.000130	0.000130	0.0178	0.249	0.05	0.1
	June	0.0000449	0.0000449	0.0000449	0.0143	0.190	0.05	0.1
	July	0.0000324	0.0000324	0.0000324	0.0213	0.310	0.05	0.1
	August	0.0000310	0.0000310	0.0000310	0.0220	0.322	0.05	0.1
	September	0.0000516	0.0000516	0.0000516	0.0302	0.462	0.05	0.1
	October	0.0000459	0.0000459	0.0000459	0.0302	0.462	0.05	0.1
	November	0.0000460	0.0000460	0.0000460	0.0371	0.581	0.05	0.1
	December	0.0000493	0.0000493	0.0000493	0.0366	0.573	0.05	0.1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

[†] Guidelines are hardness dependent

Appendix 8-G5I. M19A Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.00858	0.000565	0.00482	0.00241
	February	0.00249	0.000162	0.00158	0.000790
	March	0.000727	0.0000467	0.000500	0.000250
	April	0.0140	0.00104	0.00430	0.00215
	May	0.00715	0.000511	0.00254	0.00127
	June	0.00272	0.000206	0.000780	0.000390
	July	0.00117	0.0000807	0.000500	0.000250
	August	0.00113	0.0000776	0.000500	0.000250
	September	0.000828	0.0000541	0.000500	0.000250
	October	0.000828	0.0000541	0.000500	0.000250
	November	0.000674	0.0000430	0.000500	0.000250
	December	0.000683	0.0000436	0.000500	0.000250
Operations (2018-2042)	January	0.00884	0.000598	0.00510	0.00248
	February	0.00269	0.000187	0.00183	0.000854
	March	0.000883	0.0000660	0.000706	0.000304
	April	0.0140	0.00104	0.004316	0.00215
	May	0.00718	0.000515	0.00256	0.00127
	June	0.00279	0.000216	0.000818	0.000400
	July	0.00123	0.0000886	0.000549	0.000263
	August	0.00118	0.0000838	0.000540	0.000261
	September	0.00104	0.0000794	0.000734	0.000313
	October	0.000947	0.0000685	0.000633	0.000286
	November	0.000779	0.0000554	0.000644	0.000289
	December	0.00081	0.0000591	0.000678	0.000298
Closure (2043-2060)	January	0.00980	0.000649	0.00554	0.00275
	February	0.00373	0.000243	0.00238	0.00118
	March	0.00175	0.000113	0.00121	0.000603
	April	0.0142	0.00105	0.00436	0.00218
	May	0.00732	0.000523	0.00260	0.00130
	June	0.00314	0.000237	0.000898	0.000449
	July	0.00152	0.000105	0.000649	0.000324
	August	0.00141	0.0000962	0.000620	0.000310
	September	0.00171	0.000112	0.00103	0.000516
	October	0.00152	0.0000992	0.000917	0.000459
	November	0.00124	0.0000791	0.000920	0.000460
	December	0.00135	0.0000861	0.000987	0.000493

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G5m. M19A Creek Hazard Quotients for Total Lithium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Lithium Concentration			BC MOE Working Final Chronic Value Guideline	BC MOE Working Maximum Guideline	Maximum Predicted vs. BC MOE Working Final Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0103	0.0103	0.0103	0.096	0.87	0.107	0.0118
	February	0.00995	0.00995	0.0100	0.096	0.87	0.104	0.0114
	March	0.0117	0.0117	0.0117	0.096	0.87	0.122	0.0135
	April	0.00708	0.00708	0.00708	0.096	0.87	0.0738	0.00814
	May	0.00703	0.00703	0.00703	0.096	0.87	0.0732	0.00808
	June	0.00632	0.00632	0.00632	0.096	0.87	0.0658	0.00726
	July	0.00919	0.00919	0.00919	0.096	0.87	0.0957	0.0106
	August	0.00867	0.00867	0.00867	0.096	0.87	0.0903	0.00997
	September	0.0104	0.0104	0.0104	0.096	0.87	0.108	0.0120
	October	0.0109	0.0109	0.0109	0.096	0.87	0.114	0.0125
	November	0.0105	0.0105	0.0105	0.096	0.87	0.109	0.0121
	December	0.0107	0.0107	0.0107	0.096	0.87	0.111	0.0123
Operations (2018-2042)	January	0.0112	0.0112	0.0120	0.096	0.87	0.126	0.0138
	February	0.0108	0.0107	0.0115	0.096	0.87	0.120	0.0132
	March	0.0124	0.0124	0.0130	0.096	0.87	0.136	0.0150
	April	0.00715	0.00714	0.00721	0.096	0.87	0.0751	0.00828
	May	0.00710	0.00710	0.00716	0.096	0.87	0.0746	0.00823
	June	0.00645	0.00644	0.00656	0.096	0.87	0.0683	0.00754
	July	0.00935	0.00935	0.00949	0.096	0.87	0.0989	0.0109
	August	0.00880	0.00880	0.00892	0.096	0.87	0.0929	0.0102
	September	0.0112	0.0112	0.0119	0.096	0.87	0.124	0.0136
	October	0.0113	0.0113	0.0117	0.096	0.87	0.122	0.0135
	November	0.0110	0.0110	0.0114	0.096	0.87	0.119	0.0131
	December	0.0113	0.0113	0.0118	0.096	0.87	0.123	0.0136
Closure (2043-2060)	January	0.0139	0.0140	0.0144	0.096	0.87	0.151	0.0166
	February	0.0141	0.0141	0.0142	0.096	0.87	0.148	0.0163
	March	0.0155	0.0155	0.0155	0.096	0.87	0.161	0.0178
	April	0.00742	0.00742	0.00742	0.096	0.87	0.0773	0.00853
	May	0.00736	0.00736	0.00736	0.096	0.87	0.0767	0.00846
	June	0.00694	0.00694	0.00694	0.096	0.87	0.0723	0.00798
	July	0.0100	0.0100	0.0100	0.096	0.87	0.104	0.0115
	August	0.00929	0.00929	0.00929	0.096	0.87	0.0968	0.0107
	September	0.0132	0.0132	0.0132	0.096	0.87	0.137	0.0151
	October	0.0131	0.0131	0.0131	0.096	0.87	0.136	0.0150
	November	0.0127	0.0127	0.0127	0.096	0.87	0.132	0.0146
	December	0.0132	0.0132	0.0132	0.096	0.87	0.138	0.0152

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5n. M19A Creek Hazard Quotients for Total Manganese, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Manganese Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0189	0.0189	0.0189	2.81	6.06	0.00673	0.00312
	February	0.00561	0.00561	0.00561	3.06	6.69	0.00183	0.000839
	March	0.00356	0.00356	0.00357	3.24	7.14	0.00110	0.000499
	April	0.0247	0.0247	0.0247	1.85	3.67	0.0133	0.00673
	May	0.0111	0.0111	0.0111	2.05	4.15	0.00544	0.00268
	June	0.00414	0.00414	0.00414	1.77	3.46	0.00234	0.00120
	July	0.00260	0.00260	0.00260	2.32	4.84	0.00112	0.000537
	August	0.00187	0.00187	0.00187	2.37	4.97	0.000788	0.000376
	September	0.00114	0.00114	0.00114	2.95	6.42	0.000386	0.000177
	October	0.00272	0.00272	0.00272	2.95	6.42	0.000921	0.000423
	November	0.00118	0.00118	0.00118	3.42	7.58	0.000345	0.000156
	December	0.00156	0.00156	0.00156	3.39	7.50	0.000461	0.000208
Operations (2018-2042)	January	0.0190	0.0190	0.0192	2.81	6.06	0.00678	0.00316
	February	0.00573	0.00575	0.00586	3.06	6.69	0.00188	0.000876
	March	0.00367	0.00368	0.00378	3.24	7.14	0.00114	0.000529
	April	0.0247	0.0247	0.0247	1.85	3.67	0.0133	0.00673
	May	0.0112	0.0112	0.0112	2.05	4.15	0.00544	0.00269
	June	0.00416	0.00416	0.00418	1.77	3.46	0.00235	0.00121
	July	0.00262	0.00263	0.00265	2.32	4.84	0.00113	0.000547
	August	0.00189	0.00189	0.00191	2.37	4.97	0.000797	0.000384
	September	0.00126	0.00127	0.00138	2.95	6.42	0.000431	0.000215
	October	0.00279	0.00279	0.00285	2.95	6.42	0.000946	0.000444
	November	0.00125	0.00126	0.00133	3.42	7.58	0.000369	0.000175
	December	0.00165	0.00166	0.00174	3.39	7.50	0.000491	0.000232
Closure (2043-2060)	January	0.0197	0.0197	0.0197	2.81	6.06	0.00702	0.00325
	February	0.00660	0.00660	0.00660	3.06	6.69	0.00216	0.000986
	March	0.00444	0.00444	0.00444	3.24	7.14	0.00137	0.000622
	April	0.0247	0.0247	0.0247	1.85	3.67	0.0133	0.00674
	May	0.0112	0.0112	0.0112	2.05	4.15	0.00547	0.00270
	June	0.00428	0.00428	0.00428	1.77	3.46	0.00242	0.00124
	July	0.00278	0.00278	0.00278	2.32	4.84	0.00120	0.000575
	August	0.00202	0.00202	0.00202	2.37	4.97	0.000850	0.000406
	September	0.00181	0.00181	0.00181	2.95	6.42	0.000611	0.000281
	October	0.00324	0.00324	0.00324	2.95	6.42	0.00110	0.000504
	November	0.00170	0.00170	0.00170	3.42	7.58	0.000499	0.000225
	December	0.00217	0.00217	0.00217	3.39	7.50	0.000640	0.000289

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

¹ Guidelines are hardness dependent

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5o. M19A Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	Drinking Water Quality Guidelines BC DWQG	BC MOE Working Water Quality Guidelines for Wildlife Water Supply BC MOE 30-Day Mean if MeHg is 0.5% of THg
		Total Mercury Concentration					
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	February	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	March	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	May	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	June	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	July	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	October	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	November	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	December	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
Operations (2018-2042)	January	0.0000611	0.0000603	0.0000695	0.00002	0.001	0.00002
	February	0.0000599	0.0000591	0.0000670	0.00002	0.001	0.00002
	March	0.0000583	0.0000576	0.0000641	0.00002	0.001	0.00002
	April	0.0000508	0.0000507	0.0000514	0.00002	0.001	0.00002
	May	0.0000509	0.0000508	0.0000514	0.00002	0.001	0.00002
	June	0.0000516	0.0000514	0.0000526	0.00002	0.001	0.00002
	July	0.0000520	0.0000518	0.0000533	0.00002	0.001	0.00002
	August	0.0000516	0.0000514	0.0000526	0.00002	0.001	0.00002
	September	0.0000597	0.0000586	0.0000655	0.00002	0.001	0.00002
	October	0.0000556	0.0000549	0.0000587	0.00002	0.001	0.00002
	November	0.0000560	0.0000553	0.0000594	0.00002	0.001	0.00002
	December	0.0000575	0.0000565	0.0000615	0.00002	0.001	0.00002
Closure (2043-2060)	January	0.0000893	0.0000893	0.0000895	0.00002	0.001	0.00002
	February	0.0000944	0.0000944	0.0000944	0.00002	0.001	0.00002
	March	0.0000896	0.0000896	0.0000897	0.00002	0.001	0.00002
	April	0.0000536	0.0000536	0.0000536	0.00002	0.001	0.00002
	May	0.0000536	0.0000536	0.0000536	0.00002	0.001	0.00002
	June	0.0000566	0.0000566	0.0000566	0.00002	0.001	0.00002
	July	0.0000583	0.0000583	0.0000583	0.00002	0.001	0.00002
	August	0.0000567	0.0000567	0.0000567	0.00002	0.001	0.00002
	September	0.0000800	0.0000800	0.0000800	0.00002	0.001	0.00002
	October	0.0000734	0.0000734	0.0000734	0.00002	0.001	0.00002
	November	0.0000736	0.0000736	0.0000736	0.00002	0.001	0.00002
	December	0.0000774	0.0000774	0.0000774	0.00002	0.001	0.00002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5o. M19A Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg
Construction (2015-2017)	January	0.250	0.00500	0.250
	February	0.250	0.00500	0.250
	March	0.250	0.00500	0.250
	April	0.250	0.00500	0.250
	May	0.250	0.00500	0.250
	June	0.250	0.00500	0.250
	July	0.250	0.00500	0.250
	August	0.250	0.00500	0.250
	September	0.250	0.00500	0.250
	October	0.250	0.00500	0.250
	November	0.250	0.00500	0.250
	December	0.250	0.00500	0.250
Operations (2018-2042)	January	0.302	0.00695	0.302
	February	0.295	0.00670	0.295
	March	0.288	0.00641	0.288
	April	0.254	0.00514	0.254
	May	0.254	0.00514	0.254
	June	0.257	0.00526	0.257
	July	0.259	0.00533	0.259
	August	0.257	0.00526	0.257
	September	0.293	0.00655	0.293
	October	0.274	0.00587	0.274
	November	0.276	0.00594	0.276
	December	0.283	0.00615	0.283
Closure (2043-2060)	January	0.446	0.00895	0.446
	February	0.472	0.00944	0.472
	March	0.448	0.00897	0.448
	April	0.268	0.00536	0.268
	May	0.268	0.00536	0.268
	June	0.283	0.00566	0.283
	July	0.292	0.00583	0.292
	August	0.284	0.00567	0.284
	September	0.400	0.00800	0.400
	October	0.367	0.00734	0.367
	November	0.368	0.00736	0.368
	December	0.387	0.00774	0.387

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5p. M19A Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000298	0.000298	0.000298	1	2	0.25	0.05
	February	0.000363	0.000363	0.000363	1	2	0.25	0.05
	March	0.000346	0.000346	0.000347	1	2	0.25	0.05
	April	0.000295	0.000295	0.000295	1	2	0.25	0.05
	May	0.000273	0.000273	0.000274	1	2	0.25	0.05
	June	0.000258	0.000258	0.000258	1	2	0.25	0.05
	July	0.000251	0.000251	0.000251	1	2	0.25	0.05
	August	0.000302	0.000302	0.000302	1	2	0.25	0.05
	September	0.000357	0.000357	0.000357	1	2	0.25	0.05
	October	0.000301	0.000301	0.000301	1	2	0.25	0.05
	November	0.000301	0.000301	0.000301	1	2	0.25	0.05
	December	0.000314	0.000314	0.000314	1	2	0.25	0.05
Operations (2018-2042)	January	0.000812	0.000813	0.00134	1	2	0.25	0.05
	February	0.000817	0.000818	0.00128	1	2	0.25	0.05
	March	0.000727	0.000729	0.00111	1	2	0.25	0.05
	April	0.000334	0.000334	0.000373	1	2	0.25	0.05
	May	0.000313	0.000313	0.000353	1	2	0.25	0.05
	June	0.000331	0.000332	0.000405	1	2	0.25	0.05
	July	0.000343	0.000345	0.000435	1	2	0.25	0.05
	August	0.000377	0.000378	0.000451	1	2	0.25	0.05
	September	0.000797	0.000805	0.00123	1	2	0.25	0.05
	October	0.000552	0.000558	0.000800	1	2	0.25	0.05
	November	0.000573	0.000580	0.000841	1	2	0.25	0.05
	December	0.000651	0.000660	0.000982	1	2	0.25	0.05
Closure (2043-2060)	January	0.00146	0.00150	0.00214	1	2	0.25	0.05
	February	0.00168	0.00169	0.00184	1	2	0.25	0.05
	March	0.00152	0.00153	0.00156	1	2	0.25	0.05
	April	0.000406	0.000406	0.000406	1	2	0.25	0.05
	May	0.000382	0.000382	0.000382	1	2	0.25	0.05
	June	0.000458	0.000458	0.000458	1	2	0.25	0.05
	July	0.000500	0.000500	0.000500	1	2	0.25	0.05
	August	0.000503	0.000503	0.000503	1	2	0.25	0.05
	September	0.00124	0.00124	0.00124	1	2	0.25	0.05
	October	0.00100	0.00100	0.00100	1	2	0.25	0.05
	November	0.00100	0.00100	0.00100	1	2	0.25	0.05
	December	0.00113	0.00113	0.00113	1	2	0.25	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5p. M19A Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.000298	0.000149	0.00119	0.00596
	February	0.000363	0.000181	0.00145	0.00726
	March	0.000346	0.000173	0.00139	0.00693
	April	0.000295	0.000148	0.00118	0.00590
	May	0.000273	0.000137	0.00109	0.00547
	June	0.000258	0.000129	0.00103	0.00517
	July	0.000251	0.000125	0.00100	0.00502
	August	0.000302	0.000151	0.00121	0.00604
	September	0.000357	0.000179	0.00143	0.00714
	October	0.000301	0.000150	0.00120	0.00602
	November	0.000301	0.000150	0.00120	0.00602
	December	0.000314	0.000157	0.00126	0.00628
Operations (2018-2042)	January	0.000813	0.000669	0.00535	0.0267
	February	0.000818	0.000639	0.00511	0.0256
	March	0.000729	0.000557	0.00445	0.0223
	April	0.000334	0.000187	0.00149	0.00746
	May	0.000313	0.000176	0.00141	0.00706
	June	0.000332	0.000202	0.00162	0.00809
	July	0.000345	0.000218	0.00174	0.00871
	August	0.000378	0.000226	0.00181	0.00903
	September	0.000805	0.000616	0.00493	0.0246
	October	0.000558	0.000400	0.00320	0.0160
	November	0.000580	0.000421	0.00337	0.0168
	December	0.000660	0.000491	0.00393	0.0196
Closure (2043-2060)	January	0.00150	0.00107	0.00858	0.0429
	February	0.00169	0.000922	0.00738	0.0369
	March	0.00153	0.000782	0.00625	0.0313
	April	0.000406	0.000203	0.00162	0.00811
	May	0.000382	0.000191	0.00153	0.00765
	June	0.000458	0.000229	0.00183	0.00915
	July	0.000500	0.000250	0.00200	0.0100
	August	0.000503	0.000252	0.00201	0.0101
	September	0.00124	0.000619	0.00496	0.0248
	October	0.00100	0.000499	0.00399	0.0200
	November	0.00100	0.000501	0.00401	0.0200
	December	0.00113	0.000563	0.00450	0.0225

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5q. M19A Creek Hazard Quotients for Total Nickel, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Hazard Quotient relative to Aquatic Life Guideline
		Total Nickel Concentration			BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.00141	0.00141	0.00141	0.15	0.00940
	February	0.00174	0.00174	0.00174	0.15	0.0116
	March	0.00130	0.00130	0.00131	0.15	0.00870
	April	0.00119	0.00119	0.00119	0.15	0.00793
	May	0.00106	0.00106	0.00106	0.15	0.00707
	June	0.000870	0.000870	0.000870	0.15	0.00580
	July	0.000900	0.000900	0.000900	0.15	0.00600
	August	0.00112	0.00112	0.00112	0.15	0.00747
	September	0.00158	0.00158	0.00158	0.15	0.0105
	October	0.00122	0.00122	0.00122	0.15	0.00813
	November	0.00159	0.00159	0.00159	0.15	0.0106
	December	0.00172	0.00172	0.00172	0.15	0.0115
Operations (2018-2042)	January	0.00164	0.00164	0.00186	0.15	0.0124
	February	0.00195	0.00194	0.00214	0.15	0.0143
	March	0.00148	0.00148	0.00164	0.15	0.0109
	April	0.00121	0.00121	0.00122	0.15	0.00815
	May	0.00108	0.00108	0.00109	0.15	0.00729
	June	0.000903	0.000903	0.000933	0.15	0.00622
	July	0.000942	0.000941	0.000980	0.15	0.00653
	August	0.00115	0.00115	0.00118	0.15	0.00789
	September	0.00178	0.00178	0.00196	0.15	0.0131
	October	0.00133	0.00133	0.00144	0.15	0.00958
	November	0.00171	0.00171	0.00182	0.15	0.0122
	December	0.00187	0.00187	0.00201	0.15	0.0134
Closure (2043-2060)	January	0.00203	0.00205	0.00228	0.15	0.0152
	February	0.00244	0.00245	0.00250	0.15	0.0167
	March	0.00193	0.00194	0.00195	0.15	0.0130
	April	0.00125	0.00125	0.00125	0.15	0.00831
	May	0.00112	0.00112	0.00112	0.15	0.00744
	June	0.00098	0.00098	0.00098	0.15	0.00650
	July	0.00103	0.00103	0.00103	0.15	0.00688
	August	0.00123	0.00123	0.00123	0.15	0.00817
	September	0.00205	0.00205	0.00205	0.15	0.0137
	October	0.00159	0.00159	0.00159	0.15	0.0106
	November	0.00196	0.00196	0.00196	0.15	0.0131
	December	0.00215	0.00215	0.00215	0.15	0.0144

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guideline is hardness dependent

Appendix 8-G5r. M19A Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Selenium Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000370	0.000370	0.000370	0.002	0.01	0.002	0.185
	February	0.000880	0.000880	0.000880	0.002	0.01	0.002	0.440
	March	0.000560	0.000560	0.000560	0.002	0.01	0.002	0.280
	April	0.000440	0.000440	0.000440	0.002	0.01	0.002	0.220
	May	0.000345	0.000345	0.000345	0.002	0.01	0.002	0.172
	June	0.000400	0.000400	0.000400	0.002	0.01	0.002	0.200
	July	0.000470	0.000470	0.000470	0.002	0.01	0.002	0.235
	August	0.000410	0.000410	0.000410	0.002	0.01	0.002	0.205
	September	0.000550	0.000550	0.000550	0.002	0.01	0.002	0.275
	October	0.000400	0.000400	0.000400	0.002	0.01	0.002	0.200
	November	0.000490	0.000490	0.000490	0.002	0.01	0.002	0.245
	December	0.000550	0.000550	0.000550	0.002	0.01	0.002	0.275
Operations (2018-2042)	January	0.00083	0.00082	0.00124	0.002	0.01	0.002	0.411
	February	0.00129	0.00128	0.00165	0.002	0.01	0.002	0.639
	March	0.00090	0.00090	0.00120	0.002	0.01	0.002	0.448
	April	0.000475	0.000474	0.000505	0.002	0.01	0.002	0.237
	May	0.000381	0.000380	0.000411	0.002	0.01	0.002	0.190
	June	0.000467	0.000464	0.000521	0.002	0.01	0.002	0.232
	July	0.000555	0.000552	0.000623	0.002	0.01	0.002	0.276
	August	0.000479	0.000476	0.000534	0.002	0.01	0.002	0.238
	September	0.00096	0.000941	0.00128	0.002	0.01	0.002	0.471
	October	0.000635	0.000624	0.000814	0.002	0.01	0.002	0.312
	November	0.000744	0.000733	0.000937	0.002	0.01	0.002	0.367
	December	0.00086	0.00085	0.00110	0.002	0.01	0.002	0.426
Closure (2043-2060)	January	0.00215	0.00217	0.00242	0.002	0.01	0.002	1.08
	February	0.00290	0.00290	0.00296	0.002	0.01	0.002	1.45
	March	0.00237	0.00237	0.00239	0.002	0.01	0.002	1.19
	April	0.000610	0.000610	0.000610	0.002	0.01	0.002	0.305
	May	0.000513	0.000513	0.000513	0.002	0.01	0.002	0.256
	June	0.000706	0.000706	0.000706	0.002	0.01	0.002	0.353
	July	0.000854	0.000854	0.000854	0.002	0.01	0.002	0.427
	August	0.000719	0.000719	0.000719	0.002	0.01	0.002	0.360
	September	0.00191	0.00191	0.00191	0.002	0.01	0.002	0.954
	October	0.00147	0.00147	0.00147	0.002	0.01	0.002	0.737
	November	0.00157	0.00157	0.00157	0.002	0.01	0.002	0.784
	December	0.00180	0.00180	0.00180	0.002	0.01	0.002	0.899

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5r. M19A Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0370	0.185
	February	0.0880	0.440
	March	0.0560	0.280
	April	0.0440	0.220
	May	0.0345	0.172
	June	0.0400	0.200
	July	0.0470	0.235
	August	0.0410	0.205
	September	0.0550	0.275
	October	0.0400	0.200
	November	0.0490	0.245
	December	0.0550	0.275
Operations (2018-2042)	January	0.124	0.620
	February	0.165	0.823
	March	0.120	0.600
	April	0.0505	0.253
	May	0.0411	0.206
	June	0.0521	0.261
	July	0.0623	0.312
	August	0.0534	0.267
	September	0.128	0.638
	October	0.0814	0.407
	November	0.0937	0.469
	December	0.110	0.551
Closure (2043-2060)	January	0.242	1.21
	February	0.296	1.48
	March	0.239	1.19
	April	0.0610	0.305
	May	0.0513	0.256
	June	0.0706	0.353
	July	0.0854	0.427
	August	0.0719	0.360
	September	0.191	0.954
	October	0.147	0.737
	November	0.157	0.784
	December	0.180	0.899

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5s. M19A Creek Hazard Quotients for Total Silver, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Silver Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	February	0.0000100	0.0000100	0.0000100	0.0015	0.003	0.00667	0.00333
	March	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	April	0.0000150	0.0000150	0.0000150	0.0015	0.003	0.0100	0.00500
	May	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	June	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	July	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	August	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	September	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	October	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	November	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	December	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
Operations (2018-2042)	January	0.0000543	0.0000542	0.0000585	0.0015	0.003	0.00361	0.00195
	February	0.0000104	0.0000104	0.0000107	0.0015	0.003	0.00691	0.00358
	March	0.0000532	0.0000531	0.0000562	0.0015	0.003	0.00354	0.00187
	April	0.0000150	0.0000150	0.0000151	0.0015	0.003	0.0100	0.00502
	May	0.0000503	0.0000503	0.0000506	0.0015	0.003	0.00335	0.00169
	June	0.0000506	0.0000506	0.0000512	0.0015	0.003	0.00337	0.00171
	July	0.0000507	0.0000507	0.0000515	0.0015	0.003	0.00338	0.00172
	August	0.0000506	0.0000506	0.0000512	0.0015	0.003	0.00337	0.00171
	September	0.0000536	0.0000536	0.0000571	0.0015	0.003	0.00357	0.00190
	October	0.0000521	0.0000521	0.0000540	0.0015	0.003	0.00347	0.00180
	November	0.0000522	0.0000522	0.0000544	0.0015	0.003	0.00348	0.00181
	December	0.0000528	0.0000528	0.0000554	0.0015	0.003	0.00352	0.00185
Closure (2043-2060)	January	0.0000734	0.0000734	0.0000734	0.0015	0.003	0.00490	0.00245
	February	0.0000126	0.0000126	0.0000126	0.0015	0.003	0.00843	0.00421
	March	0.0000738	0.0000738	0.0000738	0.0015	0.003	0.00492	0.00246
	April	0.0000152	0.0000152	0.0000152	0.0015	0.003	0.0101	0.00507
	May	0.0000521	0.0000521	0.0000521	0.0015	0.003	0.00347	0.00174
	June	0.0000540	0.0000540	0.0000540	0.0015	0.003	0.00360	0.00180
	July	0.0000550	0.0000550	0.0000550	0.0015	0.003	0.00366	0.00183
	August	0.0000540	0.0000540	0.0000540	0.0015	0.003	0.00360	0.00180
	September	0.0000678	0.0000678	0.0000678	0.0015	0.003	0.00452	0.00226
	October	0.0000641	0.0000641	0.0000641	0.0015	0.003	0.00427	0.00214
	November	0.0000641	0.0000641	0.0000641	0.0015	0.003	0.00428	0.00214
	December	0.0000664	0.0000664	0.0000664	0.0015	0.003	0.00443	0.00221

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G5t. M19A Creek Hazard Quotients for Total Thallium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Thallium Concentration			BC MOE Working Guideline	BC DWQG	Mean Predicted vs. BC MOE Working 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	February	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	March	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	April	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	May	0.0000850	0.0000850	0.0000850	0.0003	0.002	0.0283	0.00425
	June	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	July	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	August	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	September	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	October	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	November	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	December	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
Operations (2018-2042)	January	0.0000553	0.0000548	0.0000588	0.0003	0.002	0.0183	0.00294
	February	0.0000546	0.0000543	0.0000578	0.0003	0.002	0.0181	0.00289
	March	0.0000539	0.0000536	0.0000565	0.0003	0.002	0.0179	0.00282
	April	0.0000504	0.0000503	0.0000506	0.0003	0.002	0.0168	0.00253
	May	0.0000853	0.0000853	0.0000856	0.0003	0.002	0.0284	0.00428
	June	0.0000507	0.0000507	0.0000512	0.0003	0.002	0.0169	0.00256
	July	0.0000509	0.0000508	0.0000515	0.0003	0.002	0.0169	0.00258
	August	0.0000507	0.0000507	0.0000512	0.0003	0.002	0.0169	0.00256
	September	0.0000544	0.0000541	0.0000573	0.0003	0.002	0.0180	0.00286
	October	0.0000525	0.0000523	0.0000541	0.0003	0.002	0.0174	0.00271
	November	0.0000527	0.0000525	0.0000545	0.0003	0.002	0.0175	0.00272
	December	0.0000533	0.0000532	0.0000555	0.0003	0.002	0.0177	0.00278
Closure (2043-2060)	January	0.0000813	0.0000812	0.0000813	0.0003	0.002	0.0271	0.00407
	February	0.0000855	0.0000854	0.0000855	0.0003	0.002	0.0285	0.00427
	March	0.0000818	0.0000817	0.0000818	0.0003	0.002	0.0272	0.00409
	April	0.0000529	0.0000529	0.0000529	0.0003	0.002	0.0176	0.00265
	May	0.0000878	0.0000878	0.0000878	0.0003	0.002	0.0293	0.00439
	June	0.0000553	0.0000553	0.0000553	0.0003	0.002	0.0184	0.00276
	July	0.0000567	0.0000567	0.0000567	0.0003	0.002	0.0189	0.00283
	August	0.0000554	0.0000554	0.0000554	0.0003	0.002	0.0185	0.00277
	September	0.0000739	0.0000739	0.0000739	0.0003	0.002	0.0246	0.00369
	October	0.0000688	0.0000688	0.0000688	0.0003	0.002	0.0229	0.00344
	November	0.0000689	0.0000689	0.0000689	0.0003	0.002	0.0230	0.00344
	December	0.0000719	0.0000719	0.0000719	0.0003	0.002	0.0240	0.00359

Notes:
 All concentrations in mg/L.
 Grey shading indicates a hazard quotient > 1.0
 BC MOE = British Columbia Ministry Of Environment
 DWQG = Drinking water quality guideline

Appendix 8-G5u. M19A Creek Hazard Quotients for Total Uranium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Uranium Concentration			BC MOE Working Guideline	Canadian DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. Canadian DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00125	0.00125	0.00125	0.3	0.02	0.00417	0.0625
	February	0.00174	0.00174	0.00174	0.3	0.02	0.00580	0.0870
	March	0.00181	0.00181	0.00181	0.3	0.02	0.00605	0.0907
	April	0.000632	0.000632	0.000632	0.3	0.02	0.00211	0.0316
	May	0.000656	0.000656	0.000656	0.3	0.02	0.00219	0.0328
	June	0.000533	0.000533	0.000533	0.3	0.02	0.00178	0.0266
	July	0.000746	0.000746	0.000746	0.3	0.02	0.00249	0.0373
	August	0.000799	0.000799	0.000799	0.3	0.02	0.00266	0.0400
	September	0.00144	0.00144	0.00144	0.3	0.02	0.00480	0.0720
	October	0.00122	0.00122	0.00122	0.3	0.02	0.00407	0.0610
	November	0.00162	0.00162	0.00162	0.3	0.02	0.00540	0.0810
	December	0.00176	0.00176	0.00176	0.3	0.02	0.00587	0.0880
Operations (2018-2042)	January	0.00130	0.00130	0.00135	0.3	0.02	0.00450	0.0676
	February	0.00179	0.00179	0.00183	0.3	0.02	0.00610	0.0914
	March	0.00186	0.00185	0.00189	0.3	0.02	0.00630	0.0944
	April	0.000636	0.000636	0.000639	0.3	0.02	0.00213	0.0320
	May	0.000660	0.000660	0.000664	0.3	0.02	0.00221	0.0332
	June	0.000541	0.000540	0.000547	0.3	0.02	0.00182	0.0273
	July	0.000756	0.000755	0.000763	0.3	0.02	0.00254	0.0382
	August	0.000807	0.000806	0.000813	0.3	0.02	0.00271	0.0407
	September	0.00149	0.00149	0.00152	0.3	0.02	0.00508	0.0762
	October	0.00125	0.00125	0.00127	0.3	0.02	0.00423	0.0634
	November	0.00165	0.00165	0.00167	0.3	0.02	0.00557	0.0836
	December	0.00180	0.00179	0.00182	0.3	0.02	0.00608	0.0912
Closure (2043-2060)	January	0.00138	0.00138	0.00144	0.3	0.02	0.00479	0.0718
	February	0.00188	0.00188	0.00190	0.3	0.02	0.00632	0.095
	March	0.00194	0.00194	0.00194	0.3	0.02	0.00648	0.097
	April	0.000643	0.000643	0.000643	0.3	0.02	0.00214	0.0321
	May	0.000667	0.000667	0.000667	0.3	0.02	0.00222	0.0334
	June	0.000554	0.000554	0.000554	0.3	0.02	0.00185	0.0277
	July	0.000772	0.000772	0.000772	0.3	0.02	0.00257	0.0386
	August	0.000820	0.000820	0.000820	0.3	0.02	0.00273	0.0410
	September	0.00153	0.00153	0.00153	0.3	0.02	0.00511	0.0767
	October	0.00129	0.00129	0.00129	0.3	0.02	0.00431	0.0647
	November	0.00169	0.00169	0.00169	0.3	0.02	0.00565	0.0847
	December	0.00185	0.00185	0.00185	0.3	0.02	0.00615	0.0923

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5v. M19A Creek Hazard Quotients for Total Vanadium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Vanadium Concentration			BC MOE Working Guideline	BC MOE Working Secondary Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Secondary Chronic Value Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	February	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	March	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	April	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	May	0.000800	0.000800	0.000800	0.006	0.02	0.1333	0.0400
	June	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	July	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	August	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	September	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	October	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	November	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	December	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
Operations (2018-2042)	January	0.000567	0.000563	0.000624	0.006	0.02	0.104	0.0312
	February	0.000559	0.000556	0.000609	0.006	0.02	0.101	0.0304
	March	0.000549	0.000547	0.000591	0.006	0.02	0.0985	0.0295
	April	0.000505	0.000505	0.000509	0.006	0.02	0.0848	0.0254
	May	0.000805	0.000804	0.000809	0.006	0.02	0.135	0.0404
	June	0.000509	0.000509	0.000517	0.006	0.02	0.0862	0.0258
	July	0.000512	0.000511	0.000521	0.006	0.02	0.0869	0.0261
	August	0.000509	0.000509	0.000517	0.006	0.02	0.0862	0.0259
	September	0.000556	0.000555	0.000603	0.006	0.02	0.100	0.0301
	October	0.000532	0.000531	0.000558	0.006	0.02	0.0931	0.0279
	November	0.000535	0.000534	0.000563	0.006	0.02	0.0939	0.0282
	December	0.000543	0.000542	0.000578	0.006	0.02	0.0963	0.0289
Closure (2043-2060)	January	0.000627	0.000632	0.000709	0.006	0.02	0.118	0.0355
	February	0.000644	0.000645	0.000664	0.006	0.02	0.111	0.0332
	March	0.000629	0.000629	0.000634	0.006	0.02	0.106	0.0317
	April	0.000511	0.000511	0.000511	0.006	0.02	0.0852	0.0256
	May	0.000810	0.000810	0.000810	0.006	0.02	0.135	0.0405
	June	0.000521	0.000521	0.000521	0.006	0.02	0.0868	0.0260
	July	0.000527	0.000527	0.000527	0.006	0.02	0.0878	0.0263
	August	0.000521	0.000521	0.000521	0.006	0.02	0.0869	0.0261
	September	0.000596	0.000596	0.000596	0.006	0.02	0.0994	0.0298
	October	0.000576	0.000576	0.000576	0.006	0.02	0.0960	0.0288
	November	0.000576	0.000576	0.000576	0.006	0.02	0.0961	0.0288
	December	0.000588	0.000588	0.000588	0.006	0.02	0.0981	0.0294

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5w. M19A Creek Hazard Quotients for Total Zinc, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Zinc Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00150	0.00150	0.00150	0.316	0.341	0.00475	0.00440
	February	0.00440	0.00440	0.00440	0.359	0.384	0.0123	0.0115
	March	0.00150	0.00150	0.00150	0.389	0.415	0.00385	0.00362
	April	0.00340	0.00340	0.00340	0.153	0.179	0.0222	0.0190
	May	0.00255	0.00255	0.00255	0.186	0.212	0.0137	0.0121
	June	0.00150	0.00150	0.00150	0.139	0.164	0.0108	0.00913
	July	0.00150	0.00150	0.00150	0.233	0.258	0.00645	0.00581
	August	0.00150	0.00150	0.00150	0.242	0.267	0.00621	0.00562
	September	0.00150	0.00150	0.00150	0.341	0.366	0.00440	0.00410
	October	0.00330	0.00330	0.00330	0.341	0.366	0.00969	0.00902
	November	0.00150	0.00150	0.00150	0.419	0.445	0.00358	0.00337
	December	0.00150	0.00150	0.00150	0.414	0.440	0.00362	0.00341
Operations (2018-2042)	January	0.00171	0.00174	0.00196	0.316	0.341	0.00552	0.00573
	February	0.00458	0.00461	0.00480	0.359	0.384	0.0129	0.0125
	March	0.00165	0.00168	0.00183	0.389	0.415	0.00432	0.00442
	April	0.00341	0.00342	0.00343	0.153	0.179	0.0223	0.0192
	May	0.00257	0.00257	0.00258	0.186	0.212	0.0138	0.0122
	June	0.00153	0.00153	0.00156	0.139	0.164	0.0111	0.00951
	July	0.00154	0.00154	0.00158	0.233	0.258	0.00664	0.00611
	August	0.00153	0.00153	0.00156	0.242	0.267	0.00635	0.00585
	September	0.00168	0.00171	0.00187	0.341	0.366	0.00501	0.00511
	October	0.00340	0.00342	0.00351	0.341	0.366	0.0100	0.00959
	November	0.00161	0.00163	0.00173	0.419	0.445	0.00388	0.00388
	December	0.00164	0.00166	0.00178	0.414	0.440	0.00400	0.00405
Closure (2043-2060)	January	0.00347	0.00345	0.00347	0.316	0.341	0.0109	0.0102
	February	0.00661	0.00661	0.00661	0.359	0.384	0.0184	0.0172
	March	0.00349	0.00349	0.00349	0.389	0.415	0.00896	0.00841
	April	0.00358	0.00358	0.00358	0.153	0.179	0.0234	0.0201
	May	0.00273	0.00273	0.00273	0.186	0.212	0.0147	0.0129
	June	0.00183	0.00183	0.00183	0.139	0.164	0.0132	0.0112
	July	0.00192	0.00192	0.00192	0.233	0.258	0.00825	0.00744
	August	0.00184	0.00184	0.00184	0.242	0.267	0.00761	0.00688
	September	0.00300	0.00300	0.00300	0.341	0.366	0.00881	0.00820
	October	0.00447	0.00447	0.00447	0.341	0.366	0.0131	0.0122
	November	0.00268	0.00268	0.00268	0.419	0.445	0.00640	0.00603
	December	0.00287	0.00287	0.00287	0.414	0.440	0.00693	0.00653

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are hardness dependent

Appendix 8-G5x. M19A Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply Maximum
		Chloride Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	
		Median	Mean	Maximum			
Construction (2015-2017)	January	2.50	2.50	2.50	150	600	600
	February	2.50	2.50	2.50	150	600	600
	March	2.50	2.50	2.50	150	600	600
	April	3.40	3.40	3.40	150	600	600
	May	1.82	1.82	1.83	150	600	600
	June	2.17	2.17	2.17	150	600	600
	July	1.25	1.25	1.25	150	600	600
	August	2.50	2.50	2.50	150	600	600
	September	2.50	2.50	2.50	150	600	600
	October	2.50	2.50	2.50	150	600	600
	November	2.50	2.50	2.50	150	600	600
	December	2.50	2.50	2.50	150	600	600
Operations (2018-2042)	January	2.72	2.71	2.94	150	600	600
	February	2.69	2.69	2.89	150	600	600
	March	2.66	2.66	2.83	150	600	600
	April	3.42	3.41	3.43	150	600	600
	May	1.84	1.84	1.86	150	600	600
	June	2.20	2.20	2.23	150	600	600
	July	1.29	1.29	1.33	150	600	600
	August	2.53	2.53	2.56	150	600	600
	September	2.68	2.69	2.87	150	600	600
	October	2.61	2.61	2.71	150	600	600
	November	2.61	2.62	2.73	150	600	600
	December	2.64	2.64	2.78	150	600	600
Closure (2043-2060)	January	3.04	3.06	3.29	150	600	600
	February	3.12	3.12	3.18	150	600	600
	March	3.05	3.05	3.07	150	600	600
	April	3.45	3.45	3.45	150	600	600
	May	1.87	1.87	1.87	150	600	600
	June	2.26	2.26	2.26	150	600	600
	July	1.37	1.37	1.37	150	600	600
	August	2.59	2.59	2.59	150	600	600
	September	2.91	2.91	2.91	150	600	600
	October	2.83	2.83	2.83	150	600	600
	November	2.83	2.83	2.83	150	600	600
	December	2.88	2.88	2.88	150	600	600

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5x. M19A Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0167	0.00417	0.00417
	February	0.0167	0.00417	0.00417
	March	0.0167	0.00417	0.00417
	April	0.0227	0.00567	0.00567
	May	0.0122	0.00304	0.00304
	June	0.0145	0.00362	0.00362
	July	0.00833	0.00208	0.00208
	August	0.0167	0.00417	0.00417
	September	0.0167	0.00417	0.00417
	October	0.0167	0.00417	0.00417
	November	0.0167	0.00417	0.00417
	December	0.0167	0.00417	0.00417
Operations (2018-2042)	January	0.0181	0.00491	0.00491
	February	0.0179	0.00482	0.00482
	March	0.0177	0.00471	0.00471
	April	0.0228	0.00572	0.00572
	May	0.0123	0.00310	0.00310
	June	0.0147	0.00372	0.00372
	July	0.0086	0.00221	0.00221
	August	0.0169	0.00427	0.00427
	September	0.0179	0.00479	0.00479
	October	0.0174	0.00452	0.00452
	November	0.0174	0.00455	0.00455
	December	0.0176	0.00464	0.00464
Closure (2043-2060)	January	0.0204	0.00549	0.00549
	February	0.0208	0.00530	0.00530
	March	0.0204	0.00511	0.00511
	April	0.0230	0.00574	0.00574
	May	0.0125	0.00312	0.00312
	June	0.0151	0.00377	0.00377
	July	0.0091	0.00228	0.00228
	August	0.0173	0.00432	0.00432
	September	0.0194	0.00485	0.00485
	October	0.0188	0.00471	0.00471
	November	0.0188	0.00471	0.00471
	December	0.0192	0.00480	0.00480

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

Appendix 8-G5y. M19A Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Fluoride Concentration			BC MOE Maximum Guideline	BC Maximum DWQG	BC 30-Day Mean DWQG	30-Day Mean	Maximum
		Median	Mean	Maximum					
Construction (2015-2017)	January	0.100	0.100	0.100	1.98	1.5	1	1	1.5
	February	0.100	0.100	0.100	2.03	1.5	1	1	1.5
	March	0.100	0.100	0.100	2.05	1.5	1	1	1.5
	April	0.0840	0.0840	0.0840	1.75	1.5	1	1	1.5
	May	0.0895	0.0895	0.0895	1.81	1.5	1	1	1.5
	June	0.0955	0.0955	0.0955	1.73	1.5	1	1	1.5
	July	0.160	0.160	0.160	1.88	1.5	1	1	1.5
	August	0.300	0.300	0.300	1.89	1.5	1	1	1.5
	September	0.100	0.100	0.100	2.01	1.5	1	1	1.5
	October	0.100	0.100	0.100	2.01	1.5	1	1	1.5
	November	0.100	0.100	0.100	2.08	1.5	1	1	1.5
	December	0.100	0.100	0.100	2.08	1.5	1	1	1.5
Operations (2018-2042)	January	0.113	0.112	0.124	1.98	1.5	1	1	1.5
	February	0.111	0.111	0.121	2.03	1.5	1	1	1.5
	March	0.109	0.109	0.117	2.05	1.5	1	1	1.5
	April	0.0849	0.0849	0.0857	1.75	1.5	1	1	1.5
	May	0.0904	0.0904	0.0912	1.81	1.5	1	1	1.5
	June	0.0973	0.0972	0.0988	1.73	1.5	1	1	1.5
	July	0.162	0.162	0.164	1.88	1.5	1	1	1.5
	August	0.302	0.302	0.303	1.89	1.5	1	1	1.5
	September	0.111	0.111	0.120	2.01	1.5	1	1	1.5
	October	0.106	0.106	0.111	2.01	1.5	1	1	1.5
	November	0.107	0.107	0.112	2.08	1.5	1	1	1.5
	December	0.108	0.108	0.115	2.08	1.5	1	1	1.5
Closure (2043-2060)	January	0.134	0.134	0.146	1.98	1.5	1	1	1.5
	February	0.138	0.138	0.141	2.03	1.5	1	1	1.5
	March	0.134	0.134	0.135	2.05	1.5	1	1	1.5
	April	0.0871	0.0871	0.0871	1.75	1.5	1	1	1.5
	May	0.0925	0.0925	0.0925	1.81	1.5	1	1	1.5
	June	0.101	0.101	0.101	1.73	1.5	1	1	1.5
	July	0.167	0.167	0.167	1.88	1.5	1	1	1.5
	August	0.305	0.305	0.305	1.89	1.5	1	1	1.5
	September	0.126	0.126	0.126	2.01	1.5	1	1	1.5
	October	0.120	0.120	0.120	2.01	1.5	1	1	1.5
	November	0.120	0.120	0.120	2.08	1.5	1	1	1.5
	December	0.123	0.123	0.123	2.08	1.5	1	1	1.5

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G5y. M19A Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC Maximum DWQG	Maximum Predicted vs. BC 30-Day Mean DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0505	0.0667	0.100	0.100	0.0667
	February	0.0494	0.0667	0.100	0.100	0.0667
	March	0.0487	0.0667	0.100	0.100	0.0667
	April	0.0479	0.0560	0.100	0.0840	0.0560
	May	0.0494	0.0597	0.0840	0.0895	0.0597
	June	0.0553	0.0637	0.0895	0.0955	0.0637
	July	0.0850	0.107	0.0955	0.160	0.107
	August	0.158	0.200	0.1600	0.300	0.200
	September	0.0498	0.0667	0.300	0.100	0.0667
	October	0.0498	0.0667	0.100	0.100	0.0667
	November	0.0481	0.0667	0.100	0.100	0.0667
	December	0.0482	0.0667	0.100	0.100	0.0667
Operations (2018-2042)	January	0.0624	0.0825	0.112	0.112	0.0825
	February	0.0597	0.0806	0.112	0.111	0.0806
	March	0.0572	0.0783	0.111	0.109	0.0783
	April	0.0489	0.0572	0.109	0.0849	0.0572
	May	0.0504	0.0608	0.0849	0.0904	0.0608
	June	0.0572	0.0658	0.0904	0.0972	0.0658
	July	0.0872	0.109	0.0972	0.162	0.109
	August	0.160	0.202	0.162	0.302	0.202
	September	0.0597	0.0798	0.302	0.111	0.080
	October	0.0554	0.0742	0.111	0.106	0.0742
	November	0.0539	0.0748	0.106	0.107	0.0748
	December	0.0554	0.077	0.115	0.108	0.0767
Closure (2043-2060)	January	0.0737	0.0974	0.134	0.134	0.0974
	February	0.0697	0.0941	0.134	0.138	0.0941
	March	0.0657	0.0899	0.138	0.134	0.0899
	April	0.0496	0.0580	0.134	0.0871	0.0580
	May	0.0511	0.0617	0.0871	0.0925	0.0617
	June	0.0586	0.0674	0.0925	0.101	0.0674
	July	0.0888	0.111	0.101	0.167	0.111
	August	0.161	0.204	0.167	0.305	0.204
	September	0.0625	0.0837	0.305	0.126	0.0837
	October	0.0598	0.0801	0.126	0.120	0.0801
	November	0.0578	0.0802	0.120	0.120	0.0802
	December	0.0595	0.0823	0.123	0.123	0.0823

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ *Guideline is hardness dependent*

Appendix 8-G5z. M19A Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Nitrate Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0840	0.0840	0.0840	3	32.8	10
	February	0.114	0.114	0.114	3	32.8	10
	March	0.122	0.122	0.122	3	32.8	10
	April	0.0355	0.0355	0.0355	3	32.8	10
	May	0.00250	0.00250	0.00250	3	32.8	10
	June	0.00250	0.00250	0.00250	3	32.8	10
	July	0.0125	0.0125	0.0125	3	32.8	10
	August	0.0250	0.0250	0.0250	3	32.8	10
	September	0.0590	0.0590	0.0590	3	32.8	10
	October	0.0250	0.0250	0.0250	3	32.8	10
	November	0.135	0.135	0.135	3	32.8	10
	December	0.148	0.148	0.148	3	32.8	10
Operations (2018-2042)	January	0.0839	0.0840	0.0840	3	32.8	10
	February	0.114	0.114	0.114	3	32.8	10
	March	0.122	0.122	0.122	3	32.8	10
	April	0.0355	0.0355	0.0355	3	32.8	10
	May	0.00250	0.00250	0.00250	3	32.8	10
	June	0.00250	0.00250	0.00250	3	32.8	10
	July	0.0125	0.0125	0.0125	3	32.8	10
	August	0.0250	0.0250	0.0250	3	32.8	10
	September	0.0590	0.0590	0.0590	3	32.8	10
	October	0.0250	0.0250	0.0250	3	32.8	10
	November	0.135	0.135	0.135	3	32.8	10
	December	0.148	0.148	0.148	3	32.8	10
Closure (2043-2060)	January	0.0839	0.0839	0.0839	3	32.8	10
	February	0.114	0.114	0.114	3	32.8	10
	March	0.122	0.122	0.122	3	32.8	10
	April	0.0354	0.0354	0.0354	3	32.8	10
	May	0.00249	0.00249	0.00249	3	32.8	10
	June	0.00249	0.00249	0.00249	3	32.8	10
	July	0.0125	0.0125	0.0125	3	32.8	10
	August	0.0249	0.0249	0.0249	3	32.8	10
	September	0.0589	0.0589	0.0589	3	32.8	10
	October	0.0249	0.0249	0.0249	3	32.8	10
	November	0.135	0.135	0.135	3	32.8	10
	December	0.148	0.148	0.148	3	32.8	10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5z. M19A Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs BC MOE 30-Day Mean	Maximum Predicted vs BC MOE Maximum	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0280	0.00256	0.00840
	February	0.0380	0.00348	0.0114
	March	0.0408	0.00373	0.0122
	April	0.0118	0.00108	0.00355
	May	0.000833	0.0000762	0.000250
	June	0.000833	0.0000762	0.000250
	July	0.00417	0.000381	0.00125
	August	0.00833	0.000762	0.00250
	September	0.0197	0.00180	0.00590
	October	0.00833	0.000762	0.00250
	November	0.0450	0.00412	0.0135
	December	0.0493	0.00451	0.0148
Operations (2018-2042)	January	0.0280	0.00256	0.00840
	February	0.0380	0.00347	0.0114
	March	0.0408	0.00373	0.0122
	April	0.0118	0.00108	0.00355
	May	0.000833	0.0000762	0.000250
	June	0.000833	0.0000762	0.000250
	July	0.00416	0.000381	0.00125
	August	0.00833	0.000762	0.00250
	September	0.0197	0.00180	0.00590
	October	0.00833	0.000762	0.00250
	November	0.0450	0.00412	0.0135
	December	0.0493	0.00451	0.0148
Closure (2043-2060)	January	0.0280	0.00256	0.00839
	February	0.0379	0.00347	0.0114
	March	0.0407	0.00373	0.0122
	April	0.0118	0.00108	0.00354
	May	0.000832	0.0000761	0.000249
	June	0.000832	0.0000761	0.000249
	July	0.00416	0.000380	0.00125
	August	0.00832	0.000761	0.00249
	September	0.0196	0.00179	0.00589
	October	0.00832	0.000761	0.00249
	November	0.0449	0.00411	0.0135
	December	0.0492	0.00450	0.0148

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

Appendix 8-G5aa. M19A Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Drinking Water Quality Guidelines
		Nitrite Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.00500	0.00500	0.00500	0.04	0.12	1
	February	0.00500	0.00500	0.00500	0.04	0.12	1
	March	0.00500	0.00500	0.00500	0.04	0.12	1
	April	0.000500	0.000500	0.000500	0.04	0.12	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.04	0.12	1
	July	0.00250	0.00250	0.00250	0.02	0.06	1
	August	0.00500	0.00500	0.00500	0.04	0.12	1
	September	0.00500	0.00500	0.00500	0.04	0.12	1
	October	0.00500	0.00500	0.00500	0.04	0.12	1
	November	0.00500	0.00500	0.00500	0.04	0.12	1
	December	0.00500	0.00500	0.00500	0.04	0.12	1
Operations (2018-2042)	January	0.00500	0.00500	0.00500	0.04	0.12	1
	February	0.00500	0.00500	0.00500	0.04	0.12	1
	March	0.00500	0.00500	0.00500	0.04	0.12	1
	April	0.000500	0.000500	0.000500	0.04	0.12	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.04	0.12	1
	July	0.00250	0.00250	0.00250	0.02	0.06	1
	August	0.00500	0.00500	0.00500	0.04	0.12	1
	September	0.00500	0.00500	0.00500	0.04	0.12	1
	October	0.00500	0.00500	0.00500	0.04	0.12	1
	November	0.00500	0.00500	0.00500	0.04	0.12	1
	December	0.00500	0.00500	0.00500	0.04	0.12	1
Closure (2043-2060)	January	0.00499	0.00499	0.00499	0.04	0.12	1
	February	0.00499	0.00499	0.00499	0.04	0.12	1
	March	0.00499	0.00499	0.00499	0.04	0.12	1
	April	0.000499	0.000499	0.000499	0.04	0.12	1
	May	0.000499	0.000499	0.000499	0.02	0.06	1
	June	0.000499	0.000499	0.000499	0.04	0.12	1
	July	0.00249	0.00249	0.00249	0.02	0.06	1
	August	0.00499	0.00499	0.00499	0.04	0.12	1
	September	0.00499	0.00499	0.00499	0.04	0.12	1
	October	0.00499	0.00499	0.00499	0.04	0.12	1
	November	0.00499	0.00499	0.00499	0.04	0.12	1
	December	0.00499	0.00499	0.00499	0.04	0.12	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are chloride dependent*

Appendix 8-G5aa. M19A Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean	Maximum Predicted vs. BC MOE Maximum	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.1250	0.042	0.00500
	February	0.1250	0.042	0.00500
	March	0.1250	0.042	0.00500
	April	0.01250	0.0042	0.000500
	May	0.0250	0.0083	0.000500
	June	0.01250	0.0042	0.000500
	July	0.125	0.042	0.00250
	August	0.1250	0.042	0.00500
	September	0.1250	0.042	0.00500
	October	0.1250	0.042	0.00500
	November	0.1250	0.042	0.00500
	December	0.1250	0.042	0.00500
Operations (2018-2042)	January	0.1249	0.042	0.00500
	February	0.1249	0.042	0.00500
	March	0.1249	0.042	0.00500
	April	0.01249	0.0042	0.000500
	May	0.0250	0.0083	0.000500
	June	0.01249	0.0042	0.000500
	July	0.125	0.042	0.00250
	August	0.1249	0.042	0.00500
	September	0.1249	0.042	0.00500
	October	0.1249	0.042	0.00500
	November	0.1249	0.042	0.00500
	December	0.1249	0.042	0.00500
Closure (2043-2060)	January	0.1247	0.042	0.00499
	February	0.1247	0.0416	0.00499
	March	0.1247	0.0416	0.00499
	April	0.01247	0.0042	0.000499
	May	0.0249	0.0083	0.000499
	June	0.01247	0.0042	0.000499
	July	0.125	0.042	0.00249
	August	0.1247	0.042	0.00499
	September	0.1247	0.042	0.00499
	October	0.1247	0.042	0.00499
	November	0.1247	0.042	0.00499
	December	0.1247	0.042	0.00499

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are chloride dependent*

Appendix 8-G5ab. M19A Creek Hazard Quotients for Ammonia, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Ammonia Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC MOE 30-Day Mean	Maximum Predicted vs. BC MOE Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
	February	0.00620	0.00620	0.00620	0.321	2.36	0.0193	0.00263
	March	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
	April	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
	May	0.00695	0.00695	0.00695	0.321	2.36	0.0216	0.00294
	June	0.00485	0.00485	0.00485	0.321	2.36	0.0151	0.00206
	July	0.0120	0.0120	0.0120	0.321	2.36	0.0374	0.00508
	August	0.00530	0.00530	0.00530	0.321	2.36	0.0165	0.00225
	September	0.00570	0.00570	0.00570	0.321	2.36	0.0178	0.00242
	October	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
	November	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
	December	0.00250	0.00250	0.00250	0.321	2.36	0.00779	0.00106
Operations (2018-2042)	January	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	February	0.00620	0.00620	0.00620	0.321	2.36	0.0193	0.00263
	March	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	April	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	May	0.00695	0.00695	0.00695	0.321	2.36	0.0216	0.00294
	June	0.00485	0.00485	0.00485	0.321	2.36	0.0151	0.00205
	July	0.0120	0.0120	0.0120	0.321	2.36	0.0374	0.00508
	August	0.00530	0.00530	0.00530	0.321	2.36	0.0165	0.00225
	September	0.00570	0.00570	0.00570	0.321	2.36	0.0177	0.00241
	October	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	November	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	December	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
Closure (2043-2060)	January	0.00249	0.00249	0.00249	0.321	2.36	0.00777	0.00106
	February	0.00618	0.00618	0.00618	0.321	2.36	0.0193	0.00262
	March	0.00250	0.00250	0.00250	0.321	2.36	0.00778	0.00106
	April	0.00249	0.00249	0.00249	0.321	2.36	0.00777	0.00106
	May	0.00694	0.00694	0.00694	0.321	2.36	0.0216	0.00294
	June	0.00484	0.00484	0.00484	0.321	2.36	0.0151	0.00205
	July	0.0120	0.0120	0.0120	0.321	2.36	0.0373	0.00507
	August	0.00529	0.00529	0.00529	0.321	2.36	0.0165	0.00224
	September	0.00569	0.00569	0.00569	0.321	2.36	0.0177	0.00241
	October	0.00249	0.00249	0.00249	0.321	2.36	0.00777	0.00106
	November	0.00249	0.00249	0.00249	0.321	2.36	0.00777	0.00106
	December	0.00249	0.00249	0.00249	0.321	2.36	0.00777	0.00106

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

¹ Guidelines are pH and temperature dependent

Appendix 8-G5ac. M19A Creek Hazard Quotients for Sulphate, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Sulphate Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	263	263	263	429	500	0.613	0.526
	February	308	308	308	429	500	0.718	0.616
	March	359	359	359	429	500	0.838	0.719
	April	106	106	106	429	500	0.247	0.212
	May	144	144	145	429	500	0.337	0.289
	June	95.9	95.9	95.9	429	500	0.224	0.192
	July	165	165	165	429	500	0.385	0.330
	August	168	168	168	429	500	0.392	0.336
	September	275	275	275	429	500	0.641	0.550
	October	285	285	285	429	500	0.664	0.570
	November	349	349	349	429	500	0.813	0.698
	December	356	356	356	429	500	0.830	0.712
Operations (2018-2042)	January	263	263	264	429	500	0.614	0.528
	February	308	308	309	429	500	0.719	0.617
	March	360	360	360	429	500	0.839	0.720
	April	106	106	106	429	500	0.247	0.212
	May	144	144	144	429	500	0.337	0.289
	June	95.9	95.9	96.0	429	500	0.224	0.192
	July	165	165	165	429	500	0.385	0.330
	August	168	168	168	429	500	0.392	0.336
	September	275	275	276	429	500	0.642	0.551
	October	285	285	285	429	500	0.665	0.571
	November	349	349	349	429	500	0.814	0.699
	December	356	356	356	429	500	0.830	0.713
Closure (2043-2060)	January	265	265	265	429	500	0.619	0.531
	February	311	311	311	429	500	0.724	0.621
	March	362	362	362	429	500	0.843	0.723
	April	106	106	106	429	500	0.247	0.212
	May	144	144	144	429	500	0.337	0.289
	June	96.2	96.2	96.2	429	500	0.224	0.192
	July	165	165	165	429	500	0.385	0.331
	August	168	168	168	429	500	0.392	0.336
	September	277	277	277	429	500	0.645	0.553
	October	286	286	286	429	500	0.667	0.572
	November	350	350	350	429	500	0.816	0.700
	December	357	357	357	429	500	0.833	0.715

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry Of Environment

DWQG = Drinking water quality guideline

¹: Guideline is hardness dependent

Appendix 8-G6
M19 Creek

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G6a. M19 Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality						Aquatic Life Guidelines for Dissolved Aluminum ¹	
		Dissolved Aluminum Concentration			Total Aluminum Concentration			BC MOE 30-Day Mean	BC MOE Maximum
		Median	Mean	Maximum	Median	Mean	Maximum		
Construction (2015-2017)	January	0.00150	0.00150	0.00150	0.0158	0.0158	0.0158	0.05	0.10
	February	0.00150	0.00150	0.00150	0.0115	0.0115	0.0115	0.05	0.10
	March	0.00150	0.00150	0.00150	0.0109	0.0109	0.0109	0.05	0.10
	April	0.00319	0.00319	0.00319	0.103	0.103	0.103	0.05	0.10
	May	0.0240	0.0240	0.0240	0.347	0.347	0.347	0.05	0.10
	June	0.0114	0.0114	0.0114	0.0812	0.0812	0.0813	0.05	0.10
	July	0.00742	0.00742	0.00743	0.0302	0.0302	0.0303	0.05	0.10
	August	0.00359	0.00359	0.00359	0.0149	0.0149	0.0149	0.05	0.10
	September	0.00150	0.00150	0.00150	0.0099	0.0099	0.0099	0.05	0.10
	October	0.00150	0.00150	0.00150	0.0108	0.0108	0.0108	0.05	0.10
	November	0.00150	0.00150	0.00150	0.00525	0.00525	0.00525	0.05	0.10
	December	0.00150	0.00150	0.00150	0.00648	0.00648	0.00649	0.05	0.10
Operations (2018-2042)	January	0.00206	0.00209	0.00279	0.0159	0.0159	0.0166	0.05	0.10
	February	0.00199	0.00202	0.00264	0.0117	0.0117	0.0123	0.05	0.10
	March	0.00191	0.00194	0.00245	0.0113	0.0113	0.0118	0.05	0.10
	April	0.00324	0.00325	0.00330	0.103	0.103	0.103	0.05	0.10
	May	0.0241	0.0241	0.0242	0.348	0.348	0.348	0.05	0.10
	June	0.0115	0.0115	0.0116	0.0816	0.0816	0.0817	0.05	0.10
	July	0.00755	0.00756	0.00768	0.0304	0.0304	0.0305	0.05	0.10
	August	0.00368	0.00369	0.00379	0.0150	0.0150	0.0151	0.05	0.10
	September	0.00198	0.00201	0.00257	0.0104	0.0104	0.0110	0.05	0.10
	October	0.00178	0.00179	0.00211	0.0109	0.0110	0.0113	0.05	0.10
	November	0.00180	0.00182	0.00215	0.00552	0.00554	0.00587	0.05	0.10
	December	0.00187	0.00189	0.00231	0.00684	0.00686	0.00727	0.05	0.10
Closure (2043-2060)	January	0.00339	0.00341	0.00366	0.0183	0.0183	0.0186	0.05	0.10
	February	0.00364	0.00365	0.00371	0.0141	0.0141	0.0142	0.05	0.10
	March	0.00342	0.00342	0.00343	0.0129	0.0129	0.0129	0.05	0.10
	April	0.00335	0.00335	0.00335	0.104	0.104	0.104	0.05	0.10
	May	0.0240	0.0240	0.0240	0.345	0.345	0.345	0.05	0.10
	June	0.0116	0.0116	0.0116	0.0810	0.0810	0.0810	0.05	0.10
	July	0.00776	0.00776	0.00776	0.0305	0.0305	0.0305	0.05	0.10
	August	0.00390	0.00390	0.00390	0.0152	0.0152	0.0152	0.05	0.10
	September	0.00294	0.00294	0.00294	0.0113	0.0113	0.0113	0.05	0.10
	October	0.00264	0.00264	0.00264	0.0122	0.0122	0.0122	0.05	0.10
	November	0.00264	0.00264	0.00264	0.00645	0.00645	0.00645	0.05	0.10
	December	0.00282	0.00282	0.00282	0.00784	0.00784	0.00784	0.05	0.10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are pH dependent*

Appendix 8-G6a. M19 Creek Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	BC MOE Working Water Quality Guidelines for Wildlife Water Supply for Total Aluminum BC MOE 30-Day Mean	Hazard Quotient relative to Aquatic Life Guideline for Dissolved Aluminum		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply for Total Aluminum
			Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	5	0.0300	0.0150	0.00315
	February	5	0.0300	0.0150	0.00230
	March	5	0.0300	0.0150	0.00218
	April	5	0.0638	0.0319	0.0207
	May	5	0.480	0.240	0.0694
	June	5	0.228	0.114	0.0162
	July	5	0.148	0.0743	0.00605
	August	5	0.0718	0.0359	0.00298
	September	5	0.0300	0.0150	0.00198
	October	5	0.0300	0.0150	0.00216
	November	5	0.0300	0.0150	0.00105
	December	5	0.0300	0.0150	0.00130
Operations (2018-2042)	January	5	0.0419	0.0279	0.00319
	February	5	0.0405	0.0264	0.00235
	March	5	0.0388	0.0245	0.00226
	April	5	0.0649	0.0330	0.0206
	May	5	0.483	0.242	0.0696
	June	5	0.230	0.116	0.0163
	July	5	0.151	0.0768	0.00608
	August	5	0.0738	0.0379	0.00300
	September	5	0.0402	0.0257	0.00208
	October	5	0.0358	0.0211	0.00219
	November	5	0.0363	0.0215	0.00111
	December	5	0.0379	0.0231	0.00137
Closure (2043-2060)	January	5	0.0682	0.0366	0.00367
	February	5	0.0729	0.0371	0.00283
	March	5	0.0684	0.0343	0.00258
	April	5	0.0671	0.0335	0.0209
	May	5	0.479	0.240	0.0690
	June	5	0.232	0.116	0.0162
	July	5	0.155	0.0776	0.00610
	August	5	0.0779	0.0390	0.00303
	September	5	0.0589	0.0294	0.00226
	October	5	0.0527	0.0264	0.00243
	November	5	0.0529	0.0264	0.00129
	December	5	0.0565	0.0282	0.00157

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are pH dependent*

Appendix 8-G6b. M19 Creek Hazard Quotients for Total Antimony, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Antimony Concentration			BC MOE Working Guideline	BC Working DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC Working DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	February	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	March	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	April	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	May	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	June	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	July	0.0000722	0.0000723	0.0000723	0.020	0.014	0.00361	0.00516
	August	0.0000722	0.0000723	0.0000723	0.020	0.014	0.00361	0.00516
	September	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	October	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	November	0.000149	0.000149	0.000149	0.020	0.014	0.00745	0.0106
	December	0.0000945	0.0000945	0.0000946	0.020	0.014	0.00473	0.00676
Operations (2018-2042)	January	0.0000609	0.0000612	0.0000740	0.020	0.014	0.00306	0.00529
	February	0.0000596	0.0000599	0.0000711	0.020	0.014	0.00300	0.00508
	March	0.0000581	0.0000583	0.0000676	0.020	0.014	0.00292	0.00483
	April	0.0000508	0.0000509	0.0000518	0.020	0.014	0.00254	0.00370
	May	0.0000508	0.0000509	0.0000518	0.020	0.014	0.00254	0.00370
	June	0.0000516	0.0000516	0.000053	0.020	0.014	0.00258	0.00381
	July	0.0000743	0.0000744	0.000077	0.020	0.014	0.00372	0.00547
	August	0.0000740	0.0000740	0.000076	0.020	0.014	0.00370	0.00541
	September	0.0000595	0.0000597	0.0000698	0.020	0.014	0.0030	0.00499
	October	0.0000554	0.0000556	0.0000613	0.020	0.014	0.00278	0.00438
	November	0.000155	0.000155	0.000161	0.020	0.014	0.00775	0.0115
	December	0.000102	0.000102	0.000110	0.020	0.014	0.00511	0.00784
Closure (2043-2060)	January	0.0000768	0.0000773	0.0000862	0.020	0.014	0.00387	0.00616
	February	0.0000803	0.0000805	0.0000826	0.020	0.014	0.00402	0.00590
	March	0.0000772	0.0000772	0.0000777	0.020	0.014	0.00386	0.00555
	April	0.0000526	0.0000526	0.0000526	0.020	0.014	0.00263	0.00375
	May	0.0000525	0.0000525	0.0000525	0.020	0.014	0.00263	0.00375
	June	0.0000546	0.0000546	0.0000546	0.020	0.014	0.00273	0.00390
	July	0.0000778	0.0000778	0.0000778	0.020	0.014	0.00389	0.00556
	August	0.0000767	0.0000767	0.0000767	0.020	0.014	0.00383	0.00548
	September	0.0000704	0.0000704	0.0000704	0.020	0.014	0.00352	0.00503
	October	0.0000661	0.0000661	0.0000661	0.020	0.014	0.00331	0.00472
	November	0.000165	0.000165	0.000165	0.020	0.014	0.00825	0.0118
	December	0.000113	0.000113	0.000113	0.020	0.014	0.00564	0.00805

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6c. M19 Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Arsenic Concentration			BC MOE Maximum	BC DWQG	Maximum
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000293	0.000293	0.000293	0.005	0.025	0.025
	February	0.000149	0.000149	0.000149	0.005	0.025	0.025
	March	0.000157	0.000157	0.000157	0.005	0.025	0.025
	April	0.000183	0.000183	0.000183	0.005	0.025	0.025
	May	0.000363	0.000363	0.000363	0.005	0.025	0.025
	June	0.000258	0.000258	0.000258	0.005	0.025	0.025
	July	0.000239	0.000239	0.000239	0.005	0.025	0.025
	August	0.000188	0.000188	0.000188	0.005	0.025	0.025
	September	0.000209	0.000209	0.000209	0.005	0.025	0.025
	October	0.000187	0.000187	0.000187	0.005	0.025	0.025
	November	0.000361	0.000361	0.000361	0.005	0.025	0.025
	December	0.000320	0.000320	0.000320	0.005	0.025	0.025
Operations (2018-2042)	January	0.000299	0.000299	0.000307	0.005	0.025	0.025
	February	0.000154	0.000154	0.000161	0.005	0.025	0.025
	March	0.000161	0.000161	0.000167	0.005	0.025	0.025
	April	0.000183	0.000183	0.000184	0.005	0.025	0.025
	May	0.000364	0.000364	0.000365	0.005	0.025	0.025
	June	0.000259	0.000259	0.000260	0.005	0.025	0.025
	July	0.000240	0.000240	0.000241	0.005	0.025	0.025
	August	0.000188	0.000188	0.000189	0.005	0.025	0.025
	September	0.000214	0.000214	0.000220	0.005	0.025	0.025
	October	0.000189	0.000190	0.000193	0.005	0.025	0.025
	November	0.000364	0.000364	0.000368	0.005	0.025	0.025
	December	0.000324	0.000324	0.000329	0.005	0.025	0.025
Closure (2043-2060)	January	0.000301	0.000301	0.000310	0.005	0.025	0.025
	February	0.000157	0.000157	0.000159	0.005	0.025	0.025
	March	0.000164	0.000164	0.000164	0.005	0.025	0.025
	April	0.000185	0.000185	0.000185	0.005	0.025	0.025
	May	0.000362	0.000362	0.000362	0.005	0.025	0.025
	June	0.000259	0.000259	0.000259	0.005	0.025	0.025
	July	0.000241	0.000241	0.000241	0.005	0.025	0.025
	August	0.000189	0.000189	0.000189	0.005	0.025	0.025
	September	0.000215	0.000215	0.000215	0.005	0.025	0.025
	October	0.000191	0.000191	0.000191	0.005	0.025	0.025
	November	0.000366	0.000366	0.000366	0.005	0.025	0.025
	December	0.000325	0.000325	0.000325	0.005	0.025	0.025

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6c. M19 Creek Hazard Quotients for Total Arsenic, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0587	0.0117	0.0117
	February	0.0298	0.00595	0.00595
	March	0.0313	0.00627	0.00627
	April	0.0367	0.00733	0.00733
	May	0.0726	0.0145	0.0145
	June	0.0516	0.0103	0.0103
	July	0.0478	0.00956	0.00956
	August	0.0376	0.00751	0.00751
	September	0.0418	0.00835	0.00835
	October	0.0373	0.00747	0.00747
	November	0.0722	0.0144	0.0144
	December	0.0640	0.0128	0.0128
Operations (2018-2042)	January	0.0613	0.0123	0.0123
	February	0.0321	0.00643	0.00643
	March	0.0333	0.00666	0.00666
	April	0.0367	0.00734	0.00734
	May	0.0729	0.0146	0.0146
	June	0.0520	0.0104	0.0104
	July	0.0482	0.00964	0.00964
	August	0.0379	0.00757	0.00757
	September	0.0440	0.00880	0.00880
	October	0.0386	0.00772	0.00772
	November	0.0735	0.0147	0.0147
	December	0.0657	0.0131	0.0131
Closure (2043-2060)	January	0.0620	0.0124	0.0124
	February	0.0319	0.0064	0.00637
	March	0.0329	0.00658	0.00658
	April	0.0370	0.00740	0.00740
	May	0.0725	0.0145	0.0145
	June	0.0517	0.0103	0.0103
	July	0.0481	0.00962	0.00962
	August	0.0379	0.00758	0.00758
	September	0.0429	0.00858	0.00858
	October	0.0382	0.00765	0.00765
	November	0.0732	0.0146	0.0146
	December	0.0650	0.0130	0.0130

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6d. M19 Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Barium Concentration			BC MOE 30-Day Mean Working Guideline	BC MOE Maximum Working Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.138	0.138	0.138	1	5	1
	February	0.150	0.150	0.150	1	5	1
	March	0.154	0.154	0.154	1	5	1
	April	0.123	0.123	0.123	1	5	1
	May	0.093	0.093	0.093	1	5	1
	June	0.098	0.098	0.098	1	5	1
	July	0.144	0.144	0.144	1	5	1
	August	0.100	0.100	0.100	1	5	1
	September	0.176	0.176	0.176	1	5	1
	October	0.156	0.156	0.156	1	5	1
	November	0.151	0.151	0.151	1	5	1
	December	0.147	0.147	0.147	1	5	1
Operations (2018-2042)	January	0.142	0.142	0.145	1	5	1
	February	0.153	0.153	0.156	1	5	1
	March	0.156	0.156	0.159	1	5	1
	April	0.123	0.123	0.123	1	5	1
	May	0.093	0.093	0.093	1	5	1
	June	0.099	0.099	0.099	1	5	1
	July	0.145	0.145	0.145	1	5	1
	August	0.100	0.101	0.101	1	5	1
	September	0.179	0.179	0.182	1	5	1
	October	0.158	0.158	0.160	1	5	1
	November	0.153	0.153	0.154	1	5	1
	December	0.149	0.149	0.151	1	5	1
Closure (2043-2060)	January	0.160	0.159	0.160	1	5	1
	February	0.174	0.174	0.174	1	5	1
	March	0.175	0.175	0.175	1	5	1
	April	0.124	0.124	0.124	1	5	1
	May	0.095	0.095	0.095	1	5	1
	June	0.102	0.102	0.102	1	5	1
	July	0.148	0.148	0.148	1	5	1
	August	0.105	0.105	0.105	1	5	1
	September	0.192	0.192	0.192	1	5	1
	October	0.169	0.169	0.169	1	5	1
	November	0.164	0.164	0.164	1	5	1
	December	0.162	0.162	0.162	1	5	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6d. M19 Creek Hazard Quotients for Total Barium, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Working Guideline	Maximum Predicted vs. BC MOE Maximum Working Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.138	0.0276	0.138
	February	0.150	0.0300	0.150
	March	0.154	0.0308	0.154
	April	0.123	0.0245	0.123
	May	0.093	0.0185	0.093
	June	0.098	0.0196	0.098
	July	0.144	0.0288	0.144
	August	0.100	0.0201	0.100
	September	0.176	0.0352	0.176
	October	0.156	0.0313	0.156
	November	0.151	0.0302	0.151
	December	0.147	0.0293	0.147
Operations (2018-2042)	January	0.142	0.0291	0.145
	February	0.153	0.0312	0.156
	March	0.156	0.0318	0.159
	April	0.123	0.0246	0.123
	May	0.093	0.0186	0.093
	June	0.099	0.0198	0.099
	July	0.145	0.0290	0.145
	August	0.101	0.0202	0.101
	September	0.179	0.0364	0.182
	October	0.158	0.0319	0.160
	November	0.153	0.0309	0.154
	December	0.149	0.0302	0.151
Closure (2043-2060)	January	0.159	0.0319	0.160
	February	0.174	0.0348	0.174
	March	0.175	0.0351	0.175
	April	0.124	0.0249	0.124
	May	0.095	0.0190	0.095
	June	0.102	0.0204	0.102
	July	0.148	0.0297	0.148
	August	0.105	0.0209	0.105
	September	0.192	0.0385	0.192
	October	0.169	0.0339	0.169
	November	0.164	0.0329	0.164
	December	0.162	0.0324	0.162

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6e. M19 Creek Hazard Quotients for Total Beryllium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Beryllium Concentration			BC MOE Working Guideline	BC DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	February	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	March	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	April	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	May	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	June	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	July	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	August	0.0000722	0.0000723	0.0000723	0.0053	0.004	0.0136	0.0181
	September	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	October	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	November	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
	December	0.0000500	0.0000500	0.0000500	0.0053	0.004	0.00943	0.0125
Operations (2018-2042)	January	0.0000506	0.0000506	0.0000511	0.0053	0.004	0.00963	0.0128
	February	0.0000505	0.0000505	0.0000509	0.0053	0.004	0.00961	0.0127
	March	0.0000504	0.0000504	0.0000508	0.0053	0.004	0.00958	0.0127
	April	0.0000500	0.0000500	0.0000501	0.0053	0.004	0.00945	0.0125
	May	0.0000500	0.0000500	0.0000501	0.0053	0.004	0.00945	0.0125
	June	0.0000501	0.0000501	0.0000501	0.0053	0.004	0.00946	0.0125
	July	0.0000501	0.0000501	0.0000502	0.0053	0.004	0.00947	0.0125
	August	0.0000725	0.0000724	0.0000725	0.0053	0.004	0.0137	0.0181
	September	0.0000505	0.0000505	0.0000508	0.0053	0.004	0.00959	0.0127
	October	0.0000503	0.0000503	0.0000505	0.0053	0.004	0.00952	0.0126
	November	0.0000503	0.0000503	0.0000505	0.0053	0.004	0.00953	0.0126
	December	0.0000504	0.0000503	0.0000506	0.0053	0.004	0.00955	0.0127
Closure (2043-2060)	January	0.0000536	0.0000535	0.0000536	0.0053	0.004	0.0101	0.0134
	February	0.0000540	0.0000540	0.0000540	0.0053	0.004	0.0102	0.0135
	March	0.0000536	0.0000536	0.0000536	0.0053	0.004	0.0101	0.0134
	April	0.0000503	0.0000503	0.0000503	0.0053	0.004	0.00950	0.0126
	May	0.0000503	0.0000503	0.0000503	0.0053	0.004	0.00949	0.0126
	June	0.0000506	0.0000506	0.0000506	0.0053	0.004	0.00955	0.0126
	July	0.0000508	0.0000508	0.0000508	0.0053	0.004	0.00958	0.0127
	August	0.0000726	0.0000726	0.0000726	0.0053	0.004	0.0137	0.0182
	September	0.0000527	0.0000527	0.0000527	0.0053	0.004	0.00995	0.0132
	October	0.0000521	0.0000521	0.0000521	0.0053	0.004	0.00984	0.0130
	November	0.0000521	0.0000521	0.0000521	0.0053	0.004	0.00984	0.0130
	December	0.0000525	0.0000525	0.0000525	0.0053	0.004	0.00990	0.0131

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6f. M19 Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Boron Concentration			BC MOE Maximum	BC DWQG	Maximum
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.00555	0.00555	0.00555	1.2	5	5
	February	0.00600	0.00599	0.00600	1.2	5	5
	March	0.00577	0.00577	0.00578	1.2	5	5
	April	0.00588	0.00588	0.00589	1.2	5	5
	May	0.00861	0.00861	0.00861	1.2	5	5
	June	0.00605	0.00604	0.00605	1.2	5	5
	July	0.0124	0.0124	0.0124	1.2	5	5
	August	0.0332	0.0332	0.0333	1.2	5	5
	September	0.0125	0.0125	0.0126	1.2	5	5
	October	0.00599	0.00599	0.00600	1.2	5	5
	November	0.00599	0.00599	0.00600	1.2	5	5
	December	0.00620	0.00620	0.00622	1.2	5	5
Operations (2018-2042)	January	0.00606	0.00607	0.00666	1.2	5	5
	February	0.00642	0.00643	0.00694	1.2	5	5
	March	0.00614	0.00614	0.00657	1.2	5	5
	April	0.00588	0.00588	0.00592	1.2	5	5
	May	0.00862	0.00862	0.00866	1.2	5	5
	June	0.00607	0.00607	0.00615	1.2	5	5
	July	0.0125	0.0125	0.0126	1.2	5	5
	August	0.0334	0.0334	0.0335	1.2	5	5
	September	0.0130	0.0130	0.0135	1.2	5	5
	October	0.00621	0.00621	0.00648	1.2	5	5
	November	0.00624	0.00624	0.00652	1.2	5	5
	December	0.00652	0.00652	0.00686	1.2	5	5
Closure (2043-2060)	January	0.00830	0.00830	0.00830	1.2	5	5
	February	0.00914	0.00914	0.00914	1.2	5	5
	March	0.00859	0.00859	0.00859	1.2	5	5
	April	0.00621	0.00621	0.00621	1.2	5	5
	May	0.00891	0.00891	0.00891	1.2	5	5
	June	0.00660	0.00660	0.00660	1.2	5	5
	July	0.0131	0.0131	0.0131	1.2	5	5
	August	0.0336	0.0336	0.0336	1.2	5	5
	September	0.0147	0.0147	0.0147	1.2	5	5
	October	0.00770	0.00770	0.00770	1.2	5	5
	November	0.00771	0.00771	0.00771	1.2	5	5
	December	0.00821	0.00821	0.00821	1.2	5	5

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6f. M19 Creek Hazard Quotients for Total Boron, Base Case

Project Phase	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	0.00463	0.00111	0.00111
	0.00500	0.00120	0.00120
	0.00481	0.00116	0.00116
	0.00491	0.00118	0.00118
	0.00717	0.00172	0.00172
	0.00504	0.00121	0.00121
	0.0104	0.00249	0.00249
	0.0277	0.00665	0.00665
	0.0105	0.00251	0.00251
	0.00500	0.00120	0.00120
0.00500	0.00120	0.00120	
0.00518	0.00124	0.00124	
Operations (2018-2042)	0.00555	0.00133	0.00133
	0.00578	0.00139	0.00139
	0.00547	0.00131	0.00131
	0.00493	0.00118	0.00118
	0.00722	0.00173	0.00173
	0.00512	0.00123	0.00123
	0.0105	0.00252	0.00252
	0.0279	0.00670	0.00670
	0.0112	0.00269	0.00269
	0.00540	0.00130	0.00130
0.00543	0.00130	0.00130	
0.00572	0.00137	0.00137	
Closure (2043-2060)	0.00692	0.00166	0.00166
	0.00762	0.00183	0.00183
	0.00716	0.00172	0.00172
	0.00518	0.00124	0.00124
	0.00743	0.00178	0.00178
	0.00550	0.00132	0.00132
	0.0109	0.00261	0.00261
	0.0280	0.00671	0.00671
	0.0122	0.00293	0.00293
	0.00642	0.00154	0.00154
0.00643	0.00154	0.00154	
0.00684	0.00164	0.00164	

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6g. M19 Creek Hazard Quotients for Total Cadmium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Cadmium Concentration						
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000136	0.0000135	0.0000136	0.0001	0.005	0.23892	0.00271
	February	0.00001200	0.00001199	0.00001200	0.0001	0.005	0.205379	0.00240
	March	0.0000139	0.0000139	0.0000139	0.0001	0.005	0.23503	0.00279
	April	0.0000182	0.0000182	0.0000182	0.0001	0.005	0.35769	0.00364
	May	0.0000307	0.0000307	0.0000307	0.0000	0.005	0.92135	0.00614
	June	0.0000151	0.0000151	0.0000151	0.0000	0.005	0.39628	0.00303
	July	0.0000158	0.0000158	0.0000158	0.0000	0.005	0.31729	0.00316
	August	0.0000156	0.0000156	0.0000156	0.0002	0.005	0.094202	0.00311
	September	0.0000192	0.0000192	0.0000192	0.0001	0.005	0.32574	0.00385
	October	0.0000139	0.0000139	0.0000139	0.0001	0.005	0.24831	0.00278
	November	0.0000131	0.0000131	0.0000131	0.0001	0.005	0.233273	0.00262
	December	0.0000129	0.0000129	0.0000129	0.0001	0.005	0.232017	0.00258
Operations (2018-2042)	January	0.0000139	0.0000140	0.0000144	0.0001	0.005	0.25415	0.00288
	February	0.00001231	0.00001236	0.0000127	0.0001	0.005	0.218245	0.00255
	March	0.0000142	0.0000143	0.0000146	0.0001	0.005	0.24597	0.00292
	April	0.0000182	0.0000182	0.0000182	0.0001	0.005	0.35756	0.00364
	May	0.0000308	0.0000308	0.0000308	0.0000	0.005	0.92500	0.00616
	June	0.0000152	0.0000152	0.0000153	0.0000	0.005	0.40051	0.00306
	July	0.0000159	0.0000159	0.0000159	0.0000	0.005	0.32064	0.00319
	August	0.0000156	0.0000156	0.0000157	0.0002	0.005	0.095074	0.00314
	September	0.0000196	0.0000197	0.0000200	0.0001	0.005	0.33888	0.00400
	October	0.0000141	0.0000141	0.0000143	0.0001	0.005	0.25595	0.00286
	November	0.0000133	0.0000133	0.0000136	0.0001	0.005	0.24126	0.00271
	December	0.0000132	0.0000132	0.0000134	0.0001	0.005	0.24196	0.00269
Closure (2043-2060)	January	0.0000162	0.0000162	0.0000162	0.0001	0.005	0.28513	0.00323
	February	0.0000149	0.0000149	0.0000149	0.0001	0.005	0.255889	0.00299
	March	0.0000165	0.0000165	0.0000165	0.0001	0.005	0.27895	0.00331
	April	0.0000186	0.0000186	0.0000186	0.0001	0.005	0.36421	0.00371
	May	0.0000308	0.0000308	0.0000308	0.0000	0.005	0.92455	0.00616
	June	0.0000155	0.0000155	0.0000155	0.0000	0.005	0.40540	0.00310
	July	0.0000163	0.0000163	0.0000163	0.0000	0.005	0.32778	0.00326
	August	0.0000160	0.0000160	0.0000160	0.0002	0.005	0.096588	0.00319
	September	0.0000211	0.0000211	0.0000211	0.0001	0.005	0.35725	0.00422
	October	0.0000154	0.0000154	0.0000154	0.0001	0.005	0.27532	0.00308
	November	0.0000147	0.0000147	0.0000147	0.0001	0.005	0.26067	0.00293
	December	0.0000147	0.0000147	0.0000147	0.0001	0.005	0.26415	0.00293

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking Water Quality guideline

¹ Guideline is hardness dependent

Appendix 8-G6h. M19 Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Chromium Concentration			CCME Cr VI Guideline	CCME CR III Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0000622	0.0000621	0.0000622	0.001	0.0089	0.05
	February	0.0000688	0.0000687	0.0000688	0.001	0.0089	0.05
	March	0.0000528	0.0000528	0.0000528	0.001	0.0089	0.05
	April	0.000244	0.000244	0.000244	0.001	0.0089	0.05
	May	0.000683	0.000683	0.000683	0.001	0.0089	0.05
	June	0.000229	0.000229	0.000229	0.001	0.0089	0.05
	July	0.000139	0.000139	0.000139	0.001	0.0089	0.05
	August	0.000166	0.000166	0.000166	0.001	0.0089	0.05
	September	0.000110	0.000110	0.000110	0.001	0.0089	0.05
	October	0.0000500	0.0000500	0.0000500	0.001	0.0089	0.05
	November	0.000111	0.000111	0.000111	0.001	0.0089	0.05
	December	0.0000942	0.0000942	0.0000944	0.001	0.0089	0.05
Operations (2018-2042)	January	0.0000627	0.0000627	0.0000639	0.001	0.0089	0.05
	February	0.0000688	0.0000689	0.0000699	0.001	0.0089	0.05
	March	0.0000535	0.0000535	0.0000544	0.001	0.0089	0.05
	April	0.000244	0.000244	0.000244	0.001	0.0089	0.05
	May	0.000685	0.000685	0.000685	0.001	0.0089	0.05
	June	0.000230	0.000230	0.000230	0.001	0.0089	0.05
	July	0.000140	0.000140	0.000140	0.001	0.0089	0.05
	August	0.000166	0.000166	0.000166	0.001	0.0089	0.05
	September	0.000111	0.000111	0.000112	0.001	0.0089	0.05
	October	0.0000506	0.0000506	0.0000512	0.001	0.0089	0.05
	November	0.000112	0.000112	0.000112	0.001	0.0089	0.05
	December	0.0000943	0.0000944	0.0000951	0.001	0.0089	0.05
Closure (2043-2060)	January	0.0000681	0.0000681	0.0000682	0.001	0.0089	0.05
	February	0.0000759	0.0000759	0.0000759	0.001	0.0089	0.05
	March	0.0000580	0.0000580	0.0000580	0.001	0.0089	0.05
	April	0.000246	0.000246	0.000246	0.001	0.0089	0.05
	May	0.000679	0.000679	0.000679	0.001	0.0089	0.05
	June	0.000229	0.000229	0.000229	0.001	0.0089	0.05
	July	0.000139	0.000139	0.000139	0.001	0.0089	0.05
	August	0.000166	0.000166	0.000166	0.001	0.0089	0.05
	September	0.000114	0.000114	0.000114	0.001	0.0089	0.05
	October	0.0000530	0.0000530	0.0000530	0.001	0.0089	0.05
	November	0.000114	0.000114	0.000114	0.001	0.0089	0.05
	December	0.0000989	0.0000989	0.0000989	0.001	0.0089	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking Water Quality guideline

CCME = Canadian Council of Ministers of the Environment

Appendix 8-G6h. M19 Creek Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Maximum Predicted vs. BC MOE Cr VI Working Guideline	Maximum Predicted vs. BC MOE Cr III Working Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.0622	0.00699	0.00124
	February	0.0688	0.00774	0.00138
	March	0.0528	0.00593	0.00106
	April	0.244	0.0275	0.00489
	May	0.683	0.0767	0.0137
	June	0.229	0.0257	0.00458
	July	0.139	0.0156	0.00278
	August	0.166	0.0186	0.00331
	September	0.110	0.0124	0.00220
	October	0.0500	0.00562	0.00100
	November	0.111	0.0125	0.00222
	December	0.0944	0.0106	0.00189
Operations (2018-2042)	January	0.0639	0.00718	0.00128
	February	0.0699	0.00785	0.00140
	March	0.0544	0.00611	0.00109
	April	0.244	0.0274	0.00488
	May	0.685	0.0770	0.0137
	June	0.230	0.0258	0.00460
	July	0.140	0.0157	0.00280
	August	0.166	0.0186	0.00332
	September	0.112	0.0126	0.00224
	October	0.0512	0.00575	0.00102
	November	0.112	0.0126	0.00225
	December	0.0951	0.0107	0.00190
Closure (2043-2060)	January	0.0682	0.00766	0.00136
	February	0.0759	0.00853	0.00152
	March	0.0580	0.00652	0.00116
	April	0.246	0.0276	0.00492
	May	0.679	0.0763	0.0136
	June	0.229	0.0257	0.00458
	July	0.139	0.0156	0.00278
	August	0.166	0.0187	0.00333
	September	0.114	0.0128	0.00227
	October	0.0530	0.00595	0.00106
	November	0.114	0.0128	0.00228
	December	0.0989	0.0111	0.00198

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking Water Quality guideline

CCME = Canadian Council of Ministers of the Environment

Appendix 8-G6i. M19 Creek Hazard Quotients for Total Cobalt, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Cobalt Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000810	0.0000809	0.0000810	0.004	0.110	0.0202	0.000737
	February	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	March	0.0000616	0.0000616	0.0000616	0.004	0.110	0.0154	0.000560
	April	0.0000644	0.0000643	0.0000644	0.004	0.110	0.0161	0.000586
	May	0.000262	0.000262	0.000262	0.004	0.110	0.0655	0.00238
	June	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	July	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	August	0.0000722	0.0000723	0.0000723	0.004	0.110	0.0181	0.000657
	September	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	October	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	November	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	December	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
Operations (2018-2042)	January	0.0000855	0.0000865	0.0000934	0.004	0.110	0.0216	0.000849
	February	0.0000554	0.0000563	0.0000624	0.004	0.110	0.0141	0.000568
	March	0.0000656	0.0000663	0.0000713	0.004	0.110	0.0166	0.000648
	April	0.0000643	0.0000642	0.0000646	0.004	0.110	0.0160	0.000587
	May	0.000263	0.000263	0.000264	0.004	0.110	0.0658	0.00240
	June	0.0000509	0.0000510	0.0000519	0.004	0.110	0.0127	0.000472
	July	0.0000511	0.0000513	0.0000524	0.004	0.110	0.0128	0.000477
	August	0.0000733	0.0000734	0.0000743	0.004	0.110	0.0183	0.000676
	September	0.0000554	0.0000560	0.0000614	0.004	0.110	0.0140	0.000559
	October	0.0000531	0.0000534	0.0000565	0.004	0.110	0.0134	0.000513
	November	0.0000534	0.0000537	0.0000570	0.004	0.110	0.0134	0.000518
	December	0.0000542	0.0000546	0.0000586	0.004	0.110	0.0136	0.000533
Closure (2043-2060)	January	0.000110	0.000110	0.000110	0.004	0.110	0.0275	0.00100
	February	0.0000800	0.0000800	0.0000800	0.004	0.110	0.0200	0.000727
	March	0.0000893	0.0000893	0.0000893	0.004	0.110	0.0223	0.000812
	April	0.0000680	0.0000680	0.0000680	0.004	0.110	0.0170	0.000619
	May	0.000263	0.000263	0.000263	0.004	0.110	0.0657	0.00239
	June	0.0000545	0.0000545	0.0000545	0.004	0.110	0.0136	0.000496
	July	0.0000557	0.0000557	0.0000557	0.004	0.110	0.0139	0.000506
	August	0.0000766	0.0000766	0.0000766	0.004	0.110	0.0191	0.000696
	September	0.0000703	0.0000703	0.0000703	0.004	0.110	0.0176	0.000639
	October	0.0000659	0.0000659	0.0000659	0.004	0.110	0.0165	0.000599
	November	0.0000660	0.0000660	0.0000660	0.004	0.110	0.0165	0.000600
	December	0.0000685	0.0000685	0.0000685	0.004	0.110	0.0171	0.000623

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6j. M19 Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Copper Concentration			BC MOE 30-Day Mean	BC MOE Maximum	
		Median	Mean	Maximum			30-Day Mean
Construction (2015-2017)	January	0.000593	0.000593	0.000593	0.00748	0.0196	0.3
	February	0.000539	0.000539	0.000539	0.00774	0.0202	0.3
	March	0.000652	0.000652	0.000652	0.00788	0.0205	0.3
	April	0.000674	0.000674	0.000674	0.00660	0.0175	0.3
	May	0.00128	0.00128	0.00128	0.00403	0.0115	0.3
	June	0.000804	0.000804	0.000804	0.00472	0.0131	0.3
	July	0.000884	0.000884	0.000884	0.00642	0.0171	0.3
	August	0.000682	0.000682	0.000682	0.0259	0.0629	0.3
	September	0.000820	0.000820	0.000821	0.00784	0.0204	0.3
	October	0.000777	0.000777	0.000777	0.00736	0.0193	0.3
	November	0.000601	0.000601	0.000601	0.00740	0.0194	0.3
	December	0.000562	0.000562	0.000562	0.00730	0.0192	0.3
Operations (2018-2042)	January	0.000611	0.000612	0.000633	0.00748	0.0196	0.3
	February	0.000556	0.000557	0.000576	0.00774	0.0202	0.3
	March	0.000666	0.000667	0.000682	0.00788	0.0205	0.3
	April	0.000674	0.000674	0.000676	0.00660	0.0175	0.3
	May	0.00128	0.00128	0.00128	0.00403	0.0115	0.3
	June	0.000808	0.000808	0.000811	0.00472	0.0131	0.3
	July	0.000889	0.000889	0.000893	0.00642	0.0171	0.3
	August	0.000687	0.000687	0.000690	0.0259	0.0629	0.3
	September	0.000838	0.000839	0.000855	0.00784	0.0204	0.3
	October	0.000786	0.000786	0.000796	0.00736	0.0193	0.3
	November	0.000610	0.000611	0.000621	0.00740	0.0194	0.3
	December	0.000575	0.000575	0.000588	0.00730	0.0192	0.3
Closure (2043-2060)	January	0.000638	0.000639	0.000650	0.00748	0.0196	0.3
	February	0.000587	0.000587	0.000590	0.00774	0.0202	0.3
	March	0.000695	0.000695	0.000696	0.00788	0.0205	0.3
	April	0.000680	0.000680	0.000680	0.00660	0.0175	0.3
	May	0.00128	0.00128	0.00128	0.00403	0.0115	0.3
	June	0.000810	0.000810	0.000810	0.00472	0.0131	0.3
	July	0.000890	0.000890	0.000890	0.00642	0.0171	0.3
	August	0.000685	0.000685	0.000685	0.0259	0.0629	0.3
	September	0.000848	0.000848	0.000848	0.00784	0.0204	0.3
	October	0.000803	0.000803	0.000803	0.00736	0.0193	0.3
	November	0.000628	0.000628	0.000628	0.00740	0.0194	0.3
	December	0.000590	0.000590	0.000590	0.00730	0.0192	0.3

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6j. M19 Creek Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean	Maximum Predicted vs. BC Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.0793	0.0303	0.00198
	February	0.0697	0.0267	0.00180
	March	0.0827	0.0318	0.00217
	April	0.102	0.0385	0.00225
	May	0.317	0.112	0.00426
	June	0.170	0.0614	0.00268
	July	0.138	0.0517	0.00295
	August	0.0263	0.0108	0.00227
	September	0.105	0.0402	0.00273
	October	0.106	0.0403	0.00259
	November	0.0812	0.0310	0.00200
	December	0.0769	0.0293	0.00187
Operations (2018-2042)	January	0.0818	0.0323	0.00204
	February	0.0720	0.0285	0.00186
	March	0.0846	0.0332	0.00222
	April	0.102	0.0386	0.00225
	May	0.318	0.112	0.00427
	June	0.171	0.0619	0.00269
	July	0.138	0.0522	0.00296
	August	0.0265	0.0110	0.00229
	September	0.107	0.0419	0.00280
	October	0.107	0.0412	0.00262
	November	0.0826	0.0320	0.00204
	December	0.0788	0.0307	0.00192
Closure (2043-2060)	January	0.0854	0.0332	0.00213
	February	0.0759	0.0292	0.00196
	March	0.0882	0.0339	0.00232
	April	0.103	0.0389	0.00227
	May	0.317	0.111	0.00425
	June	0.172	0.0618	0.00270
	July	0.139	0.0521	0.00297
	August	0.0264	0.0109	0.00228
	September	0.108	0.0415	0.00283
	October	0.109	0.0416	0.00268
	November	0.0849	0.0324	0.00209
	December	0.0808	0.0308	0.00197

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6k. M19 Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Predicted Water Quality					
		Dissolved Iron Concentration			Total Iron Concentration		
		Median	Mean	Maximum	Median	Mean	Maximum
Construction (2015-2017)	January	0.0248	0.0248	0.0248	0.0588	0.0587	0.0588
	February	0.0150	0.0150	0.0150	0.0260	0.0259	0.0260
	March	0.0150	0.0150	0.0150	0.0288	0.0288	0.0288
	April	0.0684	0.0684	0.0684	0.227	0.227	0.227
	May	0.0737	0.0737	0.0738	0.545	0.545	0.545
	June	0.0737	0.0737	0.0738	0.160	0.160	0.161
	July	0.0404	0.0404	0.0404	0.0644	0.0644	0.0644
	August	0.0315	0.0315	0.0315	0.0484	0.0484	0.0484
	September	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
	October	0.0150	0.0150	0.0150	0.0177	0.0177	0.0178
	November	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150
	December	0.0199	0.0199	0.0199	0.0237	0.0237	0.0237
Operations (2018-2042)	January	0.0252	0.0252	0.0256	0.0581	0.0579	0.0584
	February	0.0153	0.0153	0.0156	0.0258	0.0257	0.0260
	March	0.0152	0.0153	0.0155	0.0290	0.0291	0.0293
	April	0.0686	0.0686	0.0686	0.226	0.226	0.227
	May	0.0741	0.0741	0.0742	0.547	0.546	0.547
	June	0.0741	0.0741	0.0742	0.161	0.161	0.161
	July	0.0406	0.0406	0.0406	0.0646	0.0646	0.0647
	August	0.0316	0.0316	0.0317	0.0486	0.0486	0.0487
	September	0.0153	0.0153	0.0156	0.0153	0.0153	0.0156
	October	0.0152	0.0152	0.0153	0.0178	0.0178	0.0179
	November	0.0152	0.0152	0.0154	0.0152	0.0152	0.0154
	December	0.0201	0.0201	0.0204	0.0239	0.0240	0.0242
Closure (2043-2060)	January	0.0272	0.0271	0.0272	0.0632	0.0631	0.0632
	February	0.0178	0.0178	0.0178	0.0296	0.0296	0.0296
	March	0.0175	0.0175	0.0175	0.0314	0.0314	0.0314
	April	0.0683	0.0683	0.0683	0.229	0.229	0.229
	May	0.0733	0.0733	0.0733	0.542	0.542	0.542
	June	0.0735	0.0735	0.0735	0.160	0.160	0.160
	July	0.0406	0.0406	0.0406	0.0646	0.0646	0.0646
	August	0.0317	0.0317	0.0317	0.0484	0.0484	0.0484
	September	0.0169	0.0169	0.0169	0.0169	0.0169	0.0169
	October	0.0165	0.0165	0.0165	0.0195	0.0195	0.0195
	November	0.0165	0.0165	0.0165	0.0165	0.0165	0.0165
	December	0.0216	0.0216	0.0216	0.0253	0.0253	0.0253

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6k. M19 Creek Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		BC MOE Maximum Guideline for Dissolved Iron	BC MOE Maximum Guideline for Total Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Dissolved Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Total Iron
Construction (2015-2017)	January	0.35	1	0.0708	0.0588
	February	0.35	1	0.0429	0.0260
	March	0.35	1	0.0429	0.0288
	April	0.35	1	0.195	0.227
	May	0.35	1	0.211	0.545
	June	0.35	1	0.211	0.161
	July	0.35	1	0.115	0.0644
	August	0.35	1	0.0900	0.0484
	September	0.35	1	0.0429	0.0150
	October	0.35	1	0.0429	0.0178
	November	0.35	1	0.0429	0.0150
	December	0.35	1	0.0569	0.0237
Operations (2018-2042)	January	0.35	1	0.0731	0.0584
	February	0.35	1	0.0447	0.0260
	March	0.35	1	0.0444	0.0293
	April	0.35	1	0.196	0.227
	May	0.35	1	0.212	0.547
	June	0.35	1	0.212	0.161
	July	0.35	1	0.116	0.0647
	August	0.35	1	0.0905	0.0487
	September	0.35	1	0.0445	0.0156
	October	0.35	1	0.0438	0.0179
	November	0.35	1	0.0439	0.0154
	December	0.35	1	0.0582	0.0242
Closure (2043-2060)	January	0.35	1	0.0777	0.0632
	February	0.35	1	0.0509	0.0296
	March	0.35	1	0.0501	0.0314
	April	0.35	1	0.195	0.229
	May	0.35	1	0.210	0.542
	June	0.35	1	0.210	0.160
	July	0.35	1	0.116	0.0646
	August	0.35	1	0.0906	0.0484
	September	0.35	1	0.0483	0.0169
	October	0.35	1	0.0471	0.0195
	November	0.35	1	0.0471	0.0165
	December	0.35	1	0.0617	0.0253

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6L. M19 Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	BC MOE 30-Day Mean
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000489	0.0000488	0.0000489	0.0104	0.122	0.05	0.1
	February	0.0000310	0.0000310	0.0000310	0.0107	0.127	0.05	0.1
	March	0.0000250	0.0000250	0.0000250	0.0109	0.130	0.05	0.1
	April	0.0000994	0.0000993	0.0000994	0.00933	0.104	0.05	0.1
	May	0.000299	0.000299	0.000299	0.00652	0.0553	0.05	0.1
	June	0.0000870	0.0000871	0.0000871	0.00724	0.0677	0.05	0.1
	July	0.0000250	0.0000250	0.0000250	0.00913	0.100	0.05	0.1
	August	0.0000361	0.0000361	0.0000361	0.0377	0.592	0.05	0.1
	September	0.0000250	0.0000250	0.0000250	0.0108	0.129	0.05	0.1
	October	0.0000250	0.0000250	0.0000250	0.0102	0.119	0.05	0.1
	November	0.0000250	0.0000250	0.0000250	0.0103	0.120	0.05	0.1
	December	0.0000250	0.0000250	0.0000250	0.0102	0.118	0.05	0.1
Operations (2018-2042)	January	0.0000487	0.0000488	0.0000500	0.0104	0.122	0.05	0.1
	February	0.0000316	0.0000317	0.0000328	0.0107	0.127	0.05	0.1
	March	0.0000258	0.0000259	0.0000268	0.0109	0.130	0.05	0.1
	April	0.0000987	0.0000987	0.0000991	0.00933	0.104	0.05	0.1
	May	0.000300	0.000300	0.000300	0.00652	0.0553	0.05	0.1
	June	0.0000875	0.0000875	0.0000877	0.00724	0.0677	0.05	0.1
	July	0.0000252	0.0000252	0.0000254	0.00913	0.100	0.05	0.1
	August	0.0000364	0.0000364	0.0000365	0.0377	0.592	0.05	0.1
	September	0.0000259	0.0000260	0.0000270	0.0108	0.129	0.05	0.1
	October	0.0000255	0.0000256	0.0000261	0.0102	0.119	0.05	0.1
	November	0.0000256	0.0000256	0.0000262	0.0103	0.120	0.05	0.1
	December	0.0000257	0.0000258	0.0000265	0.0102	0.118	0.05	0.1
Closure (2043-2060)	January	0.000055	0.000055	0.000055	0.0104	0.122	0.05	0.1
	February	0.000036	0.000036	0.000036	0.0107	0.127	0.05	0.1
	March	0.000029	0.000029	0.000029	0.0109	0.130	0.05	0.1
	April	0.000101	0.000101	0.000101	0.00933	0.104	0.05	0.1
	May	0.0002973	0.0002973	0.0002973	0.00652	0.0553	0.05	0.1
	June	0.0000873	0.0000873	0.0000873	0.00724	0.0677	0.05	0.1
	July	0.0000259	0.0000259	0.0000259	0.00913	0.100	0.05	0.1
	August	0.0000367	0.0000367	0.0000367	0.0377	0.592	0.05	0.1
	September	0.0000282	0.0000282	0.0000282	0.0108	0.129	0.05	0.1
	October	0.0000275	0.0000275	0.0000275	0.0102	0.119	0.05	0.1
	November	0.0000275	0.0000275	0.0000275	0.0103	0.120	0.05	0.1
	December	0.0000279	0.0000279	0.0000279	0.0102	0.118	0.05	0.1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G61. M19 Creek Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.00471	0.000403	0.000979	0.000488
	February	0.00290	0.000244	0.000620	0.000310
	March	0.00230	0.000192	0.000500	0.000250
	April	0.0106	0.000959	0.00199	0.000993
	May	0.0458	0.00541	0.00598	0.00299
	June	0.0120	0.00129	0.00174	0.000871
	July	0.00274	0.000250	0.000500	0.000250
	August	0.000958	0.000061	0.000723	0.000361
	September	0.00231	0.000194	0.000500	0.000250
	October	0.00244	0.000210	0.000500	0.000250
	November	0.00243	0.000208	0.000500	0.000250
	December	0.00246	0.000212	0.000500	0.000250
Operations (2018-2042)	January	0.00471	0.000411	0.00100	0.000488
	February	0.00296	0.000258	0.000656	0.000317
	March	0.00238	0.000206	0.000536	0.000259
	April	0.0106	0.000956	0.00198	0.000987
	May	0.0460	0.00543	0.00600	0.00300
	June	0.0121	0.00130	0.00175	0.000875
	July	0.00276	0.000254	0.000508	0.000252
	August	0.000964	0.0000617	0.000731	0.000364
	September	0.00240	0.000209	0.000540	0.000260
	October	0.00250	0.000219	0.000523	0.000256
	November	0.00249	0.000219	0.000525	0.000256
	December	0.00254	0.000225	0.000530	0.000258
Closure (2043-2060)	January	0.00530	0.000454	0.00110	0.000550
	February	0.00339	0.000286	0.000725	0.000362
	March	0.00269	0.000225	0.000585	0.000293
	April	0.0108	0.000973	0.00202	0.00101
	May	0.0456	0.00538	0.00595	0.00297
	June	0.0120	0.00129	0.00175	0.000873
	July	0.00284	0.000259	0.000518	0.000259
	August	0.000974	0.0000621	0.000735	0.000367
	September	0.00261	0.000218	0.000564	0.000282
	October	0.00269	0.000231	0.000550	0.000275
	November	0.00268	0.000230	0.000551	0.000275
	December	0.00275	0.000237	0.000559	0.000279

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are hardness dependent*

Appendix 8-G6m. M19 Creek Hazard Quotients for Total Lithium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Lithium Concentration			BC MOE Working Final Chronic Value Guideline	BC MOE Working Maximum Guideline	Maximum Predicted vs. BC MOE Working Final Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00368	0.00367	0.00368	0.096	0.87	0.0383	0.00423
	February	0.00368	0.00367	0.00368	0.096	0.87	0.0383	0.00423
	March	0.00391	0.00391	0.00392	0.096	0.87	0.0408	0.00450
	April	0.00358	0.00358	0.00359	0.096	0.87	0.0374	0.00412
	May	0.00280	0.00280	0.00280	0.096	0.87	0.0292	0.00322
	June	0.00277	0.00277	0.00277	0.096	0.87	0.0289	0.00319
	July	0.00354	0.00354	0.00354	0.096	0.87	0.0369	0.00407
	August	0.0266	0.0266	0.0266	0.096	0.87	0.277	0.0305
	September	0.00432	0.00432	0.00433	0.096	0.87	0.0451	0.00497
	October	0.00406	0.00406	0.00407	0.096	0.87	0.0424	0.00468
	November	0.00361	0.00361	0.00362	0.096	0.87	0.0377	0.00416
	December	0.00367	0.00367	0.00368	0.096	0.87	0.0383	0.00423
Operations (2018-2042)	January	0.00376	0.00377	0.00391	0.096	0.87	0.0407	0.00450
	February	0.00375	0.00375	0.00388	0.096	0.87	0.0404	0.00446
	March	0.00396	0.00396	0.00407	0.096	0.87	0.0424	0.00467
	April	0.00357	0.00357	0.00358	0.096	0.87	0.0373	0.00412
	May	0.00278	0.00278	0.00279	0.096	0.87	0.0291	0.00321
	June	0.00277	0.00277	0.00279	0.096	0.87	0.0290	0.00320
	July	0.00353	0.00353	0.00355	0.096	0.87	0.0370	0.00408
	August	0.0267	0.0267	0.0267	0.096	0.87	0.278	0.0307
	September	0.00440	0.00440	0.00452	0.096	0.87	0.0470	0.00519
	October	0.00409	0.00409	0.00415	0.096	0.87	0.0433	0.00477
	November	0.00364	0.00364	0.00371	0.096	0.87	0.0387	0.00427
	December	0.00372	0.00372	0.00381	0.096	0.87	0.0396	0.00437
Closure (2043-2060)	January	0.00418	0.00418	0.00424	0.096	0.87	0.0442	0.00487
	February	0.00424	0.00424	0.00425	0.096	0.87	0.0443	0.00489
	March	0.00444	0.00444	0.00444	0.096	0.87	0.0463	0.00511
	April	0.00366	0.00366	0.00366	0.096	0.87	0.0381	0.00421
	May	0.00288	0.00288	0.00288	0.096	0.87	0.0300	0.00331
	June	0.00288	0.00288	0.00288	0.096	0.87	0.0300	0.00331
	July	0.00369	0.00369	0.00369	0.096	0.87	0.038	0.00424
	August	0.0264	0.0264	0.0264	0.096	0.87	0.275	0.0304
	September	0.00472	0.00472	0.00472	0.096	0.87	0.0492	0.00543
	October	0.00440	0.00440	0.00440	0.096	0.87	0.0458	0.00506
	November	0.00395	0.00395	0.00395	0.096	0.87	0.0411	0.00454
	December	0.00406	0.00406	0.00406	0.096	0.87	0.0422	0.00466

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6n. M19 Creek Hazard Quotients for Total Manganese, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Manganese Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00264	0.00263	0.00264	1.43	2.60	0.00184	0.00101
	February	0.000968	0.000966	0.000969	1.46	2.67	0.000663	0.000363
	March	0.000992	0.000991	0.000993	1.47	2.71	0.000673	0.000366
	April	0.0103	0.0103	0.0103	1.33	2.36	0.00771	0.00435
	May	0.0134	0.0134	0.0134	1.05	1.65	0.0128	0.00814
	June	0.00480	0.00480	0.00480	1.12	1.84	0.00427	0.00261
	July	0.00249	0.00249	0.00249	1.31	2.31	0.00190	0.00108
	August	0.00143	0.00143	0.00143	3.46	7.68	0.000415	0.000187
	September	0.00139	0.00139	0.00139	1.47	2.70	0.000947	0.000515
	October	0.00103	0.00103	0.00103	1.41	2.57	0.000729	0.000403
	November	0.000713	0.000713	0.000713	1.42	2.58	0.000502	0.000277
	December	0.000734	0.000734	0.000736	1.41	2.55	0.000521	0.000288
Operations (2018-2042)	January	0.00257	0.00256	0.00260	1.43	2.60	0.00179	0.00100
	February	0.000964	0.000962	0.00098	1.46	2.67	0.000660	0.000367
	March	0.00100	0.00100	0.00101	1.47	2.71	0.000676	0.000373
	April	0.0102	0.0102	0.0102	1.33	2.36	0.00765	0.00434
	May	0.0134	0.0134	0.0134	1.05	1.65	0.0128	0.00815
	June	0.00481	0.00481	0.00481	1.12	1.84	0.00427	0.00261
	July	0.00250	0.00250	0.00250	1.31	2.31	0.00190	0.00108
	August	0.00144	0.00144	0.00144	3.46	7.68	0.000415	0.000187
	September	0.00141	0.00141	0.00143	1.47	2.70	0.000963	0.000531
	October	0.00104	0.00104	0.00105	1.41	2.57	0.000732	0.000407
	November	0.000723	0.000724	0.000736	1.42	2.58	0.000510	0.000285
	December	0.000746	0.000747	0.000761	1.41	2.55	0.000531	0.000298
Closure (2043-2060)	January	0.00290	0.00290	0.00290	1.43	2.60	0.00203	0.00111
	February	0.00113	0.00113	0.00113	1.46	2.67	0.000778	0.000424
	March	0.00112	0.00112	0.00112	1.47	2.71	0.000764	0.000415
	April	0.0104	0.0104	0.0104	1.33	2.36	0.00783	0.00442
	May	0.0134	0.0134	0.0134	1.05	1.65	0.01280	0.00813
	June	0.00481	0.00481	0.00481	1.12	1.84	0.00428	0.00261
	July	0.00252	0.00252	0.00252	1.31	2.31	0.00192	0.00109
	August	0.00146	0.00146	0.00146	3.46	7.68	0.000421	0.000190
	September	0.00147	0.00147	0.00147	1.47	2.70	0.001000	0.000543
	October	0.00111	0.00111	0.00111	1.41	2.57	0.000787	0.000434
	November	0.000781	0.000781	0.000781	1.42	2.58	0.000550	0.000303
	December	0.000817	0.000817	0.000817	1.41	2.55	0.000580	0.000320

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G60. M19 Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	BC DWQG	BC MOE 30-Day Mean if MeHg is 0.5% of THg
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	February	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	March	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	May	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	June	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	July	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	October	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	November	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	December	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
Operations (2018-2042)	January	0.0000521	0.0000519	0.000054	0.00002	0.001	0.00002
	February	0.000052	0.000052	0.000053	0.00002	0.001	0.00002
	March	0.0000515	0.0000514	0.0000526	0.00002	0.001	0.00002
	April	0.0000502	0.0000501	0.0000503	0.00002	0.001	0.00002
	May	0.0000502	0.0000501	0.0000503	0.00002	0.001	0.00002
	June	0.0000503	0.0000503	0.0000505	0.00002	0.001	0.00002
	July	0.0000504	0.0000503	0.0000506	0.00002	0.001	0.00002
	August	0.0000503	0.0000503	0.0000505	0.00002	0.001	0.00002
	September	0.0000518	0.0000516	0.000053	0.00002	0.001	0.00002
	October	0.0000510	0.0000509	0.0000516	0.00002	0.001	0.00002
	November	0.0000511	0.0000510	0.0000517	0.00002	0.001	0.00002
	December	0.0000514	0.0000512	0.0000521	0.00002	0.001	0.00002
Closure (2043-2060)	January	0.0000547	0.0000547	0.0000548	0.00002	0.001	0.00002
	February	0.000055	0.000055	0.000055	0.00002	0.001	0.00002
	March	0.0000548	0.0000548	0.0000548	0.00002	0.001	0.00002
	April	0.0000504	0.0000504	0.0000504	0.00002	0.001	0.00002
	May	0.0000504	0.0000504	0.0000504	0.00002	0.001	0.00002
	June	0.0000508	0.0000508	0.0000508	0.00002	0.001	0.00002
	July	0.0000510	0.0000510	0.0000510	0.00002	0.001	0.00002
	August	0.0000508	0.0000508	0.0000508	0.00002	0.001	0.00002
	September	0.0000536	0.0000536	0.0000536	0.00002	0.001	0.00002
	October	0.0000528	0.0000528	0.0000528	0.00002	0.001	0.00002
	November	0.0000528	0.0000528	0.0000528	0.00002	0.001	0.00002
	December	0.0000533	0.0000533	0.0000533	0.00002	0.001	0.00002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6o. M19 Creek Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg
Construction (2015-2017)	January	0.250	0.00500	0.250
	February	0.25	0.0050	0.25
	March	0.250	0.00500	0.250
	April	0.250	0.00500	0.250
	May	0.250	0.00500	0.250
	June	0.250	0.00500	0.250
	July	0.250	0.00500	0.250
	August	0.250	0.00500	0.250
	September	0.250	0.00500	0.250
	October	0.250	0.00500	0.250
	November	0.250	0.00500	0.250
	December	0.250	0.00500	0.250
Operations (2018-2042)	January	0.259	0.00535	0.259
	February	0.26	0.0053	0.26
	March	0.257	0.00526	0.257
	April	0.251	0.00503	0.251
	May	0.251	0.00503	0.251
	June	0.251	0.00505	0.251
	July	0.252	0.00506	0.252
	August	0.251	0.00505	0.251
	September	0.258	0.00528	0.258
	October	0.254	0.00516	0.254
	November	0.255	0.00517	0.255
	December	0.256	0.00521	0.256
Closure (2043-2060)	January	0.274	0.00548	0.274
	February	0.28	0.0055	0.28
	March	0.274	0.00548	0.274
	April	0.252	0.00504	0.252
	May	0.252	0.00504	0.252
	June	0.254	0.00508	0.254
	July	0.255	0.00510	0.255
	August	0.254	0.00508	0.254
	September	0.268	0.00536	0.268
	October	0.264	0.00528	0.264
	November	0.264	0.00528	0.264
	December	0.267	0.00533	0.267

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6p. M19 Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000277	0.000277	0.000277	1	2	0.25	0.05
	February	0.000263	0.000262	0.000263	1	2	0.25	0.05
	March	0.000305	0.000305	0.000305	1	2	0.25	0.05
	April	0.000199	0.000199	0.000199	1	2	0.25	0.05
	May	0.000177	0.000177	0.000177	1	2	0.25	0.05
	June	0.000157	0.000157	0.000157	1	2	0.25	0.05
	July	0.000222	0.000222	0.000222	1	2	0.25	0.05
	August	0.000449	0.000449	0.000450	1	2	0.25	0.05
	September	0.000276	0.000276	0.000276	1	2	0.25	0.05
	October	0.000288	0.000288	0.000288	1	2	0.25	0.05
	November	0.000291	0.000291	0.000291	1	2	0.25	0.05
	December	0.000286	0.000286	0.000286	1	2	0.25	0.05
Operations (2018-2042)	January	0.000349	0.000354	0.000449	1	2	0.25	0.05
	February	0.000326	0.000330	0.000413	1	2	0.25	0.05
	March	0.000358	0.000361	0.000431	1	2	0.25	0.05
	April	0.000204	0.000204	0.000211	1	2	0.25	0.05
	May	0.000182	0.000183	0.000190	1	2	0.25	0.05
	June	0.000166	0.000167	0.000180	1	2	0.25	0.05
	July	0.000235	0.000235	0.000251	1	2	0.25	0.05
	August	0.000461	0.000461	0.000474	1	2	0.25	0.05
	September	0.000339	0.000342	0.000417	1	2	0.25	0.05
	October	0.000324	0.000326	0.000368	1	2	0.25	0.05
	November	0.000330	0.000332	0.000378	1	2	0.25	0.05
	December	0.000334	0.000337	0.000393	1	2	0.25	0.05
Closure (2043-2060)	January	0.000417	0.000421	0.000499	1	2	0.25	0.05
	February	0.000421	0.000422	0.000442	1	2	0.25	0.05
	March	0.000447	0.000447	0.000451	1	2	0.25	0.05
	April	0.000213	0.000213	0.000213	1	2	0.25	0.05
	May	0.000191	0.000191	0.000191	1	2	0.25	0.05
	June	0.000182	0.000182	0.000182	1	2	0.25	0.05
	July	0.000252	0.000252	0.000252	1	2	0.25	0.05
	August	0.000472	0.000472	0.000472	1	2	0.25	0.05
	September	0.000383	0.000383	0.000383	1	2	0.25	0.05
	October	0.000372	0.000372	0.000372	1	2	0.25	0.05
	November	0.000376	0.000376	0.000376	1	2	0.25	0.05
	December	0.000384	0.000384	0.000384	1	2	0.25	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6p. M19 Creek Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.000277	0.000139	0.00111	0.00554
	February	0.000262	0.000131	0.00105	0.00525
	March	0.000305	0.000152	0.00122	0.00609
	April	0.000199	0.0000995	0.000796	0.00398
	May	0.000177	0.0000887	0.000710	0.00355
	June	0.000157	0.0000783	0.000627	0.00313
	July	0.000222	0.000111	0.000887	0.00443
	August	0.000449	0.000225	0.00180	0.00899
	September	0.000276	0.000138	0.00110	0.00552
	October	0.000288	0.000144	0.00115	0.00575
	November	0.000291	0.000146	0.00116	0.00582
	December	0.000286	0.000143	0.00114	0.00572
Operations (2018-2042)	January	0.000354	0.000225	0.00180	0.00898
	February	0.000330	0.000206	0.00165	0.00826
	March	0.000361	0.000215	0.00172	0.00861
	April	0.000204	0.000106	0.000844	0.00422
	May	0.000183	0.0000949	0.000759	0.00380
	June	0.000167	0.0000899	0.000719	0.00360
	July	0.000235	0.000126	0.00101	0.00503
	August	0.000461	0.000237	0.00190	0.00949
	September	0.000342	0.000209	0.00167	0.00835
	October	0.000326	0.000184	0.00147	0.00736
	November	0.000332	0.000189	0.00151	0.00756
	December	0.000337	0.000196	0.00157	0.00785
Closure (2043-2060)	January	0.000421	0.000250	0.00200	0.0100
	February	0.000422	0.000221	0.00177	0.0088
	March	0.000447	0.000226	0.00181	0.0090
	April	0.000213	0.000107	0.000853	0.0043
	May	0.000191	0.0000957	0.000766	0.0038
	June	0.000182	0.0000908	0.000726	0.0036
	July	0.000252	0.000126	0.00101	0.0050
	August	0.000472	0.000236	0.00189	0.0094
	September	0.000383	0.000191	0.00153	0.0077
	October	0.000372	0.000186	0.00149	0.0074
	November	0.000376	0.000188	0.00150	0.0075
	December	0.000384	0.000192	0.00153	0.0077

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6q. M19 Creek Hazard Quotients for Total Nickel, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹	Hazard Quotient relative to Aquatic Life Guideline
		Total Nickel Concentration			BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.000685	0.000685	0.000685	0.15	0.00457
	February	0.000726	0.000726	0.000726	0.15	0.00484
	March	0.000687	0.000687	0.000687	0.15	0.00458
	April	0.000807	0.000807	0.000808	0.11	0.00734
	May	0.00163	0.00163	0.00163	0.065	0.0251
	June	0.00101	0.00101	0.00101	0.065	0.0156
	July	0.000918	0.000918	0.000918	0.11	0.00834
	August	0.00328	0.00328	0.00328	0.15	0.0219
	September	0.00106	0.00106	0.00106	0.15	0.00710
	October	0.000775	0.000775	0.000775	0.15	0.00517
	November	0.000735	0.000735	0.000736	0.15	0.00491
	December	0.000734	0.000734	0.000735	0.15	0.00490
Operations (2018-2042)	January	0.000714	0.000718	0.000760	0.15	0.00507
	February	0.000749	0.000752	0.000789	0.15	0.00526
	March	0.000708	0.000710	0.000741	0.15	0.00494
	April	0.000808	0.000808	0.000811	0.11	0.00737
	May	0.00164	0.00164	0.00164	0.065	0.0253
	June	0.00102	0.00102	0.00102	0.065	0.0158
	July	0.000924	0.000924	0.000932	0.11	0.00847
	August	0.00330	0.00330	0.00330	0.15	0.0220
	September	0.00109	0.00109	0.00113	0.15	0.00751
	October	0.000789	0.000791	0.000809	0.15	0.00540
	November	0.000748	0.000750	0.000770	0.15	0.00513
	December	0.000751	0.000753	0.000777	0.15	0.00518
Closure (2043-2060)	January	0.000767	0.000769	0.000797	0.15	0.00531
	February	0.000821	0.000821	0.000828	0.15	0.00552
	March	0.000769	0.000769	0.000771	0.15	0.00514
	April	0.000818	0.000818	0.000818	0.11	0.00744
	May	0.00163	0.00163	0.00163	0.065	0.0251
	June	0.00102	0.00102	0.00102	0.065	0.0157
	July	0.000934	0.000934	0.000934	0.11	0.00849
	August	0.00327	0.00327	0.00327	0.15	0.0218
	September	0.00113	0.00113	0.00113	0.15	0.00751
	October	0.000825	0.000825	0.000825	0.15	0.00550
	November	0.000790	0.000790	0.000790	0.15	0.00527
	December	0.000797	0.000797	0.000797	0.15	0.00531

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G6r. M19 Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Selenium Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Maximum
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000210	0.000210	0.000210	0.002	0.01	0.002
	February	0.000324	0.000324	0.000324	0.002	0.01	0.002
	March	0.000307	0.000306	0.000307	0.002	0.01	0.002
	April	0.000227	0.000226	0.000227	0.002	0.01	0.002
	May	0.000189	0.000189	0.000189	0.002	0.01	0.002
	June	0.000178	0.000177	0.000178	0.002	0.01	0.002
	July	0.000199	0.000199	0.000199	0.002	0.01	0.002
	August	0.00239	0.00239	0.00239	0.002	0.01	0.002
	September	0.000230	0.000229	0.000230	0.002	0.01	0.002
	October	0.000195	0.000195	0.000195	0.002	0.01	0.002
	November	0.000223	0.000223	0.000223	0.002	0.01	0.002
	December	0.000229	0.000229	0.000230	0.002	0.01	0.002
Operations (2018-2042)	January	0.000277	0.000277	0.000350	0.002	0.01	0.002
	February	0.000380	0.000381	0.000444	0.002	0.01	0.002
	March	0.000355	0.000355	0.000408	0.002	0.01	0.002
	April	0.000230	0.000230	0.000236	0.002	0.01	0.002
	May	0.000193	0.000194	0.000199	0.002	0.01	0.002
	June	0.000186	0.000186	0.000196	0.002	0.01	0.002
	July	0.000209	0.000209	0.000221	0.002	0.01	0.002
	August	0.00241	0.00241	0.00242	0.002	0.01	0.002
	September	0.000286	0.000287	0.000344	0.002	0.01	0.002
	October	0.000227	0.000228	0.000260	0.002	0.01	0.002
	November	0.000257	0.000258	0.000292	0.002	0.01	0.002
	December	0.000272	0.000273	0.000315	0.002	0.01	0.002
Closure (2043-2060)	January	0.000426	0.000428	0.000458	0.002	0.01	0.002
	February	0.000572	0.000573	0.000580	0.002	0.01	0.002
	March	0.000527	0.000527	0.000529	0.002	0.01	0.002
	April	0.000249	0.000249	0.000249	0.002	0.01	0.002
	May	0.000211	0.000211	0.000211	0.002	0.01	0.002
	June	0.000217	0.000217	0.000217	0.002	0.01	0.002
	July	0.000248	0.000248	0.000248	0.002	0.01	0.002
	August	0.00240	0.00240	0.00240	0.002	0.01	0.002
	September	0.000396	0.000396	0.000396	0.002	0.01	0.002
	October	0.000327	0.000327	0.000327	0.002	0.01	0.002
	November	0.000356	0.000356	0.000356	0.002	0.01	0.002
	December	0.000383	0.000383	0.000383	0.002	0.01	0.002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6r. M19 Creek Hazard Quotients for Total Selenium, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.105	0.0210	0.105
	February	0.162	0.0324	0.162
	March	0.153	0.0307	0.153
	April	0.113	0.0227	0.113
	May	0.0946	0.0189	0.0947
	June	0.0887	0.0178	0.0889
	July	0.0993	0.0199	0.0994
	August	1.19	0.239	1.19
	September	0.115	0.0230	0.115
	October	0.0976	0.0195	0.0977
	November	0.111	0.0223	0.112
	December	0.115	0.0230	0.115
Operations (2018-2042)	January	0.139	0.0350	0.175
	February	0.190	0.0444	0.222
	March	0.178	0.0408	0.204
	April	0.115	0.0236	0.118
	May	0.0968	0.0199	0.0994
	June	0.0930	0.0196	0.0978
	July	0.105	0.0221	0.111
	August	1.20	0.242	1.21
	September	0.143	0.0344	0.172
	October	0.114	0.0260	0.130
	November	0.129	0.0292	0.146
	December	0.136	0.0315	0.158
Closure (2043-2060)	January	0.214	0.0458	0.229
	February	0.286	0.0580	0.290
	March	0.263	0.0529	0.264
	April	0.125	0.0249	0.125
	May	0.106	0.0211	0.106
	June	0.108	0.0217	0.108
	July	0.124	0.0248	0.124
	August	1.20	0.240	1.20
	September	0.198	0.0396	0.198
	October	0.163	0.0327	0.163
	November	0.178	0.0356	0.178
	December	0.192	0.0383	0.192

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6s. M19 Creek Hazard Quotients for Total Silver, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Silver Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	February	0.0000555	0.0000555	0.0000555	0.0015	0.003	0.00370	0.00185
	March	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	April	0.0000610	0.0000610	0.0000611	0.0015	0.003	0.00407	0.00204
	May	0.0000856	0.0000856	0.0000856	0.0015	0.003	0.00571	0.00285
	June	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	July	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	August	0.0000722	0.0000723	0.0000723	0.0015	0.003	0.00482	0.00241
	September	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	October	0.0000130	0.0000130	0.0000130	0.0015	0.003	0.00868	0.00434
	November	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
	December	0.0000500	0.0000500	0.0000500	0.0015	0.003	0.00333	0.00167
Operations (2018-2042)	January	0.0000506	0.0000506	0.0000513	0.0015	0.003	0.00337	0.00171
	February	0.0000558	0.0000558	0.0000564	0.0015	0.003	0.00372	0.00188
	March	0.0000505	0.0000505	0.0000510	0.0015	0.003	0.00336	0.00170
	April	0.0000605	0.0000605	0.0000608	0.0015	0.003	0.00404	0.00203
	May	0.0000859	0.0000858	0.0000859	0.0015	0.003	0.00572	0.00286
	June	0.0000501	0.0000501	0.0000502	0.0015	0.003	0.00334	0.00167
	July	0.0000501	0.0000501	0.0000502	0.0015	0.003	0.00334	0.00167
	August	0.0000725	0.0000725	0.0000726	0.0015	0.003	0.00483	0.00242
	September	0.0000505	0.0000505	0.0000511	0.0015	0.003	0.00337	0.00170
	October	0.0000131	0.0000131	0.0000131	0.0015	0.003	0.00872	0.00437
	November	0.0000503	0.0000503	0.0000507	0.0015	0.003	0.00336	0.00169
	December	0.0000504	0.0000504	0.0000508	0.0015	0.003	0.00336	0.00169
Closure (2043-2060)	January	0.0000528	0.0000528	0.0000528	0.0015	0.003	0.00352	0.00176
	February	0.0000592	0.0000592	0.0000592	0.0015	0.003	0.00394	0.00197
	March	0.0000529	0.0000529	0.0000529	0.0015	0.003	0.00352	0.00176
	April	0.0000622	0.0000622	0.0000622	0.0015	0.003	0.00415	0.00207
	May	0.0000855	0.0000855	0.0000855	0.0015	0.003	0.00570	0.00285
	June	0.0000505	0.0000505	0.0000505	0.0015	0.003	0.00336	0.00168
	July	0.0000506	0.0000506	0.0000506	0.0015	0.003	0.00337	0.00169
	August	0.0000725	0.0000725	0.0000725	0.0015	0.003	0.00483	0.00242
	September	0.0000521	0.0000521	0.0000521	0.0015	0.003	0.00348	0.00174
	October	0.0000131	0.0000131	0.0000131	0.0015	0.003	0.00873	0.00436
	November	0.0000517	0.0000517	0.0000517	0.0015	0.003	0.00345	0.00172
	December	0.0000520	0.0000520	0.0000520	0.0015	0.003	0.00346	0.00173

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6t. M19 Creek Hazard Quotients for Total Thallium, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Thallium Concentration			BC MOE Working Guideline	BC DWQG	Mean Predicted vs. BC MOE Working 30-Day Mean Guideline	Maximum predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	February	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	March	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	April	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	May	0.0000116	0.0000116	0.0000116	0.0003	0.002	0.0387	0.00581
	June	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	July	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	August	0.0000722	0.0000723	0.0000723	0.0003	0.002	0.0241	0.00361
	September	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	October	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	November	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	December	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
Operations (2018-2042)	January	0.0000507	0.0000508	0.0000516	0.0003	0.002	0.0169	0.00258
	February	0.0000506	0.0000507	0.0000514	0.0003	0.002	0.0169	0.00257
	March	0.0000505	0.0000506	0.0000511	0.0003	0.002	0.0169	0.00256
	April	0.0000500	0.0000501	0.0000501	0.0003	0.002	0.0167	0.00251
	May	0.0000116	0.0000116	0.0000116	0.0003	0.002	0.0388	0.00582
	June	0.0000501	0.0000501	0.0000502	0.0003	0.002	0.0167	0.00251
	July	0.0000501	0.0000501	0.0000503	0.0003	0.002	0.0167	0.00251
	August	0.0000725	0.0000725	0.0000726	0.0003	0.002	0.0242	0.00363
	September	0.0000506	0.0000507	0.0000513	0.0003	0.002	0.0169	0.00256
	October	0.0000503	0.0000504	0.0000507	0.0003	0.002	0.0168	0.00254
	November	0.0000503	0.0000504	0.0000508	0.0003	0.002	0.0168	0.00254
	December	0.0000504	0.0000505	0.0000510	0.0003	0.002	0.0168	0.00255
Closure (2043-2060)	January	0.0000538	0.0000538	0.0000538	0.0003	0.002	0.0179	0.00269
	February	0.0000543	0.0000543	0.0000543	0.0003	0.002	0.0181	0.00271
	March	0.0000538	0.0000538	0.0000538	0.0003	0.002	0.0179	0.00269
	April	0.0000503	0.0000503	0.0000503	0.0003	0.002	0.0168	0.00252
	May	0.0000116	0.0000116	0.0000116	0.0003	0.002	0.0387	0.00581
	June	0.0000506	0.0000506	0.0000506	0.0003	0.002	0.0169	0.00253
	July	0.0000508	0.0000508	0.0000508	0.0003	0.002	0.0169	0.00254
	August	0.0000727	0.0000727	0.0000727	0.0003	0.002	0.0242	0.00363
	September	0.0000529	0.0000529	0.0000529	0.0003	0.002	0.0176	0.00264
	October	0.0000523	0.0000523	0.0000523	0.0003	0.002	0.0174	0.00261
	November	0.0000523	0.0000523	0.0000523	0.0003	0.002	0.0174	0.00261
	December	0.0000526	0.0000526	0.0000526	0.0003	0.002	0.0175	0.00263

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6u. M19 Creek Hazard Quotients for Total Uranium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Uranium Concentration			BC MOE Working Guideline	Canadian DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. Canadian DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000409	0.000408	0.000409	0.3	0.02	0.00136	0.0204
	February	0.000500	0.000499	0.000500	0.3	0.02	0.00167	0.0250
	March	0.000536	0.000536	0.000537	0.3	0.02	0.00179	0.0268
	April	0.000233	0.000232	0.000233	0.3	0.02	0.000776	0.0116
	May	0.000141	0.000141	0.000141	0.3	0.02	0.000471	0.00706
	June	0.000122	0.000122	0.000122	0.3	0.02	0.000407	0.00611
	July	0.000221	0.000221	0.000221	0.3	0.02	0.000738	0.0111
	August	0.00351	0.00351	0.00351	0.3	0.02	0.0117	0.175
	September	0.000375	0.000375	0.000377	0.3	0.02	0.00126	0.0188
	October	0.000372	0.000371	0.000373	0.3	0.02	0.00124	0.0186
	November	0.000474	0.000474	0.000476	0.3	0.02	0.00159	0.0238
	December	0.000476	0.000476	0.000478	0.3	0.02	0.00159	0.0239
Operations (2018-2042)	January	0.000411	0.000411	0.000419	0.3	0.02	0.00140	0.0209
	February	0.000499	0.000499	0.000505	0.3	0.02	0.00168	0.0253
	March	0.000534	0.000534	0.000539	0.3	0.02	0.00180	0.0270
	April	0.000231	0.000231	0.000232	0.3	0.02	0.000772	0.0116
	May	0.000138	0.000138	0.000140	0.3	0.02	0.000466	0.00699
	June	0.000121	0.000121	0.000121	0.3	0.02	0.000405	0.00607
	July	0.000219	0.000219	0.000220	0.3	0.02	0.000734	0.0110
	August	0.00352	0.00352	0.00352	0.3	0.02	0.0117	0.176
	September	0.000376	0.000376	0.000382	0.3	0.02	0.00127	0.0191
	October	0.000371	0.000371	0.000374	0.3	0.02	0.00125	0.0187
	November	0.000472	0.000472	0.000475	0.3	0.02	0.00158	0.0238
	December	0.000475	0.000475	0.000479	0.3	0.02	0.00160	0.0239
Closure (2043-2060)	January	0.000432	0.000433	0.000439	0.3	0.02	0.00146	0.0220
	February	0.000529	0.000529	0.000531	0.3	0.02	0.00177	0.0266
	March	0.000565	0.000565	0.000565	0.3	0.02	0.00188	0.0282
	April	0.000238	0.000238	0.000238	0.3	0.02	0.000793	0.0119
	May	0.000148	0.000148	0.000148	0.3	0.02	0.000492	0.00738
	June	0.000129	0.000129	0.000129	0.3	0.02	0.000429	0.00644
	July	0.000230	0.000230	0.000230	0.3	0.02	0.000766	0.0115
	August	0.00348	0.00348	0.00348	0.3	0.02	0.0116	0.174
	September	0.000398	0.000398	0.000398	0.3	0.02	0.00133	0.0199
	October	0.000390	0.000390	0.000390	0.3	0.02	0.00130	0.0195
	November	0.000496	0.000496	0.000496	0.3	0.02	0.00165	0.0248
	December	0.000501	0.000501	0.000501	0.3	0.02	0.00167	0.0251

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6v. M19 Creek Hazard Quotients for Total Vanadium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Vanadium Concentration			BC MOE Working Guideline	BC MOE Working Secondary Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Secondary Chronic Value Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	February	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	March	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	April	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	May	0.00133	0.00133	0.00133	0.006	0.02	0.222	0.0667
	June	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	July	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	August	0.000722	0.000723	0.000723	0.006	0.02	0.120	0.0361
	September	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	October	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	November	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	December	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
Operations (2018-2042)	January	0.000510	0.000509	0.000519	0.006	0.02	0.0865	0.0260
	February	0.000509	0.000508	0.000517	0.006	0.02	0.0861	0.0258
	March	0.000507	0.000507	0.000514	0.006	0.02	0.0857	0.0257
	April	0.000501	0.000501	0.000501	0.006	0.02	0.0836	0.0251
	May	0.00134	0.00134	0.00134	0.006	0.02	0.223	0.0669
	June	0.000501	0.000501	0.000503	0.006	0.02	0.0838	0.0251
	July	0.000502	0.000502	0.000503	0.006	0.02	0.0839	0.0252
	August	0.000725	0.000725	0.000727	0.006	0.02	0.121	0.0363
	September	0.000508	0.000508	0.000516	0.006	0.02	0.0860	0.0258
	October	0.000505	0.000505	0.000509	0.006	0.02	0.0848	0.0254
	November	0.000505	0.000505	0.000510	0.006	0.02	0.0850	0.0255
	December	0.000506	0.000506	0.000512	0.006	0.02	0.0853	0.0256
Closure (2043-2060)	January	0.000515	0.000516	0.00053	0.006	0.02	0.0875	0.0263
	February	0.000517	0.000517	0.00052	0.006	0.02	0.0866	0.0260
	March	0.000515	0.000516	0.00052	0.006	0.02	0.0860	0.0258
	April	0.000501	0.000501	0.000501	0.006	0.02	0.0836	0.0251
	May	0.00133	0.00133	0.00133	0.006	0.02	0.222	0.0665
	June	0.000503	0.000503	0.000503	0.006	0.02	0.0838	0.0251
	July	0.000503	0.000503	0.000503	0.006	0.02	0.0839	0.0252
	August	0.000723	0.000723	0.000723	0.006	0.02	0.120	0.0361
	September	0.000512	0.000512	0.000512	0.006	0.02	0.0853	0.0256
	October	0.000509	0.000509	0.000509	0.006	0.02	0.0849	0.0255
	November	0.000509	0.000509	0.000509	0.006	0.02	0.0849	0.0255
	December	0.000511	0.000511	0.000511	0.006	0.02	0.0851	0.0255

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6w. M19 Creek Hazard Quotients for Total Zinc, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Zinc Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00150	0.00150	0.00150	0.0803	0.106	0.0187	0.0142
	February	0.00182	0.00182	0.00182	0.0851	0.111	0.0214	0.0165
	March	0.00150	0.00150	0.00150	0.0878	0.113	0.0171	0.0132
	April	0.00171	0.00171	0.00171	0.0638	0.0893	0.0268	0.0192
	May	0.00384	0.00384	0.00384	0.0155	0.0410	0.247	0.0936
	June	0.00150	0.00150	0.00150	0.0285	0.0540	0.0526	0.0278
	July	0.00150	0.00150	0.00150	0.0604	0.0859	0.0248	0.0175
	August	0.00795	0.00795	0.00796	0.426	0.452	0.0187	0.0176
	September	0.00435	0.00435	0.00435	0.0870	0.113	0.0500	0.0387
	October	0.00170	0.00170	0.00170	0.0780	0.104	0.0218	0.0164
	November	0.00150	0.00150	0.00150	0.0788	0.104	0.0190	0.0144
	December	0.00150	0.00150	0.00150	0.0769	0.102	0.0195	0.0147
Operations (2018-2042)	January	0.00154	0.00154	0.00158	0.0803	0.106	0.0192	0.0150
	February	0.00184	0.00184	0.00187	0.0851	0.111	0.0216	0.0169
	March	0.00153	0.00153	0.00156	0.0878	0.113	0.0174	0.0138
	April	0.00170	0.00170	0.00171	0.0638	0.0893	0.0267	0.0191
	May	0.00385	0.00385	0.00385	0.0155	0.0410	0.248	0.0940
	June	0.00151	0.00151	0.00151	0.0285	0.0540	0.0528	0.0280
	July	0.00151	0.00151	0.00151	0.0604	0.0859	0.0250	0.0176
	August	0.00800	0.00799	0.00800	0.426	0.452	0.0188	0.0177
	September	0.00440	0.00440	0.00443	0.0870	0.113	0.0506	0.0394
	October	0.00171	0.00171	0.00172	0.0780	0.104	0.0219	0.0167
	November	0.00152	0.00152	0.00154	0.0788	0.104	0.0193	0.0148
	December	0.00153	0.00153	0.00155	0.0769	0.102	0.0199	0.0151
Closure (2043-2060)	January	0.00174	0.00173	0.00174	0.0803	0.106	0.0216	0.0164
	February	0.00211	0.00211	0.00211	0.0851	0.111	0.0248	0.0191
	March	0.00174	0.00174	0.00174	0.0878	0.113	0.0198	0.0154
	April	0.00175	0.00175	0.00175	0.0638	0.0893	0.0274	0.0196
	May	0.00385	0.00385	0.00385	0.0155	0.0410	0.248	0.0938
	June	0.00154	0.00154	0.00154	0.0285	0.0540	0.0540	0.0285
	July	0.00155	0.00155	0.00155	0.0604	0.0859	0.0257	0.0181
	August	0.00792	0.00792	0.00792	0.426	0.452	0.0186	0.0175
	September	0.00450	0.00450	0.00450	0.0870	0.113	0.0517	0.0400
	October	0.00186	0.00186	0.00186	0.0780	0.104	0.0238	0.0179
	November	0.00164	0.00164	0.00164	0.0788	0.104	0.0209	0.0158
	December	0.00167	0.00167	0.00167	0.0769	0.102	0.0217	0.0163

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6x. M19 Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply Maximum
		Chloride Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	
		Median	Mean	Maximum			
Construction (2015-2017)	January	5.05	5.05	5.05	150	600	600
	February	4.99	4.99	4.99	150	600	600
	March	7.97	7.97	7.98	150	600	600
	April	7.64	7.64	7.65	150	600	600
	May	2.08	2.08	2.08	150	600	600
	June	2.13	2.13	2.13	150	600	600
	July	2.11	2.11	2.11	150	600	600
	August	6.81	6.81	6.82	150	600	600
	September	1.96	1.96	1.96	150	600	600
	October	2.33	2.33	2.33	150	600	600
	November	2.53	2.53	2.53	150	600	600
	December	3.79	3.79	3.79	150	600	600
Operations (2018-2042)	January	5.10	5.10	5.13	150	600	600
	February	5.03	5.03	5.07	150	600	600
	March	8.03	8.03	8.06	150	600	600
	April	7.67	7.67	7.68	150	600	600
	May	2.09	2.09	2.09	150	600	600
	June	2.14	2.14	2.14	150	600	600
	July	2.12	2.12	2.13	150	600	600
	August	6.84	6.84	6.85	150	600	600
	September	1.98	1.98	2.01	150	600	600
	October	2.35	2.35	2.36	150	600	600
	November	2.54	2.54	2.56	150	600	600
	December	3.82	3.82	3.84	150	600	600
Closure (2043-2060)	January	5.09	5.09	5.12	150	600	600
	February	5.04	5.04	5.05	150	600	600
	March	7.98	7.98	7.98	150	600	600
	April	7.60	7.60	7.60	150	600	600
	May	2.09	2.09	2.09	150	600	600
	June	2.15	2.15	2.15	150	600	600
	July	2.12	2.12	2.12	150	600	600
	August	6.78	6.78	6.78	150	600	600
	September	2.01	2.01	2.01	150	600	600
	October	2.37	2.37	2.37	150	600	600
	November	2.57	2.57	2.57	150	600	600
	December	3.82	3.82	3.82	150	600	600

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6x. M19 Creek Hazard Quotients for Chloride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0337	0.00842	0.00842
	February	0.0333	0.00832	0.00832
	March	0.0531	0.0133	0.0133
	April	0.0510	0.0127	0.0127
	May	0.0139	0.00347	0.00347
	June	0.0142	0.00356	0.00356
	July	0.0141	0.00352	0.00352
	August	0.0454	0.0114	0.0114
	September	0.0130	0.00326	0.00326
	October	0.0155	0.00389	0.00389
	November	0.0168	0.00421	0.00421
	December	0.0253	0.00632	0.00632
Operations (2018-2042)	January	0.0340	0.00855	0.00855
	February	0.0336	0.00844	0.00844
	March	0.0535	0.0134	0.0134
	April	0.0511	0.0128	0.0128
	May	0.0139	0.00348	0.00348
	June	0.0143	0.00357	0.00357
	July	0.0142	0.00355	0.00355
	August	0.0456	0.0114	0.0114
	September	0.0132	0.00335	0.00335
	October	0.0156	0.00393	0.00393
	November	0.0170	0.00427	0.00427
	December	0.0254	0.00640	0.00640
Closure (2043-2060)	January	0.0339	0.00853	0.00853
	February	0.0336	0.00841	0.00841
	March	0.0532	0.0133	0.0133
	April	0.0507	0.0127	0.0127
	May	0.0139	0.00348	0.00348
	June	0.0143	0.00358	0.00358
	July	0.0141	0.00353	0.00353
	August	0.0452	0.0113	0.0113
	September	0.0134	0.00335	0.00335
	October	0.0158	0.00395	0.00395
	November	0.0171	0.00428	0.00428
	December	0.0255	0.00637	0.00637

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6y. M19 Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹	Drinking Water Quality Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Fluoride Concentration				BC Maximum DWQG	BC 30-Day Mean DWQG	30-Day Mean Guideline	Maximum Guideline
		Median	Mean	Maximum	BC MOE Maximum Guideline				
Construction (2015-2017)	January	0.0822	0.0822	0.0822	1.59	1.5	1	1	1.5
	February	0.0871	0.0871	0.0871	1.60	1.5	1	1	1.5
	March	0.0862	0.0862	0.0862	1.61	1.5	1	1	1.5
	April	0.0751	0.0751	0.0751	1.54	1.5	1	1	1.5
	May	0.0704	0.0704	0.0704	1.34	1.5	1	1	1.5
	June	0.0826	0.0826	0.0826	1.40	1.5	1	1	1.5
	July	0.0933	0.0932	0.0933	1.52	1.5	1	1	1.5
	August	0.161	0.161	0.161	2.09	1.5	1	1	1.5
	September	0.0858	0.0858	0.0858	1.60	1.5	1	1	1.5
	October	0.0866	0.0866	0.0867	1.58	1.5	1	1	1.5
	November	0.0831	0.0831	0.0831	1.58	1.5	1	1	1.5
	December	0.0826	0.0826	0.0827	1.58	1.5	1	1	1.5
Operations (2018-2042)	January	0.0839	0.0839	0.0859	1.59	1.5	1	1	1.5
	February	0.0887	0.0886	0.0903	1.60	1.5	1	1	1.5
	March	0.0875	0.0875	0.0889	1.61	1.5	1	1	1.5
	April	0.0752	0.0752	0.0753	1.54	1.5	1	1	1.5
	May	0.0704	0.0704	0.0705	1.34	1.5	1	1	1.5
	June	0.0828	0.0828	0.0830	1.40	1.5	1	1	1.5
	July	0.0932	0.0932	0.0935	1.52	1.5	1	1	1.5
	August	0.161	0.161	0.161	2.09	1.5	1	1	1.5
	September	0.0873	0.0873	0.0888	1.60	1.5	1	1	1.5
	October	0.0875	0.0875	0.0883	1.58	1.5	1	1	1.5
	November	0.0840	0.0840	0.0849	1.58	1.5	1	1	1.5
	December	0.0838	0.0838	0.0849	1.58	1.5	1	1	1.5
Closure (2043-2060)	January	0.0864	0.0865	0.0879	1.59	1.5	1	1	1.5
	February	0.0918	0.0918	0.0922	1.60	1.5	1	1	1.5
	March	0.0905	0.0905	0.0905	1.61	1.5	1	1	1.5
	April	0.0756	0.0756	0.0756	1.54	1.5	1	1	1.5
	May	0.0709	0.0709	0.0709	1.34	1.5	1	1	1.5
	June	0.0834	0.0834	0.0834	1.40	1.5	1	1	1.5
	July	0.0948	0.0948	0.0948	1.52	1.5	1	1	1.5
	August	0.163	0.163	0.163	2.09	1.5	1	1	1.5
	September	0.0890	0.0890	0.0890	1.60	1.5	1	1	1.5
	October	0.0892	0.0892	0.0892	1.58	1.5	1	1	1.5
	November	0.0857	0.0857	0.0857	1.58	1.5	1	1	1.5
	December	0.0857	0.0857	0.0857	1.58	1.5	1	1	1.5

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6y. M19 Creek Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC Maximum DWQG	Mean Predicted vs. BC 30-Day Mean DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0518	0.0548	0.0822	0.0822	0.0548
	February	0.0545	0.0581	0.0822	0.0871	0.0581
	March	0.0537	0.0575	0.0871	0.0862	0.0575
	April	0.0489	0.0501	0.0862	0.0751	0.0501
	May	0.0526	0.0469	0.0751	0.0704	0.0469
	June	0.0590	0.0551	0.0704	0.0826	0.0551
	July	0.0612	0.0622	0.0826	0.0932	0.0622
	August	0.0773	0.108	0.0932	0.161	0.108
	September	0.0535	0.0572	0.161	0.0858	0.0572
	October	0.0549	0.0578	0.0858	0.0866	0.0578
	November	0.0526	0.0554	0.0866	0.0831	0.0554
	December	0.0525	0.0551	0.0827	0.0826	0.0551
Operations (2018-2042)	January	0.0541	0.0572	0.0839	0.0839	0.0572
	February	0.0565	0.0602	0.0839	0.0886	0.0602
	March	0.0553	0.0593	0.0886	0.0875	0.0593
	April	0.0491	0.0502	0.0875	0.0752	0.0502
	May	0.0527	0.0470	0.0752	0.0704	0.0470
	June	0.0593	0.0553	0.0704	0.0828	0.0553
	July	0.0613	0.0623	0.0828	0.0932	0.0623
	August	0.0772	0.107	0.0932	0.161	0.107
	September	0.0553	0.0592	0.161	0.0873	0.0592
	October	0.0559	0.0589	0.0873	0.0875	0.0589
	November	0.0537	0.0566	0.0875	0.0840	0.0566
	December	0.0539	0.0566	0.0849	0.0838	0.0566
Closure (2043-2060)	January	0.0555	0.0586	0.0865	0.0865	0.0586
	February	0.0576	0.0615	0.0865	0.0918	0.0615
	March	0.0564	0.0604	0.0918	0.0905	0.0604
	April	0.0492	0.0504	0.0905	0.0756	0.0504
	May	0.0531	0.0473	0.0756	0.0709	0.0473
	June	0.0596	0.0556	0.0709	0.0834	0.0556
	July	0.0622	0.0632	0.0834	0.0948	0.0632
	August	0.0783	0.109	0.0948	0.163	0.109
	September	0.0555	0.0593	0.163	0.0890	0.0593
	October	0.0565	0.0595	0.0890	0.0892	0.0595
	November	0.0542	0.0571	0.0892	0.0857	0.0571
	December	0.0544	0.0571	0.0857	0.0857	0.0571

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G6z. M19 Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Nitrate Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.145	0.145	0.145	3	32.8	10
	February	0.203	0.203	0.204	3	32.8	10
	March	0.154	0.154	0.154	3	32.8	10
	April	0.0729	0.0730	0.0730	3	32.8	10
	May	0.0192	0.0192	0.0192	3	32.8	10
	June	0.00250	0.00250	0.00250	3	32.8	10
	July	0.0444	0.0444	0.0445	3	32.8	10
	August	0.234	0.234	0.234	3	32.8	10
	September	0.131	0.131	0.131	3	32.8	10
	October	0.0244	0.0244	0.0244	3	32.8	10
	November	0.107	0.107	0.107	3	32.8	10
	December	0.130	0.130	0.130	3	32.8	10
Operations (2018-2042)	January	0.146	0.146	0.146	3	32.8	10
	February	0.204	0.204	0.204	3	32.8	10
	March	0.155	0.155	0.155	3	32.8	10
	April	0.0732	0.0732	0.0732	3	32.8	10
	May	0.0193	0.0193	0.0193	3	32.8	10
	June	0.0025	0.0025	0.0025	3	32.8	10
	July	0.0446	0.0446	0.0446	3	32.8	10
	August	0.235	0.235	0.235	3	32.8	10
	September	0.132	0.131	0.132	3	32.8	10
	October	0.0244	0.0244	0.0244	3	32.8	10
	November	0.106	0.106	0.106	3	32.8	10
	December	0.130	0.130	0.130	3	32.8	10
Closure (2043-2060)	January	0.145	0.145	0.145	3	32.8	10
	February	0.202	0.202	0.202	3	32.8	10
	March	0.154	0.154	0.154	3	32.8	10
	April	0.0726	0.0726	0.0726	3	32.8	10
	May	0.0190	0.0190	0.0190	3	32.8	10
	June	0.00250	0.00250	0.00250	3	32.8	10
	July	0.0441	0.0441	0.0441	3	32.8	10
	August	0.231	0.231	0.231	3	32.8	10
	September	0.130	0.130	0.130	3	32.8	10
	October	0.0244	0.0244	0.0244	3	32.8	10
	November	0.107	0.107	0.107	3	32.8	10
	December	0.130	0.130	0.130	3	32.8	10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6z. M19 Creek Hazard Quotients for Nitrate, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0485	0.00443	0.0145
	February	0.0678	0.00620	0.0204
	March	0.0515	0.00471	0.0154
	April	0.0243	0.00223	0.00730
	May	0.00640	0.000586	0.00192
	June	0.000833	0.0000762	0.000250
	July	0.0148	0.00136	0.00445
	August	0.0779	0.00713	0.0234
	September	0.0437	0.00400	0.0131
	October	0.00813	0.000743	0.00244
	November	0.0355	0.00325	0.0107
	December	0.0434	0.00397	0.0130
Operations (2018-2042)	January	0.0486	0.00445	0.0146
	February	0.0680	0.00622	0.0204
	March	0.0515	0.00471	0.0155
	April	0.0244	0.00223	0.00732
	May	0.00643	0.000588	0.00193
	June	0.000833	0.0000762	0.000250
	July	0.0149	0.00136	0.00446
	August	0.0782	0.00716	0.0235
	September	0.0438	0.00401	0.0132
	October	0.00812	0.000743	0.00244
	November	0.0354	0.00325	0.0106
	December	0.0434	0.00397	0.0130
Closure (2043-2060)	January	0.0482	0.00441	0.0145
	February	0.0675	0.00617	0.0202
	March	0.0513	0.00469	0.0154
	April	0.0242	0.00221	0.00726
	May	0.00634	0.000579	0.00190
	June	0.000833	0.0000762	0.000250
	July	0.0147	0.00134	0.00441
	August	0.0771	0.00705	0.0231
	September	0.0434	0.00397	0.0130
	October	0.00813	0.000743	0.00244
	November	0.0356	0.00326	0.0107
	December	0.0435	0.00397	0.0130

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G6aa. M19 Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines ¹		Drinking Water Quality Guidelines
		Nitrite Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.00100	0.00100	0.00100	0.0600	0.180	1
	February	0.00100	0.00100	0.00100	0.0600	0.180	1
	March	0.00100	0.00100	0.00100	0.0800	0.240	1
	April	0.000500	0.000500	0.000500	0.0800	0.240	1
	May	0.000500	0.000500	0.000500	0.0400	0.120	1
	June	0.000500	0.000500	0.000500	0.0400	0.120	1
	July	0.000720	0.000720	0.000722	0.0400	0.120	1
	August	0.00522	0.00522	0.00522	0.0800	0.240	1
	September	0.00099	0.00099	0.00100	0.0200	0.0600	1
	October	0.00099	0.00099	0.00100	0.0400	0.120	1
	November	0.00099	0.00099	0.00100	0.0400	0.120	1
	December	0.00099	0.00099	0.00100	0.0400	0.120	1
Operations (2018-2042)	January	0.000971	0.000973	0.000986	0.0600	0.180	1
	February	0.000971	0.000973	0.000986	0.0600	0.180	1
	March	0.000971	0.000973	0.000986	0.100	0.300	1
	April	0.000500	0.000500	0.000500	0.0800	0.240	1
	May	0.000500	0.000500	0.000500	0.0400	0.120	1
	June	0.000500	0.000500	0.000500	0.0400	0.120	1
	July	0.000709	0.000710	0.000716	0.0400	0.120	1
	August	0.00522	0.00522	0.00522	0.0800	0.240	1
	September	0.000971	0.000972	0.000986	0.0200	0.0600	1
	October	0.000971	0.000972	0.000986	0.0400	0.120	1
	November	0.000971	0.000972	0.000986	0.0400	0.120	1
	December	0.000971	0.000972	0.000986	0.0400	0.120	1
Closure (2043-2060)	January	0.00104	0.00104	0.00104	0.0600	0.180	1
	February	0.00104	0.00104	0.00104	0.0600	0.180	1
	March	0.00104	0.00104	0.00104	0.0800	0.240	1
	April	0.000500	0.000500	0.000500	0.0800	0.240	1
	May	0.000500	0.000500	0.000500	0.0400	0.120	1
	June	0.000500	0.000500	0.000500	0.0400	0.120	1
	July	0.000739	0.000739	0.000739	0.0400	0.120	1
	August	0.00522	0.00522	0.00522	0.0800	0.240	1
	September	0.00104	0.00104	0.00104	0.0400	0.120	1
	October	0.00104	0.00104	0.00104	0.0400	0.120	1
	November	0.00104	0.00104	0.00104	0.0400	0.120	1
	December	0.00104	0.00104	0.00104	0.0400	0.120	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are chloride dependent

Appendix 8-G6aa. M19 Creek Hazard Quotients for Nitrite, Base Case

Project Phase	Months	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0166	0.00555	0.00100
	February	0.0166	0.00555	0.00100
	March	0.0124	0.00416	0.00100
	April	0.00625	0.00208	0.000500
	May	0.0125	0.00417	0.000500
	June	0.0125	0.00417	0.000500
	July	0.018	0.00601	0.000722
	August	0.0653	0.0218	0.00522
	September	0.0497	0.0166	0.00100
	October	0.0248	0.00832	0.00100
	November	0.0248	0.00832	0.00100
	December	0.0248	0.00832	0.00100
Operations (2018-2042)	January	0.0162	0.00548	0.000986
	February	0.0162	0.00548	0.000986
	March	0.00973	0.00329	0.000986
	April	0.00625	0.00208	0.000500
	May	0.0125	0.00417	0.000500
	June	0.0125	0.00417	0.000500
	July	0.0177	0.00597	0.000716
	August	0.0653	0.0218	0.00522
	September	0.0486	0.0164	0.000986
	October	0.0243	0.00822	0.000986
	November	0.0243	0.00822	0.000986
	December	0.0243	0.00822	0.000986
Closure (2043-2060)	January	0.0173	0.00576	0.00104
	February	0.0173	0.00576	0.00104
	March	0.0130	0.00432	0.00104
	April	0.00625	0.00208	0.000500
	May	0.0125	0.00417	0.000500
	June	0.0125	0.00417	0.000500
	July	0.0185	0.00616	0.000739
	August	0.0652	0.02175	0.00522
	September	0.0259	0.00864	0.00104
	October	0.0259	0.00864	0.00104
	November	0.0259	0.00864	0.00104
	December	0.0259	0.00864	0.00104

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ *Guidelines are chloride dependent*

Appendix 8-G6ab. M19 Creek Hazard Quotients for Ammonia, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Ammonia Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	February	0.00500	0.00500	0.00500	0.491	3.61	0.0102	0.00138
	March	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	April	0.00508	0.00508	0.00508	0.491	3.61	0.0103	0.00141
	May	0.00722	0.00722	0.00722	0.491	3.61	0.0147	0.00200
	June	0.00756	0.00756	0.00757	0.491	3.61	0.0154	0.00210
	July	0.00857	0.00857	0.00858	0.491	3.61	0.0175	0.00238
	August	0.00445	0.00445	0.00446	0.491	3.61	0.00907	0.00123
	September	0.00508	0.00508	0.00508	0.491	3.61	0.0103	0.00141
	October	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	November	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	December	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
Operations (2018-2042)	January	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	February	0.00499	0.00499	0.00500	0.491	3.61	0.0102	0.00138
	March	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	April	0.00510	0.00510	0.00510	0.491	3.61	0.0104	0.00141
	May	0.00722	0.00722	0.00722	0.491	3.61	0.0147	0.00200
	June	0.00758	0.00758	0.00758	0.491	3.61	0.0154	0.00210
	July	0.00855	0.00855	0.00857	0.491	3.61	0.0174	0.00237
	August	0.00445	0.00445	0.00445	0.491	3.61	0.00906	0.00123
	September	0.00507	0.00507	0.00508	0.491	3.61	0.0103	0.00141
	October	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	November	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	December	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
Closure (2043-2060)	January	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	February	0.00501	0.00501	0.00501	0.491	3.61	0.0102	0.00139
	March	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	April	0.00505	0.00505	0.00505	0.491	3.61	0.0103	0.00140
	May	0.00721	0.00721	0.00721	0.491	3.61	0.0147	0.00200
	June	0.00753	0.00753	0.00753	0.491	3.61	0.0153	0.00209
	July	0.00861	0.00861	0.00861	0.491	3.61	0.0175	0.00238
	August	0.00446	0.00446	0.00446	0.491	3.61	0.00909	0.00124
	September	0.00508	0.00508	0.00508	0.491	3.61	0.0104	0.00141
	October	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	November	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692
	December	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000692

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are pH and temperature dependent

Appendix 8-G6ac. M19 Creek Hazard Quotients for Sulphate Base Case

Project Phase	Months	Predicted Water Quality			Aquatic Life Guidelines ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Sulphate Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	38.5	38.3	38.5	429	500	0.0894	0.0769
	February	43.7	43.6	43.7	429	500	0.102	0.0875
	March	50.4	50.2	50.5	429	500	0.117	0.101
	April	21.8	21.8	21.9	309	500	0.0706	0.0438
	May	22.0	21.9	22.0	309	500	0.0709	0.0441
	June	15.8	15.8	15.9	309	500	0.0511	0.0317
	July	23.2	23.2	23.4	309	500	0.0751	0.0467
	August	415	415	416	429	500	0.968	0.831
	September	36.8	36.8	37.1	429	500	0.0858	0.0742
	October	38.5	38.5	38.8	429	500	0.0897	0.0776
	November	45.9	45.9	46.4	429	500	0.107	0.0927
	December	47.5	47.5	48.0	429	500	0.111	0.0959
Operations (2018-2042)	January	37.1	37.1	37.8	429	500	0.0864	0.0755
	February	42.1	42.1	42.9	429	500	0.0981	0.0858
	March	48.5	48.5	49.5	429	500	0.113	0.0990
	April	21.3	21.3	21.6	309	500	0.0691	0.0432
	May	21.2	21.2	21.6	309	500	0.0687	0.0433
	June	15.3	15.4	15.6	309	500	0.0497	0.0312
	July	22.4	22.4	22.9	309	500	0.0726	0.0458
	August	417	417	417	429	500	0.971	0.834
	September	35.6	35.6	36.4	429	500	0.0830	0.0727
	October	37.1	37.2	38.0	429	500	0.0867	0.0761
	November	44.3	44.4	45.4	429	500	0.103	0.0908
	December	45.9	46.0	47.0	429	500	0.107	0.0940
Closure (2043-2060)	January	41.0	41.0	41.0	429	500	0.0955	0.0819
	February	46.7	46.7	46.7	429	500	0.109	0.0933
	March	53.8	53.8	53.8	429	500	0.125	0.108
	April	22.7	22.7	22.7	309	500	0.0735	0.0454
	May	23.2	23.2	23.2	309	500	0.0752	0.0465
	June	16.7	16.7	16.7	309	500	0.0540	0.0334
	July	24.8	24.8	24.8	309	500	0.0802	0.0496
	August	413	413	413	429	500	0.962	0.825
	September	39.6	39.6	39.6	429	500	0.0924	0.0793
	October	41.4	41.4	41.4	429	500	0.0964	0.0827
	November	49.5	49.5	49.5	429	500	0.115	0.0989
	December	51.1	51.1	51.1	429	500	0.119	0.102

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7
Murray River (MR7)

MURRAY RIVER COAL PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement

Appendix 8-G7a. Murray River (MR7) Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	Predicted Water Quality						Aquatic Life Guidelines for Dissolved Aluminum ¹	
		Dissolved Aluminum Concentration			Total Aluminum Concentration			BC MOE 30-Day Mean	BC MOE Maximum
		Median	Mean	Maximum	Median	Mean	Maximum		
Construction (2015-2017)	January	0.00151	0.00152	0.00155	0.0303	0.0303	0.0304	0.05	0.10
	February	0.00151	0.00152	0.00154	0.0170	0.0170	0.0170	0.05	0.10
	March	0.00151	0.00151	0.00151	0.0265	0.0265	0.0265	0.05	0.10
	April	0.00151	0.00151	0.00151	0.129	0.129	0.129	0.05	0.10
	May	0.0226	0.0226	0.0226	0.943	0.943	0.943	0.05	0.10
	June	0.0168	0.0168	0.0168	0.204	0.204	0.204	0.05	0.10
	July	0.0110	0.0110	0.0110	0.357	0.357	0.357	0.05	0.10
	August	0.00880	0.00880	0.00881	0.157	0.157	0.157	0.05	0.10
	September	0.00820	0.00821	0.00821	0.292	0.292	0.292	0.05	0.10
	October	0.00470	0.00470	0.00471	0.0670	0.0670	0.0670	0.05	0.10
	November	0.00150	0.00151	0.00154	0.0981	0.0981	0.0981	0.05	0.10
	December	0.00151	0.00152	0.00156	0.0307	0.0307	0.0307	0.05	0.10
Operations (2018-2042)	January	0.00149	0.00156	0.00212	0.0302	0.0302	0.0304	0.05	0.10
	February	0.00150	0.00158	0.00232	0.0168	0.0168	0.0173	0.05	0.10
	March	0.00150	0.00157	0.00223	0.0263	0.0264	0.0267	0.05	0.10
	April	0.00150	0.00154	0.00178	0.129	0.129	0.129	0.05	0.10
	May	0.0226	0.0226	0.0227	0.943	0.943	0.943	0.05	0.10
	June	0.0168	0.0168	0.0169	0.204	0.204	0.204	0.05	0.10
	July	0.0110	0.0110	0.0111	0.357	0.357	0.357	0.05	0.10
	August	0.00880	0.00882	0.00896	0.157	0.157	0.157	0.05	0.10
	September	0.00821	0.00823	0.00845	0.292	0.292	0.292	0.05	0.10
	October	0.00470	0.00472	0.00487	0.0669	0.0669	0.0670	0.05	0.10
	November	0.00150	0.00157	0.00210	0.0980	0.0980	0.0982	0.05	0.10
	December	0.00149	0.00160	0.00239	0.0305	0.0305	0.0309	0.05	0.10
Closure (2043-2060)	January	0.00151	0.00151	0.00151	0.0305	0.0305	0.0305	0.05	0.10
	February	0.00151	0.00151	0.00151	0.0171	0.0171	0.0171	0.05	0.10
	March	0.00151	0.00151	0.00151	0.0267	0.0267	0.0267	0.05	0.10
	April	0.00151	0.00151	0.00151	0.129	0.129	0.129	0.05	0.10
	May	0.0226	0.0226	0.0226	0.943	0.943	0.943	0.05	0.10
	June	0.0168	0.0168	0.0168	0.204	0.204	0.204	0.05	0.10
	July	0.0110	0.0110	0.0110	0.357	0.357	0.357	0.05	0.10
	August	0.00881	0.00881	0.00881	0.157	0.157	0.157	0.05	0.10
	September	0.00820	0.00820	0.00820	0.292	0.292	0.292	0.05	0.10
	October	0.00470	0.00470	0.00470	0.0670	0.0670	0.0670	0.05	0.10
	November	0.00151	0.00151	0.00151	0.0982	0.0982	0.0982	0.05	0.10
	December	0.00151	0.00151	0.00151	0.0309	0.0309	0.0309	0.05	0.10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

¹ Guidelines are pH dependent

Appendix 8-G7a. Murray River (MR7) Hazard Quotients for Dissolved and Total Aluminum, Base Case

Project Phase	Month	BC MOE Working Water Quality Guidelines for Wildlife Water Supply for Total Aluminum	Hazard Quotient relative to Aquatic Life Guideline for Dissolved Aluminum		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply for Total Aluminum
		BC MOE 30-Day Mean	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	5	0.0303	0.0155	0.00607
	February	5	0.0304	0.0154	0.00339
	March	5	0.0302	0.0151	0.00530
	April	5	0.0302	0.0151	0.0258
	May	5	0.452	0.226	0.189
	June	5	0.336	0.168	0.0408
	July	5	0.220	0.110	0.0714
	August	5	0.176	0.0881	0.0314
	September	5	0.164	0.0821	0.0584
	October	5	0.0941	0.0471	0.0134
	November	5	0.0303	0.0154	0.0196
	December	5	0.0304	0.0156	0.00614
Operations (2018-2042)	January	5	0.0312	0.0212	0.00603
	February	5	0.0317	0.0232	0.00336
	March	5	0.0314	0.0223	0.00527
	April	5	0.0308	0.0178	0.0258
	May	5	0.453	0.227	0.189
	June	5	0.336	0.169	0.0408
	July	5	0.220	0.111	0.0714
	August	5	0.176	0.0896	0.0314
	September	5	0.165	0.0845	0.0584
	October	5	0.0945	0.0487	0.0134
	November	5	0.0314	0.0210	0.0196
	December	5	0.0320	0.0239	0.00611
Closure (2043-2060)	January	5	0.0301	0.0151	0.00609
	February	5	0.0301	0.0151	0.00342
	March	5	0.0301	0.0151	0.00533
	April	5	0.0303	0.0151	0.0258
	May	5	0.452	0.226	0.189
	June	5	0.336	0.168	0.0408
	July	5	0.220	0.110	0.0714
	August	5	0.176	0.0881	0.0314
	September	5	0.164	0.0820	0.0584
	October	5	0.0941	0.0470	0.0134
	November	5	0.0302	0.0151	0.0196
	December	5	0.0301	0.0151	0.00618

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

¹ Guidelines are pH dependent

Appendix 8-G7b. Murray River (MR7) Hazard Quotients for Total Antimony, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Antimony Concentration			BC MOE Working Guideline	BC Working DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC Working DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000521	0.0000525	0.0000553	0.020	0.014	0.00263	0.00395
	February	0.0000502	0.0000523	0.0000566	0.020	0.014	0.00261	0.00404
	March	0.0000501	0.0000520	0.0000560	0.020	0.014	0.00260	0.00400
	April	0.0000501	0.0000506	0.0000518	0.020	0.014	0.00253	0.00370
	May	0.0000900	0.0000901	0.0000903	0.020	0.014	0.00451	0.00645
	June	0.0000500	0.0000501	0.0000502	0.020	0.014	0.00250	0.00359
	July	0.0000500	0.0000502	0.0000507	0.020	0.014	0.00251	0.00362
	August	0.0000500	0.0000504	0.0000511	0.020	0.014	0.00252	0.00365
	September	0.0000501	0.0000507	0.0000521	0.020	0.014	0.00254	0.00372
	October	0.0000501	0.0000505	0.0000514	0.020	0.014	0.00252	0.00367
	November	0.0000502	0.0000517	0.0000549	0.020	0.014	0.00258	0.00392
	December	0.0000503	0.0000527	0.0000578	0.020	0.014	0.00264	0.00413
Operations (2018-2042)	January	0.0000501	0.0000508	0.0000551	0.020	0.014	0.00254	0.00393
	February	0.0000501	0.0000508	0.0000566	0.020	0.014	0.00254	0.00405
	March	0.0000501	0.0000507	0.0000560	0.020	0.014	0.00253	0.00400
	April	0.0000500	0.0000504	0.0000524	0.020	0.014	0.00252	0.00374
	May	0.0000902	0.0000903	0.0000911	0.020	0.014	0.00452	0.00651
	June	0.0000500	0.0000501	0.0000505	0.020	0.014	0.00251	0.00360
	July	0.0000500	0.0000501	0.0000508	0.020	0.014	0.00251	0.00363
	August	0.0000500	0.0000502	0.0000513	0.020	0.014	0.00251	0.00366
	September	0.0000500	0.0000503	0.0000520	0.020	0.014	0.00251	0.00372
	October	0.0000500	0.0000502	0.0000514	0.020	0.014	0.00251	0.00367
	November	0.0000501	0.0000506	0.0000548	0.020	0.014	0.00253	0.00392
	December	0.0000501	0.0000510	0.0000573	0.020	0.014	0.00255	0.00409
Closure (2043-2060)	January	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	February	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	March	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	April	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	May	0.0000900	0.0000900	0.0000900	0.020	0.014	0.00450	0.00643
	June	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	July	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	August	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	September	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	October	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	November	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357
	December	0.0000500	0.0000500	0.0000500	0.020	0.014	0.00250	0.00357

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7c. Murray River (MR7) Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Arsenic Concentration			BC MOE Maximum	BC DWQG	Maximum
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000215	0.000216	0.000216	0.005	0.025	0.025
	February	0.000145	0.000146	0.000147	0.005	0.025	0.025
	March	0.000125	0.000126	0.000127	0.005	0.025	0.025
	April	0.000180	0.000180	0.000180	0.005	0.025	0.025
	May	0.000515	0.000515	0.000515	0.005	0.025	0.025
	June	0.000220	0.000220	0.000220	0.005	0.025	0.025
	July	0.000260	0.000260	0.000260	0.005	0.025	0.025
	August	0.000200	0.000200	0.000200	0.005	0.025	0.025
	September	0.000225	0.000225	0.000226	0.005	0.025	0.025
	October	0.000160	0.000160	0.000160	0.005	0.025	0.025
	November	0.000170	0.000171	0.000171	0.005	0.025	0.025
	December	0.000151	0.000151	0.000152	0.005	0.025	0.025
Operations (2018-2042)	January	0.000215	0.000216	0.000221	0.005	0.025	0.025
	February	0.000145	0.000146	0.000154	0.005	0.025	0.025
	March	0.000125	0.000126	0.000133	0.005	0.025	0.025
	April	0.000180	0.000180	0.000183	0.005	0.025	0.025
	May	0.000515	0.000515	0.000516	0.005	0.025	0.025
	June	0.000220	0.000220	0.000221	0.005	0.025	0.025
	July	0.000260	0.000260	0.000261	0.005	0.025	0.025
	August	0.000200	0.000200	0.000202	0.005	0.025	0.025
	September	0.000225	0.000225	0.000228	0.005	0.025	0.025
	October	0.000160	0.000160	0.000162	0.005	0.025	0.025
	November	0.000170	0.000171	0.000176	0.005	0.025	0.025
	December	0.000150	0.000151	0.000159	0.005	0.025	0.025
Closure (2043-2060)	January	0.000215	0.000215	0.000215	0.005	0.025	0.025
	February	0.000145	0.000145	0.000145	0.005	0.025	0.025
	March	0.000125	0.000125	0.000125	0.005	0.025	0.025
	April	0.000180	0.000180	0.000180	0.005	0.025	0.025
	May	0.000515	0.000515	0.000515	0.005	0.025	0.025
	June	0.000220	0.000220	0.000220	0.005	0.025	0.025
	July	0.000260	0.000260	0.000260	0.005	0.025	0.025
	August	0.000200	0.000200	0.000200	0.005	0.025	0.025
	September	0.000225	0.000225	0.000225	0.005	0.025	0.025
	October	0.000160	0.000160	0.000160	0.005	0.025	0.025
	November	0.000170	0.000170	0.000170	0.005	0.025	0.025
	December	0.000150	0.000150	0.000150	0.005	0.025	0.025

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7c. Murray River (MR7) Hazard Quotients for Total Arsenic, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guidelines
Construction (2015-2017)	January	0.0433	0.00865	0.00865
	February	0.0293	0.00587	0.00587
	March	0.0253	0.00506	0.00506
	April	0.0361	0.00722	0.00722
	May	0.103	0.0206	0.0206
	June	0.0440	0.00880	0.00880
	July	0.0520	0.0104	0.0104
	August	0.0401	0.00801	0.00801
	September	0.0451	0.00902	0.00902
	October	0.0321	0.00641	0.00641
	November	0.0342	0.00685	0.00685
	December	0.0304	0.00608	0.00608
Operations (2018-2042)	January	0.0443	0.00886	0.00886
	February	0.0307	0.00614	0.00614
	March	0.0265	0.00531	0.00531
	April	0.0366	0.00732	0.00732
	May	0.103	0.0206	0.0206
	June	0.0441	0.00882	0.00882
	July	0.0522	0.0104	0.0104
	August	0.0403	0.00807	0.00807
	September	0.0455	0.00910	0.00910
	October	0.0324	0.00647	0.00647
	November	0.0352	0.00705	0.00705
	December	0.0319	0.00638	0.00638
Closure (2043-2060)	January	0.0430	0.00860	0.00860
	February	0.0290	0.00580	0.00580
	March	0.0250	0.00500	0.00500
	April	0.0360	0.00720	0.00720
	May	0.103	0.0206	0.0206
	June	0.0440	0.00880	0.00880
	July	0.0520	0.0104	0.0104
	August	0.0400	0.00800	0.00800
	September	0.0450	0.00900	0.00900
	October	0.0320	0.00640	0.00640
	November	0.0340	0.00680	0.00680
	December	0.0300	0.00600	0.00600

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7d. Murray River (MR7) Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Total Barium Concentration			BC MOE 30-Day Mean Working Guideline	BC MOE Maximum Working Guideline	Canadian DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0665	0.0665	0.0667	1	5	1
	February	0.0680	0.0681	0.0683	1	5	1
	March	0.0727	0.0728	0.0730	1	5	1
	April	0.0795	0.0795	0.0796	1	5	1
	May	0.0613	0.0613	0.0613	1	5	1
	June	0.0367	0.0367	0.0367	1	5	1
	July	0.0416	0.0416	0.0416	1	5	1
	August	0.0510	0.0510	0.0511	1	5	1
	September	0.0389	0.0389	0.0390	1	5	1
	October	0.0473	0.0473	0.0474	1	5	1
	November	0.0559	0.0560	0.0561	1	5	1
	December	0.0551	0.0552	0.0555	1	5	1
Operations (2018-2042)	January	0.0665	0.0665	0.0669	1	5	1
	February	0.0681	0.0681	0.0686	1	5	1
	March	0.0728	0.0728	0.0733	1	5	1
	April	0.0795	0.0795	0.0797	1	5	1
	May	0.0613	0.0614	0.0615	1	5	1
	June	0.0367	0.0367	0.0368	1	5	1
	July	0.0416	0.0416	0.0417	1	5	1
	August	0.0510	0.0510	0.0511	1	5	1
	September	0.0389	0.0389	0.0391	1	5	1
	October	0.0473	0.0473	0.0474	1	5	1
	November	0.0559	0.0560	0.0564	1	5	1
	December	0.0551	0.0552	0.0558	1	5	1
Closure (2043-2060)	January	0.0664	0.0664	0.0664	1	5	1
	February	0.0680	0.0680	0.0680	1	5	1
	March	0.0727	0.0727	0.0727	1	5	1
	April	0.0795	0.0795	0.0795	1	5	1
	May	0.0613	0.0613	0.0613	1	5	1
	June	0.0367	0.0367	0.0367	1	5	1
	July	0.0416	0.0416	0.0416	1	5	1
	August	0.0510	0.0510	0.0510	1	5	1
	September	0.0389	0.0389	0.0389	1	5	1
	October	0.0473	0.0473	0.0473	1	5	1
	November	0.0559	0.0559	0.0559	1	5	1
	December	0.0551	0.0551	0.0551	1	5	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7d. Murray River (MR7) Hazard Quotients for Total Barium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs. BC MOE 30-Day Mean Working Guideline	Maximum Predicted vs. BC MOE Maximum Working Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.0665	0.0133	0.0667
	February	0.0681	0.0137	0.0683
	March	0.0728	0.0146	0.0730
	April	0.0795	0.0159	0.0796
	May	0.0613	0.0123	0.0613
	June	0.0367	0.00734	0.0367
	July	0.0416	0.00833	0.0416
	August	0.0510	0.0102	0.0511
	September	0.0389	0.00780	0.0390
	October	0.0473	0.00947	0.0474
	November	0.0560	0.0112	0.0561
	December	0.0552	0.0111	0.0555
Operations (2018-2042)	January	0.0665	0.0134	0.0669
	February	0.0681	0.0137	0.0686
	March	0.0728	0.0147	0.0733
	April	0.0795	0.0159	0.0797
	May	0.0614	0.0123	0.0615
	June	0.0367	0.00735	0.0368
	July	0.0416	0.00834	0.0417
	August	0.0510	0.0102	0.0511
	September	0.0389	0.00782	0.0391
	October	0.0473	0.00949	0.0474
	November	0.0560	0.0113	0.0564
	December	0.0552	0.0112	0.0558
Closure (2043-2060)	January	0.0664	0.0133	0.0664
	February	0.0680	0.0136	0.0680
	March	0.0727	0.0145	0.0727
	April	0.0795	0.0159	0.0795
	May	0.0613	0.0123	0.0613
	June	0.0367	0.00735	0.0367
	July	0.0416	0.00832	0.0416
	August	0.0510	0.0102	0.0510
	September	0.0389	0.00778	0.0389
	October	0.0473	0.00946	0.0473
	November	0.0559	0.0112	0.0559
	December	0.0551	0.0110	0.0551

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7e. Murray River (MR7) Hazard Quotients for Total Beryllium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Beryllium Concentration			BC MOE Working Guideline	BC DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000500	0.000502	0.000505	0.0053	0.004	0.00953	0.0126
	February	0.000501	0.000502	0.000504	0.0053	0.004	0.00951	0.0126
	March	0.000501	0.000501	0.000502	0.0053	0.004	0.00946	0.0125
	April	0.000502	0.000501	0.000502	0.0053	0.004	0.00947	0.0125
	May	0.000501	0.000500	0.000501	0.0053	0.004	0.00945	0.0125
	June	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	July	0.000500	0.000500	0.000501	0.0053	0.004	0.00945	0.0125
	August	0.000500	0.000500	0.000501	0.0053	0.004	0.00945	0.0125
	September	0.000500	0.000501	0.000501	0.0053	0.004	0.00946	0.0125
	October	0.000500	0.000500	0.000501	0.0053	0.004	0.00945	0.0125
	November	0.000500	0.000502	0.000504	0.0053	0.004	0.00951	0.0126
	December	0.000500	0.000502	0.000507	0.0053	0.004	0.00956	0.0127
Operations (2018-2042)	January	0.000501	0.000505	0.000542	0.0053	0.004	0.0102	0.0135
	February	0.000501	0.000507	0.000555	0.0053	0.004	0.0105	0.0139
	March	0.000501	0.000506	0.000549	0.0053	0.004	0.0104	0.0137
	April	0.000500	0.000503	0.000519	0.0053	0.004	0.00980	0.0130
	May	0.000501	0.000502	0.000505	0.0053	0.004	0.00952	0.0126
	June	0.000500	0.000501	0.000504	0.0053	0.004	0.00950	0.0126
	July	0.000500	0.000501	0.000507	0.0053	0.004	0.00956	0.0127
	August	0.000500	0.000501	0.000510	0.0053	0.004	0.00963	0.0128
	September	0.000500	0.000502	0.000517	0.0053	0.004	0.00975	0.0129
	October	0.000500	0.000502	0.000511	0.0053	0.004	0.00965	0.0128
	November	0.000501	0.000505	0.000541	0.0053	0.004	0.0102	0.0135
	December	0.000501	0.000508	0.000561	0.0053	0.004	0.0106	0.0140
Closure (2043-2060)	January	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	February	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	March	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	April	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	May	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	June	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	July	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	August	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	September	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	October	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125
	November	0.000500	0.000500	0.000500	0.0053	0.004	0.00944	0.0125
	December	0.000500	0.000500	0.000500	0.0053	0.004	0.00943	0.0125

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7f. Murray River (MR7) Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply	Hazard Quotient relative to Aquatic Life Guideline
		Total Boron Concentration			BC MOE Maximum	BC DWQG	Maximum	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0110	0.0110	0.0110	1.2	5	5	0.00921
	February	0.0115	0.0115	0.0115	1.2	5	5	0.00962
	March	0.0125	0.0125	0.0125	1.2	5	5	0.0105
	April	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	May	0.00801	0.00800	0.00801	1.2	5	5	0.00667
	June	0.00500	0.00500	0.00500	1.2	5	5	0.00417
	July	0.0120	0.0120	0.0120	1.2	5	5	0.0100
	August	0.00501	0.00501	0.00501	1.2	5	5	0.00417
	September	0.00501	0.00501	0.00501	1.2	5	5	0.00418
	October	0.00501	0.00501	0.00501	1.2	5	5	0.00418
	November	0.0110	0.0110	0.0110	1.2	5	5	0.00920
	December	0.0131	0.0130	0.0131	1.2	5	5	0.0109
Operations (2018-2042)	January	0.0110	0.0111	0.0115	1.2	5	5	0.00956
	February	0.0115	0.0116	0.0121	1.2	5	5	0.0101
	March	0.0125	0.0126	0.0131	1.2	5	5	0.0109
	April	0.0140	0.0140	0.0142	1.2	5	5	0.0118
	May	0.00802	0.00803	0.00808	1.2	5	5	0.00673
	June	0.00500	0.00501	0.00504	1.2	5	5	0.00420
	July	0.0120	0.0120	0.0121	1.2	5	5	0.0101
	August	0.00500	0.00502	0.00512	1.2	5	5	0.00427
	September	0.00500	0.00502	0.00519	1.2	5	5	0.00433
	October	0.00500	0.00502	0.00513	1.2	5	5	0.00427
	November	0.0110	0.0111	0.0115	1.2	5	5	0.00955
	December	0.0130	0.0131	0.0137	1.2	5	5	0.0114
Closure (2043-2060)	January	0.0110	0.0110	0.0110	1.2	5	5	0.00917
	February	0.0115	0.0115	0.0115	1.2	5	5	0.00959
	March	0.0125	0.0125	0.0125	1.2	5	5	0.0104
	April	0.0140	0.0140	0.0140	1.2	5	5	0.0117
	May	0.00800	0.00800	0.00800	1.2	5	5	0.00667
	June	0.00500	0.00500	0.00500	1.2	5	5	0.00417
	July	0.0120	0.0120	0.0120	1.2	5	5	0.0100
	August	0.00500	0.00500	0.00500	1.2	5	5	0.00417
	September	0.00500	0.00500	0.00500	1.2	5	5	0.00417
	October	0.00500	0.00500	0.00500	1.2	5	5	0.00417
	November	0.0110	0.0110	0.0110	1.2	5	5	0.00917
	December	0.0130	0.0130	0.0130	1.2	5	5	0.0108

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7f. Murray River (MR7) Hazard Quotients for Total Boron, Base Case

Project Phase	Month	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Maximum Predicted vs. BC Drinking Water Quality Guidelines	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.00221	0.00221
	February	0.00231	0.00231
	March	0.00251	0.00251
	April	0.00280	0.00280
	May	0.00160	0.00160
	June	0.00100	0.00100
	July	0.00240	0.00240
	August	0.00100	0.00100
	September	0.00100	0.00100
	October	0.00100	0.00100
	November	0.00221	0.00221
	December	0.00261	0.00261
Operations (2018-2042)	January	0.00229	0.00229
	February	0.00242	0.00242
	March	0.00261	0.00261
	April	0.00284	0.00284
	May	0.00162	0.00162
	June	0.00101	0.00101
	July	0.00242	0.00242
	August	0.00102	0.00102
	September	0.00104	0.00104
	October	0.00103	0.00103
	November	0.00229	0.00229
	December	0.00274	0.00274
Closure (2043-2060)	January	0.00220	0.00220
	February	0.00230	0.00230
	March	0.00250	0.00250
	April	0.00280	0.00280
	May	0.00160	0.00160
	June	0.00100	0.00100
	July	0.00240	0.00240
	August	0.00100	0.00100
	September	0.00100	0.00100
	October	0.00100	0.00100
	November	0.00220	0.00220
	December	0.00260	0.00260

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7g. Murray River (MR7) Hazard Quotients for Total Cadmium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Cadmium Concentration						
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000160	0.0000107	0.0000160	0.0000	0.005	0.32257	0.00320
	February	0.0000130	0.0000130	0.0000130	0.0001	0.005	0.236354	0.00260
	March	0.0000255	0.0000255	0.0000255	0.0001	0.005	0.47029	0.00510
	April	0.0000180	0.0000180	0.0000180	0.0001	0.005	0.34260	0.00360
	May	0.0000625	0.0000625	0.0000625	0.0000	0.005	1.72609	0.0125
	June	0.0000290	0.0000290	0.0000290	0.0000	0.005	1.02431	0.00580
	July	0.0000320	0.0000320	0.0000320	0.0000	0.005	1.05768	0.00640
	August	0.0000150	0.0000150	0.0000150	0.0000	0.005	0.61186	0.00300
	September	0.0000165	0.0000165	0.0000165	0.0000	0.005	0.55731	0.00330
	October	0.0000130	0.0000130	0.0000130	0.0000	0.005	0.31538	0.00260
	November	0.0000190	0.0000190	0.0000190	0.0000	0.005	0.45493	0.00380
	December	0.0000100	0.00000999	0.0000100	0.0000	0.005	0.213066	0.00200
Operations (2018-2042)	January	0.0000160	0.00000961	0.0000160	0.0000	0.005	0.32335	0.00321
	February	0.0000130	0.0000130	0.0000131	0.0001	0.005	0.23779	0.00262
	March	0.0000255	0.0000255	0.0000256	0.0001	0.005	0.47164	0.00512
	April	0.0000180	0.0000180	0.0000180	0.0001	0.005	0.34337	0.00361
	May	0.0000625	0.0000625	0.0000625	0.0000	0.005	1.72636	0.0125
	June	0.0000290	0.0000174	0.0000290	0.0000	0.005	1.02441	0.00580
	July	0.0000320	0.0000320	0.0000320	0.0000	0.005	1.05797	0.00640
	August	0.0000150	0.0000150	0.0000150	0.0000	0.005	0.61247	0.00300
	September	0.0000165	0.0000165	0.0000165	0.0000	0.005	0.55797	0.00330
	October	0.0000130	0.0000130	0.0000130	0.0000	0.005	0.31573	0.00260
	November	0.0000190	0.0000190	0.0000190	0.0000	0.005	0.45593	0.00381
	December	0.0000100	0.0000100	0.0000101	0.0000	0.005	0.214760	0.00202
Closure (2043-2060)	January	0.0000160	0.0000160	0.0000160	0.0000	0.005	0.32261	0.00320
	February	0.0000130	0.0000130	0.0000130	0.0001	0.005	0.236337	0.00260
	March	0.0000255	0.0000255	0.0000255	0.0001	0.005	0.47022	0.00510
	April	0.0000180	0.0000180	0.0000180	0.0001	0.005	0.34295	0.00360
	May	0.0000625	0.0000625	0.0000625	0.0000	0.005	1.72646	0.0125
	June	0.0000290	0.0000290	0.0000290	0.0000	0.005	1.02452	0.00580
	July	0.0000320	0.0000320	0.0000320	0.0000	0.005	1.05768	0.00640
	August	0.0000150	0.0000150	0.0000150	0.0000	0.005	0.61203	0.00300
	September	0.0000165	0.0000165	0.0000165	0.0000	0.005	0.55736	0.00330
	October	0.0000130	0.0000130	0.0000130	0.0000	0.005	0.31546	0.00260
	November	0.0000190	0.0000190	0.0000190	0.0000	0.005	0.45502	0.00380
	December	0.0000100	0.0000100	0.0000100	0.0000	0.005	0.213192	0.00200

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G7h. Murray River (MR7) Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines Canadian DWQG
		Total Chromium Concentration			CCME Cr VI Guideline	CCME CR III Guideline	
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000140	0.000140	0.000140	0.001	0.0089	0.05
	February	0.000110	0.000110	0.000110	0.001	0.0089	0.05
	March	0.000535	0.000535	0.000535	0.001	0.0089	0.05
	April	0.000270	0.000270	0.000270	0.001	0.0089	0.05
	May	0.00145	0.00145	0.00145	0.001	0.0089	0.05
	June	0.000380	0.000380	0.000380	0.001	0.0089	0.05
	July	0.000640	0.000640	0.000640	0.001	0.0089	0.05
	August	0.000380	0.000380	0.000380	0.001	0.0089	0.05
	September	0.000590	0.000590	0.000590	0.001	0.0089	0.05
	October	0.000300	0.000300	0.000300	0.001	0.0089	0.05
	November	0.000270	0.000270	0.000270	0.001	0.0089	0.05
	December	0.000220	0.000220	0.000220	0.001	0.0089	0.05
Operations (2018-2042)	January	0.000140	0.000140	0.000143	0.001	0.0089	0.05
	February	0.000110	0.000110	0.000115	0.001	0.0089	0.05
	March	0.000536	0.000536	0.000539	0.001	0.0089	0.05
	April	0.000270	0.000270	0.000271	0.001	0.0089	0.05
	May	0.001455	0.001455	0.001455	0.001	0.0089	0.05
	June	0.000380	0.000380	0.000380	0.001	0.0089	0.05
	July	0.000640	0.000640	0.000640	0.001	0.0089	0.05
	August	0.000380	0.000380	0.000381	0.001	0.0089	0.05
	September	0.000590	0.000590	0.000591	0.001	0.0089	0.05
	October	0.000300	0.000300	0.000301	0.001	0.0089	0.05
	November	0.000270	0.000270	0.000273	0.001	0.0089	0.05
	December	0.000220	0.000220	0.000225	0.001	0.0089	0.05
Closure (2043-2060)	January	0.000140	0.000140	0.000140	0.001	0.0089	0.05
	February	0.000110	0.000110	0.000110	0.001	0.0089	0.05
	March	0.000535	0.000535	0.000535	0.001	0.0089	0.05
	April	0.000270	0.000270	0.000270	0.001	0.0089	0.05
	May	0.00146	0.00146	0.00146	0.001	0.0089	0.05
	June	0.000380	0.000380	0.000380	0.001	0.0089	0.05
	July	0.000640	0.000640	0.000640	0.001	0.0089	0.05
	August	0.000380	0.000380	0.000380	0.001	0.0089	0.05
	September	0.000590	0.000590	0.000590	0.001	0.0089	0.05
	October	0.000300	0.000300	0.000300	0.001	0.0089	0.05
	November	0.000270	0.000270	0.000270	0.001	0.0089	0.05
	December	0.000220	0.000220	0.000220	0.001	0.0089	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

CCME = Canadian Council of Ministers of the Environment

Appendix 8-G7h. Murray River (MR7) Hazard Quotients for Total Chromium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Maximum Predicted vs. CCME Cr VI Guideline	Maximum Predicted vs. CCME Cr III Guideline	Maximum Predicted vs. Canadian DWQG
Construction (2015-2017)	January	0.140	0.0158	0.00280
	February	0.110	0.0124	0.00220
	March	0.535	0.0601	0.0107
	April	0.270	0.0303	0.00540
	May	1.45	0.163	0.0291
	June	0.380	0.0427	0.00760
	July	0.640	0.0719	0.0128
	August	0.380	0.0427	0.00760
	September	0.590	0.0663	0.0118
	October	0.300	0.0337	0.00600
	November	0.270	0.0304	0.00540
	December	0.220	0.0248	0.00441
Operations (2018-2042)	January	0.143	0.0161	0.00286
	February	0.115	0.0129	0.00229
	March	0.539	0.0605	0.0108
	April	0.271	0.0305	0.00542
	May	1.46	0.164	0.0291
	June	0.380	0.0427	0.00760
	July	0.640	0.0720	0.0128
	August	0.381	0.0428	0.00762
	September	0.591	0.0664	0.0118
	October	0.301	0.0338	0.00602
	November	0.273	0.0307	0.00546
	December	0.225	0.0252	0.00449
Closure (2043-2060)	January	0.140	0.0157	0.00280
	February	0.110	0.0124	0.00220
	March	0.535	0.0601	0.0107
	April	0.270	0.0304	0.00540
	May	1.46	0.163	0.0291
	June	0.3801	0.0427	0.00760
	July	0.640	0.0719	0.0128
	August	0.380	0.0427	0.00760
	September	0.590	0.0663	0.0118
	October	0.300	0.0337	0.00600
	November	0.270	0.0303	0.00540
	December	0.220	0.0247	0.00440

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

CCME = Canadian Council of Ministers of the Environment

Appendix 8-G7i. Murray River (MR7) Hazard Quotients for Total Cobalt, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Cobalt Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	February	0.0000500	0.0000500	0.0000501	0.004	0.110	0.0125	0.000455
	March	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	April	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000454
	May	0.000515	0.000515	0.000515	0.004	0.110	0.129	0.00468
	June	0.000150	0.000150	0.000150	0.004	0.110	0.0375	0.00136
	July	0.000240	0.000240	0.000240	0.004	0.110	0.0600	0.00218
	August	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	September	0.000145	0.000145	0.000145	0.004	0.110	0.0363	0.00132
	October	0.0000500	0.0000500	0.0000500	0.004	0.110	0.0125	0.000455
	November	0.000100	0.000100	0.000100	0.004	0.110	0.0250	0.000910
	December	0.0000500	0.0000500	0.0000501	0.004	0.110	0.0125	0.000456
Operations (2018-2042)	January	0.0000499	0.0000502	0.0000525	0.004	0.110	0.0125	0.000477
	February	0.0000501	0.0000504	0.0000537	0.004	0.110	0.0126	0.000488
	March	0.0000500	0.0000503	0.0000532	0.004	0.110	0.0126	0.000484
	April	0.0000500	0.0000501	0.0000512	0.004	0.110	0.0125	0.000465
	May	0.000515	0.000515	0.000515	0.004	0.110	0.129	0.00469
	June	0.000150	0.000150	0.000150	0.004	0.110	0.0375	0.00137
	July	0.000240	0.000240	0.000240	0.004	0.110	0.0600	0.00219
	August	0.0000500	0.0000501	0.0000507	0.004	0.110	0.0125	0.000461
	September	0.000145	0.000145	0.000146	0.004	0.110	0.0363	0.00133
	October	0.0000500	0.0000501	0.0000507	0.004	0.110	0.0125	0.000461
	November	0.000100	0.000100	0.000103	0.004	0.110	0.0251	0.000933
	December	0.0000500	0.0000504	0.0000539	0.004	0.110	0.0126	0.000490
Closure (2043-2060)	January	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455
	February	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455
	March	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455
	April	0.0000502	0.0000502	0.0000502	0.004	0.110	0.0126	0.000457
	May	0.000515	0.000515	0.000515	0.004	0.110	0.129	0.00468
	June	0.000150	0.000150	0.000150	0.004	0.110	0.0375	0.00136
	July	0.000240	0.000240	0.000240	0.004	0.110	0.0600	0.00218
	August	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455
	September	0.000145	0.000145	0.000145	0.004	0.110	0.0363	0.00132
	October	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455
	November	0.000100	0.000100	0.000100	0.004	0.110	0.0250	0.000910
	December	0.0000501	0.0000501	0.0000501	0.004	0.110	0.0125	0.000455

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7j. Murray River (MR7) Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹		BC MOE Working Water Quality Guidelines for Wildlife Water Supply 30-Day Mean
		Total Copper Concentration			BC MOE 30-Day Mean	BC MOE Maximum	
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000250	0.000250	0.000250	0.00640	0.0170	0.3
	February	0.000250	0.000250	0.000250	0.00722	0.0190	0.3
	March	0.000250	0.000250	0.000250	0.00710	0.0187	0.3
	April	0.000250	0.000250	0.000250	0.00684	0.0181	0.3
	May	0.00164	0.00164	0.00164	0.00444	0.0124	0.3
	June	0.000650	0.000650	0.000650	0.00333	0.00983	0.3
	July	0.000790	0.000790	0.000790	0.00360	0.0105	0.3
	August	0.000250	0.000250	0.000250	0.00282	0.00863	0.3
	September	0.000525	0.000525	0.000525	0.00351	0.0103	0.3
	October	0.000250	0.000250	0.000250	0.00516	0.0141	0.3
	November	0.000470	0.000470	0.000470	0.00524	0.0143	0.3
	December	0.000530	0.000530	0.000530	0.00600	0.0161	0.3
Operations (2018-2042)	January	0.000250	0.000251	0.000257	0.00640	0.0170	0.3
	February	0.000250	0.000251	0.000260	0.00722	0.0190	0.3
	March	0.000250	0.000251	0.000258	0.00710	0.0187	0.3
	April	0.000250	0.000250	0.000253	0.00684	0.0181	0.3
	May	0.00164	0.00164	0.00164	0.00444	0.0124	0.3
	June	0.000650	0.000650	0.000651	0.00333	0.00983	0.3
	July	0.000790	0.000790	0.000791	0.00360	0.0105	0.3
	August	0.000250	0.000250	0.000252	0.00282	0.00863	0.3
	September	0.000525	0.000525	0.000528	0.00351	0.0103	0.3
	October	0.000250	0.000250	0.000252	0.00516	0.0141	0.3
	November	0.000470	0.000471	0.000476	0.00524	0.0143	0.3
	December	0.000530	0.000531	0.000539	0.00600	0.0161	0.3
Closure (2043-2060)	January	0.000250	0.000250	0.000250	0.00640	0.0170	0.3
	February	0.000250	0.000250	0.000250	0.00722	0.0190	0.3
	March	0.000250	0.000250	0.000250	0.00710	0.0187	0.3
	April	0.000250	0.000250	0.000250	0.00684	0.0181	0.3
	May	0.00164	0.00164	0.00164	0.00444	0.0124	0.3
	June	0.000650	0.000650	0.000650	0.00333	0.00983	0.3
	July	0.000790	0.000790	0.000790	0.00360	0.0105	0.3
	August	0.000250	0.000250	0.000250	0.00282	0.00863	0.3
	September	0.000525	0.000525	0.000525	0.00351	0.0103	0.3
	October	0.000250	0.000250	0.000250	0.00516	0.0141	0.3
	November	0.000470	0.000470	0.000470	0.00524	0.0143	0.3
	December	0.000530	0.000530	0.000530	0.00600	0.0161	0.3

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7j. Murray River (MR7) Hazard Quotients for Total Copper, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean	Maximum Predicted vs. BC Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean GL
Construction (2015-2017)	January	0.0391	0.0147	0.000833
	February	0.0346	0.0132	0.000834
	March	0.0352	0.0134	0.000833
	April	0.0365	0.0138	0.000833
	May	0.370	0.132	0.00547
	June	0.195	0.0661	0.00217
	July	0.219	0.0755	0.00263
	August	0.0886	0.0290	0.000833
	September	0.149	0.0512	0.00175
	October	0.0484	0.0177	0.000833
	November	0.0897	0.0328	0.00157
	December	0.0883	0.0329	0.00177
Operations (2018-2042)	January	0.0392	0.0151	0.000835
	February	0.0348	0.0137	0.000837
	March	0.0353	0.0138	0.000836
	April	0.0366	0.0140	0.000834
	May	0.370	0.132	0.00547
	June	0.195	0.0662	0.00217
	July	0.219	0.0756	0.00263
	August	0.0887	0.0292	0.00083
	September	0.150	0.0515	0.00175
	October	0.0485	0.0178	0.000834
	November	0.0898	0.0333	0.00157
	December	0.0885	0.0335	0.00177
Closure (2043-2060)	January	0.0391	0.0147	0.000834
	February	0.0346	0.0132	0.000834
	March	0.0352	0.0134	0.000834
	April	0.0366	0.0139	0.000834
	May	0.370	0.132	0.00547
	June	0.195	0.0661	0.00217
	July	0.219	0.0755	0.00263
	August	0.0887	0.0290	0.000834
	September	0.149	0.0512	0.00175
	October	0.0485	0.0177	0.000834
	November	0.0897	0.0328	0.00157
	December	0.0883	0.0329	0.00177

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7k. Murray River (MR7) Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Predicted Water Quality					
		Dissolved Iron Concentration			Total Iron Concentration		
		Median	Mean	Maximum	Median	Mean	Maximum
Construction (2015-2017)	January	0.0390	0.0390	0.0390	0.158	0.158	0.158
	February	0.0150	0.0150	0.0150	0.131	0.131	0.131
	March	0.0230	0.0230	0.0230	0.139	0.139	0.139
	April	0.0330	0.0330	0.0330	0.281	0.281	0.281
	May	0.0360	0.0360	0.0360	1.20	1.20	1.20
	June	0.0150	0.0150	0.0150	0.265	0.265	0.265
	July	0.0150	0.0150	0.0150	0.553	0.553	0.553
	August	0.0150	0.0150	0.0150	0.198	0.198	0.198
	September	0.0150	0.0150	0.0150	0.341	0.340	0.341
	October	0.0150	0.0150	0.0150	0.134	0.134	0.134
	November	0.0470	0.0470	0.0470	0.241	0.241	0.241
	December	0.0150	0.0150	0.0150	0.116	0.116	0.116
Operations (2018-2042)	January	0.0391	0.0391	0.0393	0.159	0.159	0.160
	February	0.0150	0.0151	0.0155	0.132	0.132	0.132
	March	0.0230	0.0231	0.0234	0.139	0.139	0.139
	April	0.0330	0.0330	0.0332	0.281	0.281	0.281
	May	0.0360	0.0360	0.0360	1.20	1.20	1.20
	June	0.0150	0.0150	0.0150	0.265	0.265	0.265
	July	0.0150	0.0150	0.0151	0.553	0.553	0.553
	August	0.0150	0.0150	0.0151	0.198	0.198	0.198
	September	0.0150	0.0150	0.0151	0.341	0.341	0.341
	October	0.0150	0.0150	0.0151	0.134	0.134	0.134
	November	0.0471	0.0471	0.0473	0.241	0.241	0.241
	December	0.0150	0.0151	0.0155	0.116	0.116	0.116
Closure (2043-2060)	January	0.0390	0.0390	0.0390	0.159	0.159	0.159
	February	0.0150	0.0150	0.0150	0.132	0.132	0.132
	March	0.0230	0.0230	0.0230	0.139	0.139	0.139
	April	0.0330	0.0330	0.0330	0.281	0.281	0.281
	May	0.0360	0.0360	0.0360	1.20	1.20	1.20
	June	0.0150	0.0150	0.0150	0.265	0.265	0.265
	July	0.0150	0.0150	0.0150	0.553	0.553	0.553
	August	0.0150	0.0150	0.0150	0.198	0.198	0.198
	September	0.0150	0.0150	0.0150	0.340	0.340	0.340
	October	0.0150	0.0150	0.0150	0.134	0.134	0.134
	November	0.0470	0.0470	0.0470	0.241	0.241	0.241
	December	0.0150	0.0150	0.0150	0.116	0.116	0.116

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7k. Murray River (MR7) Hazard Quotients for Dissolved and Total Iron, Base Case

Project Phase	Month	Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		BC MOE Maximum Guideline for Dissolved Iron	BC MOE Maximum Guideline for Total Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Dissolved Iron	Maximum Predicted vs. BC MOE Maximum Guideline for Total Iron
Construction (2015-2017)	January	0.35	1	0.112	0.158
	February	0.35	1	0.0429	0.131
	March	0.35	1	0.0657	0.139
	April	0.35	1	0.0943	0.281
	May	0.35	1	0.103	1.20
	June	0.35	1	0.0429	0.265
	July	0.35	1	0.0429	0.553
	August	0.35	1	0.0429	0.198
	September	0.35	1	0.0429	0.341
	October	0.35	1	0.0429	0.134
	November	0.35	1	0.134	0.241
	December	0.35	1	0.0430	0.116
Operations (2018-2042)	January	0.35	1	0.112	0.160
	February	0.35	1	0.0442	0.132
	March	0.35	1	0.0669	0.139
	April	0.35	1	0.0947	0.281
	May	0.35	1	0.103	1.20
	June	0.35	1	0.0429	0.265
	July	0.35	1	0.0430	0.553
	August	0.35	1	0.0431	0.198
	September	0.35	1	0.0433	0.341
	October	0.35	1	0.0431	0.134
	November	0.35	1	0.135	0.241
	December	0.35	1	0.0443	0.116
Closure (2043-2060)	January	0.35	1	0.111	0.159
	February	0.35	1	0.0429	0.132
	March	0.35	1	0.0657	0.139
	April	0.35	1	0.0943	0.281
	May	0.35	1	0.103	1.20
	June	0.35	1	0.0429	0.265
	July	0.35	1	0.0429	0.553
	August	0.35	1	0.0429	0.198
	September	0.35	1	0.0429	0.340
	October	0.35	1	0.0429	0.134
	November	0.35	1	0.134	0.241
	December	0.35	1	0.0429	0.116

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G71. Murray River (MR7) Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline [†]		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Lead Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	BC MOE 30-Day Mean
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000250	0.0000250	0.0000252	0.00910	0.100	0.05	0.1
	February	0.0000250	0.0000251	0.0000252	0.0101	0.116	0.05	0.1
	March	0.0000250	0.0000250	0.0000250	0.00992	0.114	0.05	0.1
	April	0.0000950	0.0000950	0.0000950	0.00961	0.109	0.05	0.1
	May	0.000660	0.000660	0.000660	0.00695	0.0626	0.05	0.1
	June	0.000192	0.000192	0.000192	0.00584	0.0435	0.05	0.1
	July	0.000324	0.000324	0.000324	0.00610	0.0480	0.05	0.1
	August	0.000134	0.000134	0.000134	0.00535	0.0351	0.05	0.1
	September	0.000200	0.000200	0.000200	0.00601	0.0464	0.05	0.1
	October	0.0000600	0.0000600	0.0000600	0.00771	0.0758	0.05	0.1
	November	0.000138	0.000138	0.000138	0.00780	0.0773	0.05	0.1
	December	0.0000250	0.0000250	0.0000253	0.00865	0.0918	0.05	0.1
Operations (2018-2042)	January	0.0000249	0.0000252	0.0000272	0.00910	0.100	0.05	0.1
	February	0.0000250	0.0000253	0.0000280	0.0101	0.116	0.05	0.1
	March	0.0000249	0.0000252	0.0000277	0.00992	0.114	0.05	0.1
	April	0.0000950	0.0000951	0.0000959	0.00961	0.109	0.05	0.1
	May	0.000661	0.000661	0.000661	0.00695	0.0626	0.05	0.1
	June	0.000192	0.000192	0.000192	0.00584	0.0435	0.05	0.1
	July	0.000324	0.000324	0.000324	0.00610	0.0480	0.05	0.1
	August	0.000134	0.000134	0.000134	0.00535	0.0351	0.05	0.1
	September	0.000200	0.000200	0.000200	0.00601	0.0464	0.05	0.1
	October	0.0000600	0.0000601	0.0000606	0.00771	0.0758	0.05	0.1
	November	0.000138	0.000138	0.000140	0.00780	0.0773	0.05	0.1
	December	0.0000249	0.0000253	0.0000282	0.00865	0.0918	0.05	0.1
Closure (2043-2060)	January	0.0000250	0.0000250	0.0000250	0.00910	0.100	0.05	0.1
	February	0.0000250	0.0000250	0.0000250	0.0101	0.116	0.05	0.1
	March	0.0000250	0.0000250	0.0000250	0.00992	0.114	0.05	0.1
	April	0.0000951	0.0000951	0.0000951	0.00961	0.109	0.05	0.1
	May	0.000661	0.000661	0.000661	0.00695	0.0626	0.05	0.1
	June	0.000192	0.000192	0.000192	0.00584	0.0435	0.05	0.1
	July	0.000324	0.000324	0.000324	0.00610	0.0480	0.05	0.1
	August	0.000134	0.000134	0.000134	0.00535	0.0351	0.05	0.1
	September	0.000200	0.000200	0.000200	0.00601	0.0464	0.05	0.1
	October	0.0000600	0.0000600	0.0000600	0.00771	0.0758	0.05	0.1
	November	0.000138	0.000138	0.000138	0.00780	0.0773	0.05	0.1
	December	0.0000250	0.0000250	0.0000250	0.00865	0.0918	0.05	0.1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

[†] Guidelines are hardness dependent

Appendix 8-G71. Murray River (MR7) Hazard Quotients for Total Lead, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline
Construction (2015-2017)	January	0.00275	0.000253	0.000504	0.000250
	February	0.00249	0.000216	0.000503	0.000251
	March	0.00252	0.000220	0.000500	0.000250
	April	0.00988	0.000876	0.00190	0.000950
	May	0.0951	0.0106	0.0132	0.00660
	June	0.0329	0.00442	0.00384	0.00192
	July	0.0531	0.00676	0.00648	0.00324
	August	0.0250	0.00382	0.00268	0.00134
	September	0.0332	0.00430	0.00399	0.00200
	October	0.00778	0.000792	0.00120	0.000600
	November	0.0176	0.00178	0.00275	0.00138
	December	0.00290	0.000275	0.000505	0.000250
Operations (2018-2042)	January	0.00276	0.000273	0.000544	0.000252
	February	0.00251	0.000241	0.000560	0.000253
	March	0.00254	0.000243	0.000554	0.000252
	April	0.00989	0.000884	0.00192	0.000951
	May	0.0951	0.0106	0.0132	0.00661
	June	0.0329	0.00442	0.00384	0.00192
	July	0.0532	0.00676	0.00649	0.00324
	August	0.0251	0.00383	0.00269	0.00134
	September	0.0332	0.00431	0.00401	0.00200
	October	0.00778	0.000799	0.00121	0.000601
	November	0.0177	0.00181	0.00279	0.00138
	December	0.00292	0.000307	0.000564	0.000253
Closure (2043-2060)	January	0.00275	0.000251	0.000500	0.000250
	February	0.00248	0.000215	0.000500	0.000250
	March	0.00252	0.000220	0.000500	0.000250
	April	0.00989	0.000876	0.00190	0.000951
	May	0.0951	0.0106	0.0132	0.00661
	June	0.0329	0.00442	0.00384	0.00192
	July	0.0531	0.00676	0.00648	0.00324
	August	0.0250	0.00382	0.00268	0.00134
	September	0.0332	0.00430	0.00399	0.00200
	October	0.00778	0.000792	0.00120	0.000600
	November	0.0176	0.00178	0.00275	0.00138
	December	0.00289	0.000272	0.000500	0.000250

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7m. Murray River (MR7) Hazard Quotients for Total Lithium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Lithium Concentration			BC MOE Working Final Chronic Value Guideline	BC MOE Working Maximum Guideline	Maximum Predicted vs. BC MOE Working Final Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00644	0.00648	0.00658	0.096	0.87	0.0685	0.00756
	February	0.00707	0.00710	0.00717	0.096	0.87	0.0747	0.00824
	March	0.00773	0.00773	0.00773	0.096	0.87	0.0806	0.00889
	April	0.00749	0.00748	0.00750	0.096	0.87	0.0781	0.00862
	May	0.00290	0.00290	0.00290	0.096	0.87	0.0302	0.00334
	June	0.00157	0.00157	0.00158	0.096	0.87	0.0164	0.00181
	July	0.00256	0.00256	0.00258	0.096	0.87	0.0268	0.00296
	August	0.00310	0.00311	0.00313	0.096	0.87	0.0326	0.00360
	September	0.00241	0.00241	0.00244	0.096	0.87	0.0254	0.00281
	October	0.00329	0.00330	0.00332	0.096	0.87	0.0346	0.00382
	November	0.00467	0.00470	0.00479	0.096	0.87	0.0499	0.00550
	December	0.00588	0.00592	0.00607	0.096	0.87	0.0633	0.00698
Operations (2018-2042)	January	0.00640	0.00656	0.00793	0.096	0.87	0.0827	0.00912
	February	0.00703	0.00724	0.00904	0.096	0.87	0.0941	0.0104
	March	0.00769	0.00788	0.00949	0.096	0.87	0.0989	0.0109
	April	0.00743	0.00753	0.00815	0.096	0.87	0.0849	0.00937
	May	0.00293	0.00294	0.00306	0.096	0.87	0.0319	0.00352
	June	0.00157	0.00159	0.00170	0.096	0.87	0.0177	0.00195
	July	0.00255	0.00258	0.00281	0.096	0.87	0.0292	0.00322
	August	0.00309	0.00314	0.00348	0.096	0.87	0.0362	0.00400
	September	0.00239	0.00246	0.00302	0.096	0.87	0.0314	0.00347
	October	0.00328	0.00333	0.00370	0.096	0.87	0.0385	0.00425
	November	0.00464	0.00482	0.00614	0.096	0.87	0.0639	0.00705
	December	0.00583	0.00610	0.00808	0.096	0.87	0.0842	0.00929
Closure (2043-2060)	January	0.00640	0.00640	0.00640	0.096	0.87	0.0666	0.00735
	February	0.00702	0.00702	0.00702	0.096	0.87	0.0731	0.00807
	March	0.00768	0.00768	0.00768	0.096	0.87	0.0800	0.00883
	April	0.00743	0.00743	0.00743	0.096	0.87	0.0774	0.00854
	May	0.00288	0.00288	0.00288	0.096	0.87	0.0300	0.00331
	June	0.00156	0.00156	0.00156	0.096	0.87	0.0163	0.00179
	July	0.00255	0.00255	0.00255	0.096	0.87	0.0266	0.00293
	August	0.00309	0.00309	0.00309	0.096	0.87	0.0322	0.00355
	September	0.00239	0.00239	0.00239	0.096	0.87	0.0249	0.00275
	October	0.00328	0.00328	0.00328	0.096	0.87	0.0342	0.00377
	November	0.00463	0.00463	0.00463	0.096	0.87	0.0482	0.00532
	December	0.00582	0.00582	0.00582	0.096	0.87	0.0606	0.00669

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7n. Murray River (MR7) Hazard Quotients for Total Manganese, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Manganese Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs. BC 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00859	0.00859	0.00860	1.31	2.30	0.00657	0.00373
	February	0.00813	0.00813	0.00813	1.40	2.53	0.00581	0.00322
	March	0.00898	0.00898	0.00898	1.39	2.50	0.00648	0.00360
	April	0.0143	0.0143	0.0143	1.36	2.42	0.0105	0.00590
	May	0.0269	0.0269	0.0269	1.09	1.76	0.0246	0.0153
	June	0.0102	0.0102	0.0102	0.972	1.46	0.0105	0.00699
	July	0.0158	0.0158	0.0158	1.00	1.53	0.0158	0.0103
	August	0.0117	0.0117	0.0117	0.915	1.32	0.0128	0.00888
	September	0.0122	0.0122	0.0122	0.991	1.51	0.0123	0.00810
	October	0.0110	0.0110	0.0110	1.17	1.96	0.00938	0.00561
	November	0.0108	0.0108	0.0108	1.18	1.98	0.00913	0.00544
	December	0.00558	0.00558	0.00558	1.27	2.19	0.00441	0.00255
Operations (2018-2042)	January	0.00861	0.00861	0.00864	1.31	2.30	0.00657	0.00375
	February	0.00815	0.00815	0.00816	1.40	2.53	0.00582	0.00323
	March	0.00899	0.00899	0.00901	1.39	2.50	0.00649	0.00361
	April	0.0143	0.0143	0.0143	1.36	2.42	0.0105	0.00590
	May	0.0269	0.0269	0.0269	1.09	1.76	0.0246	0.0153
	June	0.0102	0.0102	0.0102	0.972	1.46	0.0105	0.00699
	July	0.0158	0.0158	0.0158	1.00	1.53	0.0158	0.0103
	August	0.0117	0.0117	0.0117	0.915	1.32	0.0128	0.00889
	September	0.0122	0.0122	0.0122	0.991	1.51	0.0123	0.00811
	October	0.0110	0.0110	0.0110	1.17	1.96	0.00938	0.00561
	November	0.0108	0.0108	0.0108	1.18	1.98	0.00913	0.00545
	December	0.00559	0.00559	0.00560	1.27	2.19	0.00442	0.00255
Closure (2043-2060)	January	0.00860	0.00860	0.00860	1.31	2.30	0.00657	0.00373
	February	0.00813	0.00813	0.00813	1.40	2.53	0.00581	0.00321
	March	0.00898	0.00898	0.00898	1.39	2.50	0.00648	0.00360
	April	0.0143	0.0143	0.0143	1.36	2.42	0.0105	0.00590
	May	0.0269	0.0269	0.0269	1.09	1.76	0.0246	0.0153
	June	0.0102	0.0102	0.0102	0.972	1.46	0.0105	0.00699
	July	0.0158	0.0158	0.0158	1.00	1.53	0.0158	0.0103
	August	0.0117	0.0117	0.0117	0.915	1.32	0.0128	0.00888
	September	0.0122	0.0122	0.0122	0.991	1.51	0.0123	0.00810
	October	0.0110	0.0110	0.0110	1.17	1.96	0.00938	0.00561
	November	0.0108	0.0108	0.0108	1.18	1.98	0.00913	0.00543
	December	0.00558	0.00558	0.00558	1.27	2.19	0.00441	0.00254

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7o. Murray River (MR7) Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Mercury Concentration			BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	BC DWQG	BC MOE 30-Day Mean if MeHg is 0.5% of THg
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	February	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	March	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	May	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	June	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	July	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	October	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	November	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	December	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
Operations (2018-2042)	January	0.0000501	0.0000501	0.000050	0.00002	0.001	0.00002
	February	0.0000501	0.0000501	0.0000505	0.00002	0.001	0.00002
	March	0.0000501	0.0000501	0.0000504	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000502	0.00002	0.001	0.00002
	May	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	June	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	July	0.0000500	0.0000500	0.0000501	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000501	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000501	0.00002	0.001	0.00002
	October	0.0000501	0.0000501	0.0000501	0.00002	0.001	0.00002
	November	0.0000501	0.0000501	0.0000503	0.00002	0.001	0.00002
	December	0.0000501	0.0000501	0.0000505	0.00002	0.001	0.00002
Closure (2043-2060)	January	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	February	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	March	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	April	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	May	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	June	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	July	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	August	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	September	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	October	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	November	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002
	December	0.0000500	0.0000500	0.0000500	0.00002	0.001	0.00002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7o. Murray River (MR7) Hazard Quotients for Total Mercury, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg	Maximum Predicted vs. BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline if MeHg is 0.5% of THg
Construction (2015-2017)	January	0.250	0.00500	0.250
	February	0.250	0.00500	0.250
	March	0.250	0.00500	0.250
	April	0.250	0.00500	0.250
	May	0.250	0.00500	0.250
	June	0.250	0.00500	0.250
	July	0.250	0.00500	0.250
	August	0.250	0.00500	0.250
	September	0.250	0.00500	0.250
	October	0.250	0.00500	0.250
	November	0.250	0.00500	0.250
	December	0.250	0.00500	0.250
Operations (2018-2042)	January	0.251	0.00504	0.251
	February	0.251	0.00505	0.251
	March	0.251	0.00504	0.251
	April	0.250	0.00502	0.250
	May	0.250	0.00500	0.250
	June	0.250	0.00500	0.250
	July	0.250	0.00501	0.250
	August	0.250	0.00501	0.250
	September	0.250	0.00501	0.250
	October	0.250	0.00501	0.250
	November	0.250	0.00503	0.250
	December	0.251	0.00505	0.251
Closure (2043-2060)	January	0.250	0.00500	0.250
	February	0.250	0.00500	0.250
	March	0.250	0.00500	0.250
	April	0.250	0.00500	0.250
	May	0.250	0.00500	0.250
	June	0.250	0.00500	0.250
	July	0.250	0.00500	0.250
	August	0.250	0.00500	0.250
	September	0.250	0.00500	0.250
	October	0.250	0.00500	0.250
	November	0.250	0.00500	0.250
	December	0.250	0.00500	0.250

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7p. Murray River (MR7) Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Molybdenum Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	BC DWQG	Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000876	0.000876	0.000878	1	2	0.25	0.05
	February	0.000881	0.000880	0.000881	1	2	0.25	0.05
	March	0.000880	0.000881	0.000882	1	2	0.25	0.05
	April	0.000838	0.000838	0.000839	1	2	0.25	0.05
	May	0.000573	0.000573	0.000573	1	2	0.25	0.05
	June	0.000442	0.000442	0.000442	1	2	0.25	0.05
	July	0.000529	0.000529	0.000530	1	2	0.25	0.05
	August	0.000558	0.000558	0.000559	1	2	0.25	0.05
	September	0.000512	0.000512	0.000513	1	2	0.25	0.05
	October	0.000607	0.000607	0.000607	1	2	0.25	0.05
	November	0.000758	0.000758	0.000760	1	2	0.25	0.05
	December	0.000809	0.000809	0.000812	1	2	0.25	0.05
Operations (2018-2042)	January	0.000875	0.000881	0.000931	1	2	0.25	0.05
	February	0.000880	0.000887	0.000953	1	2	0.25	0.05
	March	0.000881	0.000888	0.000947	1	2	0.25	0.05
	April	0.000838	0.000841	0.000864	1	2	0.25	0.05
	May	0.000574	0.000576	0.000583	1	2	0.25	0.05
	June	0.000442	0.000443	0.000447	1	2	0.25	0.05
	July	0.000529	0.000530	0.000539	1	2	0.25	0.05
	August	0.000558	0.000560	0.000572	1	2	0.25	0.05
	September	0.000512	0.000515	0.000535	1	2	0.25	0.05
	October	0.000606	0.000608	0.000622	1	2	0.25	0.05
	November	0.000757	0.000764	0.000812	1	2	0.25	0.05
	December	0.000808	0.000818	0.000889	1	2	0.25	0.05
Closure (2043-2060)	January	0.00087	0.00087	0.00087	1	2	0.25	0.05
	February	0.00088	0.00088	0.00088	1	2	0.25	0.05
	March	0.00088	0.00088	0.000879	1	2	0.25	0.05
	April	0.000837	0.000837	0.000837	1	2	0.25	0.05
	May	0.000573	0.000573	0.000573	1	2	0.25	0.05
	June	0.000442	0.000442	0.000442	1	2	0.25	0.05
	July	0.000529	0.000529	0.000529	1	2	0.25	0.05
	August	0.000558	0.000558	0.000558	1	2	0.25	0.05
	September	0.00051	0.00051	0.00051	1	2	0.25	0.05
	October	0.000606	0.000606	0.000606	1	2	0.25	0.05
	November	0.000756	0.000756	0.000756	1	2	0.25	0.05
	December	0.000806	0.000806	0.000806	1	2	0.25	0.05

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7p. Murray River (MR7) Hazard Quotients for Total Molybdenum, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline	
		Construction (2015-2017)		January	0.000876	0.000439
		February	0.000880	0.000440	0.00352	0.0176
		March	0.000881	0.000441	0.00353	0.0176
		April	0.000838	0.000419	0.00335	0.0168
		May	0.000573	0.000287	0.00229	0.0115
		June	0.000442	0.000221	0.00177	0.00885
		July	0.000529	0.000265	0.00212	0.0106
		August	0.000558	0.000279	0.00224	0.0112
		September	0.000512	0.000256	0.00205	0.0103
		October	0.000607	0.000303	0.00243	0.0121
		November	0.000758	0.000380	0.00304	0.0152
		December	0.000809	0.000406	0.00325	0.0162
Operations (2018-2042)		January	0.000881	0.000466	0.00372	0.0186
		February	0.000887	0.000476	0.00381	0.0191
		March	0.000888	0.000473	0.00379	0.0189
		April	0.000841	0.000432	0.00346	0.0173
		May	0.000576	0.000291	0.00233	0.0117
		June	0.000443	0.000224	0.00179	0.00895
		July	0.000530	0.000269	0.00215	0.0108
		August	0.000560	0.000286	0.00229	0.0114
		September	0.000515	0.000267	0.00214	0.0107
		October	0.000608	0.000311	0.00249	0.0124
		November	0.000764	0.000406	0.00325	0.0162
		December	0.000818	0.000445	0.00356	0.0178
Closure (2043-2060)		January	0.000874	0.000437	0.00349	0.0175
		February	0.000878	0.000439	0.00351	0.0176
		March	0.000879	0.000440	0.00352	0.0176
		April	0.000837	0.000419	0.00335	0.0167
		May	0.000573	0.000286	0.00229	0.0115
		June	0.000442	0.000221	0.00177	0.00884
		July	0.000529	0.000265	0.00212	0.0106
		August	0.000558	0.000279	0.00223	0.0112
		September	0.000512	0.000256	0.00205	0.0102
		October	0.000606	0.000303	0.00242	0.0121
		November	0.000756	0.000378	0.00302	0.0151
		December	0.000806	0.000403	0.00322	0.0161

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7q. Murray River (MR7) Hazard Quotients for Total Nickel, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guideline ¹	Hazard Quotient relative to Aquatic Life Guideline
		Total Nickel Concentration			BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Guideline
		Median	Mean	Maximum		
Construction (2015-2017)	January	0.000250	0.000250	0.000250	0.110	0.00227
	February	0.000250	0.000250	0.000250	0.150	0.00167
	March	0.000250	0.000250	0.000250	0.110	0.00227
	April	0.000620	0.000620	0.000620	0.110	0.00564
	May	0.00211	0.00211	0.00211	0.0650	0.0324
	June	0.000740	0.000740	0.000740	0.0650	0.0114
	July	0.000860	0.000860	0.000860	0.0650	0.0132
	August	0.000250	0.000250	0.000250	0.0650	0.00385
	September	0.000555	0.000555	0.000555	0.0650	0.00854
	October	0.000250	0.000250	0.000250	0.110	0.00227
	November	0.000630	0.000630	0.000630	0.110	0.00573
	December	0.000250	0.000250	0.000250	0.110	0.00227
Operations (2018-2042)	January	0.000249	0.000251	0.000263	0.110	0.00239
	February	0.000250	0.000252	0.000269	0.150	0.00180
	March	0.000249	0.000251	0.000267	0.110	0.00243
	April	0.000620	0.000621	0.000626	0.110	0.00569
	May	0.00211	0.00211	0.00211	0.0650	0.0324
	June	0.000740	0.000740	0.000741	0.0650	0.0114
	July	0.000860	0.000860	0.000862	0.0650	0.0133
	August	0.000250	0.000251	0.000254	0.0650	0.00390
	September	0.000555	0.000556	0.000561	0.0650	0.00863
	October	0.000250	0.000250	0.000254	0.110	0.00231
	November	0.000631	0.000632	0.000644	0.110	0.00585
	December	0.000249	0.000252	0.000270	0.110	0.00246
Closure (2043-2060)	January	0.000250	0.000250	0.000250	0.110	0.00228
	February	0.000250	0.000250	0.000250	0.150	0.00167
	March	0.000250	0.000250	0.000250	0.110	0.00228
	April	0.000621	0.000621	0.000621	0.110	0.00564
	May	0.00211	0.00211	0.00211	0.0650	0.0324
	June	0.000740	0.000740	0.000740	0.0650	0.0114
	July	0.000860	0.000860	0.000860	0.0650	0.0132
	August	0.000250	0.000250	0.000250	0.0650	0.00385
	September	0.000555	0.000555	0.000555	0.0650	0.00854
	October	0.000250	0.000250	0.000250	0.110	0.00227
	November	0.000630	0.000630	0.000630	0.110	0.00573
	December	0.000250	0.000250	0.000250	0.110	0.00228

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guideline is hardness dependent

Appendix 8-G7r. Murray River (MR7) Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Total Selenium Concentration			BC MOE 30-Day	BC DWQG	Maximum
		Median	Mean	Maximum	Mean		
Construction (2015-2017)	January	0.000275	0.000275	0.000276	0.002	0.01	0.002
	February	0.000255	0.000255	0.000256	0.002	0.01	0.002
	March	0.000260	0.000260	0.000261	0.002	0.01	0.002
	April	0.000310	0.000310	0.000310	0.002	0.01	0.002
	May	0.000235	0.000235	0.000235	0.002	0.01	0.002
	June	0.000170	0.000170	0.000170	0.002	0.01	0.002
	July	0.000130	0.000130	0.000130	0.002	0.01	0.002
	August	0.000150	0.000150	0.000150	0.002	0.01	0.002
	September	0.000130	0.000130	0.000130	0.002	0.01	0.002
	October	0.000170	0.000170	0.000170	0.002	0.01	0.002
	November	0.000210	0.000210	0.000211	0.002	0.01	0.002
	December	0.000220	0.000220	0.000221	0.002	0.01	0.002
Operations (2018-2042)	January	0.000275	0.000277	0.000297	0.002	0.01	0.002
	February	0.000255	0.000258	0.000284	0.002	0.01	0.002
	March	0.000260	0.000263	0.000286	0.002	0.01	0.002
	April	0.000310	0.000312	0.000321	0.002	0.01	0.002
	May	0.000236	0.000237	0.000241	0.002	0.01	0.002
	June	0.000170	0.000171	0.000172	0.002	0.01	0.002
	July	0.000130	0.000131	0.000134	0.002	0.01	0.002
	August	0.000150	0.000151	0.000156	0.002	0.01	0.002
	September	0.000130	0.000131	0.000139	0.002	0.01	0.002
	October	0.000170	0.000171	0.000176	0.002	0.01	0.002
	November	0.000210	0.000213	0.000231	0.002	0.01	0.002
	December	0.000220	0.000224	0.000251	0.002	0.01	0.002
Closure (2043-2060)	January	0.000275	0.000275	0.000275	0.002	0.01	0.002
	February	0.000255	0.000255	0.000255	0.002	0.01	0.002
	March	0.000260	0.000260	0.000260	0.002	0.01	0.002
	April	0.000310	0.000310	0.000310	0.002	0.01	0.002
	May	0.000235	0.000235	0.000235	0.002	0.01	0.002
	June	0.000170	0.000170	0.000170	0.002	0.01	0.002
	July	0.000130	0.000130	0.000130	0.002	0.01	0.002
	August	0.000150	0.000150	0.000150	0.002	0.01	0.002
	September	0.000130	0.000130	0.000130	0.002	0.01	0.002
	October	0.000170	0.000170	0.000170	0.002	0.01	0.002
	November	0.000210	0.000210	0.000210	0.002	0.01	0.002
	December	0.000220	0.000220	0.000220	0.002	0.01	0.002

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7r. Murray River (MR7) Hazard Quotients for Total Selenium, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines	Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum predicted vs. BC DWQG	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.138	0.0276	0.138
	February	0.128	0.0256	0.128
	March	0.130	0.0261	0.130
	April	0.155	0.0310	0.155
	May	0.118	0.0235	0.118
	June	0.0850	0.0170	0.0850
	July	0.0650	0.0130	0.0651
	August	0.0750	0.0150	0.0751
	September	0.0650	0.0130	0.0651
	October	0.0850	0.0170	0.0851
	November	0.105	0.0211	0.105
	December	0.110	0.0221	0.111
Operations (2018-2042)	January	0.139	0.0297	0.149
	February	0.129	0.0284	0.142
	March	0.131	0.0286	0.143
	April	0.156	0.0321	0.160
	May	0.118	0.0241	0.120
	June	0.0853	0.0172	0.0860
	July	0.0653	0.0134	0.0668
	August	0.0754	0.0156	0.0778
	September	0.0655	0.0139	0.0694
	October	0.0853	0.0176	0.0879
	November	0.106	0.0231	0.115
	December	0.112	0.0251	0.126
Closure (2043-2060)	January	0.138	0.0275	0.138
	February	0.128	0.0255	0.128
	March	0.130	0.0260	0.130
	April	0.155	0.0310	0.155
	May	0.118	0.0235	0.118
	June	0.0851	0.0170	0.0851
	July	0.0651	0.0130	0.0651
	August	0.0751	0.0150	0.0751
	September	0.0650	0.0130	0.0650
	October	0.0851	0.0170	0.0851
	November	0.105	0.0210	0.105
	December	0.110	0.0220	0.110

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7s. Murray River (MR7) Hazard Quotients for Total Silver, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Silver Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000501	0.0000502	0.00150	0.00300	0.00334	0.00167
	February	0.0000500	0.0000501	0.0000502	0.00150	0.00300	0.00334	0.00167
	March	0.0000500	0.0000500	0.0000501	0.00150	0.00300	0.00334	0.00167
	April	0.0000500	0.0000500	0.0000501	0.00150	0.00300	0.00334	0.00167
	May	0.0000120	0.0000120	0.0000120	0.00150	0.00300	0.00800	0.00400
	June	0.0000500	0.0000500	0.0000500	0.000500	0.000100	0.1000	0.0500
	July	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.1000	0.0500
	August	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.1000	0.0500
	September	0.0000500	0.0000500	0.0000501	0.0000500	0.000100	0.1000	0.0501
	October	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	November	0.0000500	0.0000501	0.0000502	0.00150	0.00300	0.00334	0.00167
	December	0.0000500	0.0000501	0.0000503	0.00150	0.00300	0.00334	0.00168
Operations (2018-2042)	January	0.0000500	0.0000502	0.0000516	0.00150	0.00300	0.00335	0.00172
	February	0.0000501	0.0000503	0.0000522	0.00150	0.00300	0.00335	0.00174
	March	0.0000501	0.0000503	0.0000520	0.00150	0.00300	0.00335	0.00173
	April	0.0000500	0.0000501	0.0000507	0.00150	0.00300	0.00334	0.00169
	May	0.0000120	0.0000120	0.0000120	0.00150	0.00300	0.00801	0.00401
	June	0.0000500	0.0000500	0.0000501	0.0000500	0.000100	0.100	0.0501
	July	0.0000500	0.0000500	0.0000503	0.0000500	0.000100	0.100	0.0503
	August	0.0000500	0.0000501	0.0000504	0.0000500	0.000100	0.100	0.0504
	September	0.0000500	0.0000501	0.0000507	0.0000500	0.000100	0.100	0.0507
	October	0.0000500	0.0000501	0.0000504	0.00150	0.00300	0.00334	0.00168
	November	0.0000501	0.0000502	0.0000516	0.00150	0.00300	0.00335	0.00172
	December	0.0000501	0.0000504	0.0000524	0.00150	0.00300	0.00336	0.00175
Closure (2043-2060)	January	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	February	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	March	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	April	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00334	0.00167
	May	0.0000120	0.0000120	0.0000120	0.00150	0.00300	0.00800	0.00400
	June	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.100	0.0500
	July	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.100	0.0500
	August	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.100	0.0500
	September	0.0000500	0.0000500	0.0000500	0.0000500	0.000100	0.100	0.0500
	October	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	November	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167
	December	0.0000500	0.0000500	0.0000500	0.00150	0.00300	0.00333	0.00167

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7t. Murray River (MR7) Hazard Quotients for Total Thallium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Thallium Concentration			BC MOE Working Guideline	BC DWQG	Mean Predicted vs. BC MOE Working 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.0000500	0.0000503	0.0000509	0.0003	0.002	0.0168	0.00255
	February	0.0000752	0.0000753	0.0000758	0.0003	0.002	0.0251	0.00379
	March	0.0000852	0.0000852	0.0000853	0.0003	0.002	0.0284	0.00426
	April	0.0000503	0.0000502	0.0000503	0.0003	0.002	0.0167	0.00252
	May	0.0000295	0.0000295	0.0000295	0.0003	0.002	0.0984	0.0148
	June	0.0000501	0.0000501	0.0000501	0.0003	0.002	0.0167	0.00250
	July	0.0000130	0.0000130	0.0000130	0.0003	0.002	0.0434	0.00651
	August	0.0000500	0.0000501	0.0000502	0.0003	0.002	0.0167	0.00251
	September	0.0000850	0.0000851	0.0000853	0.0003	0.002	0.0284	0.00426
	October	0.0000500	0.0000501	0.0000502	0.0003	0.002	0.0167	0.00251
	November	0.0000500	0.0000503	0.0000508	0.0003	0.002	0.0168	0.00254
	December	0.0000500	0.0000504	0.0000513	0.0003	0.002	0.0168	0.00257
Operations (2018-2042)	January	0.0000500	0.0000509	0.0000582	0.0003	0.002	0.0170	0.00291
	February	0.0000752	0.0000762	0.0000859	0.0003	0.002	0.0254	0.00429
	March	0.0000851	0.0000861	0.0000947	0.0003	0.002	0.0287	0.00474
	April	0.0000500	0.0000505	0.0000538	0.0003	0.002	0.0168	0.00269
	May	0.0000295	0.0000295	0.0000296	0.0003	0.002	0.0984	0.0148
	June	0.0000500	0.0000502	0.0000507	0.0003	0.002	0.0167	0.00254
	July	0.0000130	0.0000130	0.0000131	0.0003	0.002	0.0434	0.00657
	August	0.0000500	0.0000503	0.0000520	0.0003	0.002	0.0168	0.00260
	September	0.0000850	0.0000854	0.0000883	0.0003	0.002	0.0285	0.00442
	October	0.0000500	0.0000503	0.0000522	0.0003	0.002	0.0168	0.00261
	November	0.0000500	0.0000509	0.0000580	0.0003	0.002	0.0170	0.00290
	December	0.0000500	0.0000515	0.0000621	0.0003	0.002	0.0172	0.00310
Closure (2043-2060)	January	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	February	0.0000750	0.0000750	0.0000750	0.0003	0.002	0.0250	0.00375
	March	0.0000850	0.0000850	0.0000850	0.0003	0.002	0.0283	0.00425
	April	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	May	0.0000295	0.0000295	0.0000295	0.0003	0.002	0.0983	0.0148
	June	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	July	0.0000130	0.0000130	0.0000130	0.0003	0.002	0.0433	0.00650
	August	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	September	0.0000850	0.0000850	0.0000850	0.0003	0.002	0.0283	0.00425
	October	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	November	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250
	December	0.0000500	0.0000500	0.0000500	0.0003	0.002	0.0167	0.00250

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7u. Murray River (MR7) Hazard Quotients for Total Uranium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Total Uranium Concentration			BC MOE Working Guideline	Canadian DWQG	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. Canadian DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000324	0.000324	0.000324	0.3	0.02	0.00108	0.0162
	February	0.000334	0.000335	0.000335	0.3	0.02	0.00112	0.0168
	March	0.000345	0.000346	0.000346	0.3	0.02	0.00115	0.0173
	April	0.000337	0.000337	0.000337	0.3	0.02	0.00112	0.0169
	May	0.000221	0.000221	0.000221	0.3	0.02	0.000737	0.0111
	June	0.000147	0.000147	0.000147	0.3	0.02	0.000490	0.00735
	July	0.000177	0.000177	0.000177	0.3	0.02	0.000590	0.00885
	August	0.000201	0.000201	0.000201	0.3	0.02	0.000670	0.0101
	September	0.000170	0.000170	0.000170	0.3	0.02	0.000567	0.00851
	October	0.000203	0.000203	0.000203	0.3	0.02	0.000677	0.0102
	November	0.000281	0.000281	0.000281	0.3	0.02	0.000938	0.0141
	December	0.000286	0.000286	0.000287	0.3	0.02	0.000955	0.0143
Operations (2018-2042)	January	0.000324	0.000324	0.000325	0.3	0.02	0.00108	0.0163
	February	0.000335	0.000335	0.000336	0.3	0.02	0.00112	0.0168
	March	0.000346	0.000346	0.000347	0.3	0.02	0.00116	0.0174
	April	0.000337	0.000337	0.000338	0.3	0.02	0.00113	0.0169
	May	0.000221	0.000221	0.000222	0.3	0.02	0.000739	0.0111
	June	0.000147	0.000147	0.000147	0.3	0.02	0.000491	0.00736
	July	0.000177	0.000177	0.000177	0.3	0.02	0.000591	0.00887
	August	0.000201	0.000201	0.000201	0.3	0.02	0.000671	0.0101
	September	0.000170	0.000170	0.000171	0.3	0.02	0.000569	0.00853
	October	0.000203	0.000203	0.000203	0.3	0.02	0.000678	0.0102
	November	0.000281	0.000281	0.000283	0.3	0.02	0.000942	0.0141
	December	0.000286	0.000287	0.000288	0.3	0.02	0.000961	0.0144
Closure (2043-2060)	January	0.000324	0.000324	0.000324	0.3	0.02	0.00108	0.0162
	February	0.000335	0.000335	0.000335	0.3	0.02	0.00112	0.017
	March	0.000346	0.000346	0.000346	0.3	0.02	0.00115	0.017
	April	0.000337	0.000337	0.000337	0.3	0.02	0.00112	0.0169
	May	0.000221	0.000221	0.000221	0.3	0.02	0.000737	0.0111
	June	0.000147	0.000147	0.000147	0.3	0.02	0.000490	0.00735
	July	0.000177	0.000177	0.000177	0.3	0.02	0.000590	0.00885
	August	0.000201	0.000201	0.000201	0.3	0.02	0.000670	0.0101
	September	0.000170	0.000170	0.000170	0.3	0.02	0.000567	0.00850
	October	0.000203	0.000203	0.000203	0.3	0.02	0.000677	0.0102
	November	0.000281	0.000281	0.000281	0.3	0.02	0.000937	0.0141
	December	0.000286	0.000286	0.000286	0.3	0.02	0.000953	0.0143

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7v. Murray River (MR7) Hazard Quotients for Total Vanadium, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Hazard Quotient relative to Aquatic Life Guideline	
		Total Vanadium Concentration			BC MOE Working Guideline	BC MOE Working Secondary Chronic Value Guideline	Maximum Predicted vs. BC MOE Working Guideline	Maximum Predicted vs. BC MOE Working Secondary Chronic Value Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.000500	0.000500	0.000501	0.006	0.02	0.0834	0.0250
	February	0.000500	0.000500	0.000501	0.006	0.02	0.0835	0.0250
	March	0.000500	0.000500	0.000501	0.006	0.02	0.0834	0.0250
	April	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	May	0.00335	0.00335	0.00335	0.006	0.02	0.558	0.167
	June	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	July	0.00140	0.00140	0.00140	0.006	0.02	0.233	0.0700
	August	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	September	0.00100	0.00100	0.00100	0.006	0.02	0.167	0.0500
	October	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	November	0.000500	0.000500	0.000500	0.006	0.02	0.0834	0.0250
	December	0.000500	0.000500	0.000501	0.006	0.02	0.0834	0.0250
Operations (2018-2042)	January	0.000500	0.000500	0.000504	0.006	0.02	0.0841	0.0252
	February	0.000500	0.000501	0.000506	0.006	0.02	0.0843	0.0253
	March	0.000500	0.000500	0.000505	0.006	0.02	0.0841	0.0252
	April	0.000499	0.000500	0.000501	0.006	0.02	0.0835	0.0250
	May	0.00335	0.00335	0.00335	0.006	0.02	0.558	0.168
	June	0.000500	0.000500	0.000500	0.006	0.02	0.0834	0.0250
	July	0.00140	0.00140	0.00140	0.006	0.02	0.233	0.0700
	August	0.000500	0.000500	0.000501	0.006	0.02	0.0835	0.0250
	September	0.00100	0.00100	0.00100	0.006	0.02	0.167	0.0501
	October	0.000500	0.000500	0.000501	0.006	0.02	0.0835	0.0250
	November	0.000500	0.000500	0.000504	0.006	0.02	0.0839	0.0252
	December	0.000500	0.000500	0.000505	0.006	0.02	0.0842	0.0253
Closure (2043-2060)	January	0.000500	0.000500	0.00050	0.006	0.02	0.0833	0.0250
	February	0.000500	0.000500	0.00050	0.006	0.02	0.0833	0.0250
	March	0.000500	0.000500	0.00050	0.006	0.02	0.0833	0.0250
	April	0.000500	0.000500	0.000500	0.006	0.02	0.0834	0.0250
	May	0.00335	0.00335	0.00335	0.006	0.02	0.558	0.168
	June	0.000500	0.000500	0.000500	0.006	0.02	0.0834	0.0250
	July	0.00140	0.00140	0.00140	0.006	0.02	0.233	0.0700
	August	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	September	0.00100	0.00100	0.00100	0.006	0.02	0.167	0.0500
	October	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	November	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250
	December	0.000500	0.000500	0.000500	0.006	0.02	0.0833	0.0250

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7w. Murray River (MR7) Hazard Quotients for Total Zinc, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Total Zinc Concentration			BC MOE 30-Day Mean Guideline	BC MOE Maximum Guideline	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00150	0.00150	0.00150	0.0600	0.0855	0.0250	0.0176
	February	0.00150	0.00150	0.00150	0.0754	0.101	0.0199	0.0149
	March	0.00255	0.00255	0.00255	0.0731	0.0986	0.0349	0.0259
	April	0.00150	0.00150	0.00150	0.0683	0.0938	0.0220	0.0160
	May	0.00745	0.00745	0.00745	0.0232	0.0487	0.321	0.153
	June	0.00150	0.00150	0.00150	0.00750	0.0330	0.200	0.0455
	July	0.00340	0.00340	0.00340	0.00754	0.0330	0.451	0.103
	August	0.00150	0.00150	0.00150	0.00750	0.0330	0.200	0.0455
	September	0.00250	0.00250	0.00250	0.00750	0.0330	0.333	0.0758
	October	0.00150	0.00150	0.00150	0.0368	0.0623	0.0408	0.0241
	November	0.00150	0.00150	0.00150	0.0383	0.0638	0.0392	0.0236
	December	0.00150	0.00150	0.00150	0.0525	0.0780	0.0286	0.0193
Operations (2018-2042)	January	0.00150	0.00150	0.00152	0.0600	0.0855	0.0250	0.0178
	February	0.00150	0.00151	0.00154	0.0754	0.101	0.0200	0.0152
	March	0.00255	0.00255	0.00258	0.0731	0.0986	0.0349	0.0261
	April	0.00150	0.00150	0.00151	0.0683	0.0938	0.0220	0.0161
	May	0.00745	0.00745	0.00745	0.0232	0.0487	0.321	0.153
	June	0.00150	0.00150	0.00150	0.00750	0.0330	0.200	0.0455
	July	0.00340	0.00340	0.00340	0.00754	0.0330	0.451	0.103
	August	0.00150	0.00150	0.00151	0.00750	0.0330	0.200	0.0457
	September	0.00250	0.00250	0.00251	0.00750	0.0330	0.334	0.0761
	October	0.00150	0.00150	0.00151	0.0368	0.0623	0.0408	0.0242
	November	0.00150	0.00150	0.00153	0.0383	0.0638	0.0393	0.0239
	December	0.00150	0.00150	0.00154	0.0525	0.0780	0.0287	0.0197
Closure (2043-2060)	January	0.00150	0.00150	0.00150	0.0600	0.0855	0.0250	0.0176
	February	0.00150	0.00150	0.00150	0.0754	0.101	0.0199	0.0149
	March	0.00255	0.00255	0.00255	0.0731	0.0986	0.0349	0.0259
	April	0.00150	0.00150	0.00150	0.0683	0.0938	0.0220	0.0160
	May	0.00745	0.00745	0.00745	0.0232	0.0487	0.321	0.153
	June	0.00150	0.00150	0.00150	0.00750	0.0330	0.200	0.0455
	July	0.00340	0.00340	0.00340	0.00754	0.0330	0.451	0.103
	August	0.00150	0.00150	0.00150	0.00750	0.0330	0.200	0.0455
	September	0.00250	0.00250	0.00250	0.00750	0.0330	0.333	0.0758
	October	0.00150	0.00150	0.00150	0.0368	0.0623	0.0408	0.0241
	November	0.00150	0.00150	0.00150	0.0383	0.0638	0.0392	0.0235
	December	0.00150	0.00150	0.00150	0.0525	0.0780	0.0286	0.0192

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7x. Murray River (MR7) Hazard Quotients for Chloride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Chloride Concentration			BC MOE 30-Day Mean	BC MOE Maximum	
		Median	Mean	Maximum			
Construction (2015-2017)	January	1.82	1.82	1.83	150	600	600
	February	1.64	1.64	1.64	150	600	600
	March	2.01	2.02	2.02	150	600	600
	April	1.81	1.80	1.81	150	600	600
	May	0.252	0.251	0.252	150	600	600
	June	0.251	0.251	0.252	150	600	600
	July	0.251	0.251	0.252	150	600	600
	August	0.611	0.611	0.613	150	600	600
	September	0.527	0.527	0.529	150	600	600
	October	0.681	0.682	0.684	150	600	600
	November	1.17	1.18	1.18	150	600	600
	December	1.20	1.20	1.21	150	600	600
Operations (2018-2042)	January	1.81	1.83	1.95	150	600	600
	February	1.63	1.65	1.81	150	600	600
	March	2.01	2.03	2.17	150	600	600
	April	1.80	1.81	1.86	150	600	600
	May	0.254	0.256	0.267	150	600	600
	June	0.251	0.253	0.263	150	600	600
	July	0.250	0.253	0.273	150	600	600
	August	0.610	0.615	0.645	150	600	600
	September	0.525	0.532	0.582	150	600	600
	October	0.680	0.685	0.718	150	600	600
	November	1.17	1.19	1.31	150	600	600
	December	1.19	1.22	1.39	150	600	600
Closure (2043-2060)	January	1.81	1.81	1.81	150	600	600
	February	1.63	1.63	1.63	150	600	600
	March	2.01	2.01	2.01	150	600	600
	April	1.80	1.80	1.80	150	600	600
	May	0.250	0.250	0.250	150	600	600
	June	0.250	0.250	0.250	150	600	600
	July	0.250	0.250	0.250	150	600	600
	August	0.610	0.610	0.610	150	600	600
	September	0.525	0.525	0.525	150	600	600
	October	0.680	0.680	0.680	150	600	600
	November	1.17	1.17	1.17	150	600	600
	December	1.19	1.19	1.19	150	600	600

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7x. Murray River (MR7) Hazard Quotients for Chloride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply
		Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0121	0.00304	0.00304
	February	0.0109	0.00274	0.00274
	March	0.0134	0.00336	0.00336
	April	0.0120	0.00301	0.00301
	May	0.00168	0.000420	0.000420
	June	0.00167	0.000419	0.000419
	July	0.00167	0.000420	0.000420
	August	0.00408	0.00102	0.00102
	September	0.00351	0.000882	0.000882
	October	0.00454	0.00114	0.00114
	November	0.00784	0.00197	0.00197
	December	0.00800	0.00202	0.00202
Operations (2018-2042)	January	0.0122	0.00325	0.00325
	February	0.0110	0.00302	0.00302
	March	0.0135	0.00362	0.00362
	April	0.0121	0.00311	0.00311
	May	0.00171	0.000445	0.000445
	June	0.00169	0.000438	0.000438
	July	0.00169	0.000455	0.000455
	August	0.00410	0.00108	0.00108
	September	0.00355	0.000970	0.000970
	October	0.00457	0.00120	0.00120
	November	0.00792	0.00218	0.00218
	December	0.00811	0.00232	0.00232
Closure (2043-2060)	January	0.0121	0.00302	0.00302
	February	0.0109	0.00272	0.00272
	March	0.0134	0.00335	0.00335
	April	0.0120	0.00300	0.00300
	May	0.00167	0.000417	0.000417
	June	0.00167	0.000417	0.000417
	July	0.00167	0.000417	0.000417
	August	0.00407	0.00102	0.00102
	September	0.00350	0.000875	0.000875
	October	0.00453	0.00113	0.00113
	November	0.00780	0.00195	0.00195
	December	0.00793	0.00198	0.00198

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7y. Murray River (MR7) Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹	Drinking Water Quality Guidelines		BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Fluoride Concentration				BC MOE Maximum Guideline	BC Maximum DWQG	BC 30-Day Mean DWQG	30-Day Mean
		Median	Mean	Maximum					
Construction (2015-2017)	January	0.0556	0.0556	0.0556	1.52	1.5	1	1	1.5
	February	0.0596	0.0596	0.0596	1.57	1.5	1	1	1.5
	March	0.0555	0.0555	0.0556	1.56	1.5	1	1	1.5
	April	0.0570	0.0570	0.0570	1.55	1.5	1	1	1.5
	May	0.0355	0.0355	0.0355	1.38	1.5	1	1	1.5
	June	0.0320	0.0320	0.0320	1.26	1.5	1	1	1.5
	July	0.0360	0.0360	0.0360	1.29	1.5	1	1	1.5
	August	0.0350	0.0350	0.0350	1.19	1.5	1	1	1.5
	September	0.0325	0.0325	0.0325	1.28	1.5	1	1	1.5
	October	0.0390	0.0390	0.0390	1.44	1.5	1	1	1.5
	November	0.0451	0.0451	0.0451	1.44	1.5	1	1	1.5
	December	0.0481	0.0481	0.0481	1.50	1.5	1	1	1.5
Operations (2018-2042)	January	0.0556	0.0557	0.0569	1.52	1.5	1	1	1.5
	February	0.0596	0.0598	0.0613	1.57	1.5	1	1	1.5
	March	0.0556	0.0557	0.0571	1.56	1.5	1	1	1.5
	April	0.0570	0.0571	0.0577	1.55	1.5	1	1	1.5
	May	0.0356	0.0356	0.0357	1.38	1.5	1	1	1.5
	June	0.0320	0.0320	0.0321	1.26	1.5	1	1	1.5
	July	0.0360	0.0360	0.0362	1.29	1.5	1	1	1.5
	August	0.0350	0.0351	0.0354	1.19	1.5	1	1	1.5
	September	0.0325	0.0326	0.0331	1.28	1.5	1	1	1.5
	October	0.0390	0.0391	0.0394	1.44	1.5	1	1	1.5
	November	0.0450	0.0452	0.0464	1.44	1.5	1	1	1.5
	December	0.0481	0.0483	0.0500	1.50	1.5	1	1	1.5
Closure (2043-2060)	January	0.0555	0.0555	0.0555	1.52	1.5	1	1	1.5
	February	0.0595	0.0595	0.0595	1.57	1.5	1	1	1.5
	March	0.0555	0.0555	0.0555	1.56	1.5	1	1	1.5
	April	0.0570	0.0570	0.0570	1.55	1.5	1	1	1.5
	May	0.0355	0.0355	0.0355	1.38	1.5	1	1	1.5
	June	0.0320	0.0320	0.0320	1.26	1.5	1	1	1.5
	July	0.0360	0.0360	0.0360	1.29	1.5	1	1	1.5
	August	0.0350	0.0350	0.0350	1.19	1.5	1	1	1.5
	September	0.0325	0.0325	0.0325	1.28	1.5	1	1	1.5
	October	0.0390	0.0390	0.0390	1.44	1.5	1	1	1.5
	November	0.0450	0.0450	0.0450	1.44	1.5	1	1	1.5
	December	0.0480	0.0480	0.0480	1.50	1.5	1	1	1.5

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7y. Murray River (MR7) Hazard Quotients for Fluoride, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines		Hazard Quotient relative to BC MOE Working Water Quality Guidelines for Wildlife Water Supply	
		Maximum Predicted vs. BC MOE Maximum Guideline	Maximum Predicted vs. BC Maximum DWQG	Mean Predicted vs. BC 30-Day Mean DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC MOE Maximum Guideline
Construction (2015-2017)	January	0.0365	0.0371	0.0556	0.0556	0.0371
	February	0.0379	0.0397	0.0556	0.0596	0.0397
	March	0.0355	0.0371	0.0596	0.0555	0.0371
	April	0.0368	0.0380	0.0555	0.0570	0.0380
	May	0.0258	0.0237	0.0570	0.0355	0.0237
	June	0.0254	0.0213	0.0355	0.0320	0.0213
	July	0.0279	0.0240	0.0320	0.0360	0.0240
	August	0.0293	0.0233	0.0360	0.0350	0.0233
	September	0.0254	0.0217	0.0350	0.0325	0.0217
	October	0.0272	0.0260	0.0325	0.0390	0.0260
	November	0.0313	0.0301	0.0390	0.0451	0.0301
	December	0.0322	0.0321	0.0481	0.0481	0.0321
Operations (2018-2042)	January	0.0373	0.0379	0.0557	0.0557	0.0379
	February	0.0390	0.0409	0.0557	0.0598	0.0409
	March	0.0365	0.0381	0.0598	0.0557	0.0381
	April	0.0372	0.0384	0.0557	0.0571	0.0384
	May	0.0260	0.0238	0.0571	0.0356	0.0238
	June	0.0255	0.0214	0.0356	0.0320	0.0214
	July	0.0280	0.0242	0.0320	0.0360	0.0242
	August	0.0296	0.0236	0.0360	0.0351	0.0236
	September	0.0258	0.0220	0.0351	0.0326	0.0220
	October	0.0274	0.0263	0.0326	0.0391	0.0263
	November	0.0321	0.0309	0.0391	0.0452	0.0309
	December	0.0334	0.0334	0.0500	0.0483	0.0334
Closure (2043-2060)	January	0.0364	0.0370	0.0555	0.0555	0.0370
	February	0.0379	0.0397	0.0555	0.0595	0.0397
	March	0.0355	0.0370	0.0595	0.0555	0.0370
	April	0.0368	0.0380	0.0555	0.0570	0.0380
	May	0.0258	0.0237	0.0570	0.0355	0.0237
	June	0.0254	0.0213	0.0355	0.0320	0.0213
	July	0.0279	0.0240	0.0320	0.0360	0.0240
	August	0.0293	0.0233	0.0360	0.0350	0.0233
	September	0.0254	0.0217	0.0350	0.0325	0.0217
	October	0.0272	0.0260	0.0325	0.0390	0.0260
	November	0.0312	0.0300	0.0390	0.0450	0.0300
	December	0.0321	0.0320	0.0480	0.0480	0.0320

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent

Appendix 8-G7z. Murray River (MR7) Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines		Drinking Water Quality Guidelines
		Nitrate Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.106	0.0709	0.106	3	32.8	10
	February	0.0878	0.0880	0.0882	3	32.8	10
	March	0.0888	0.0889	0.0891	3	32.8	10
	April	0.0689	0.0689	0.0690	3	32.8	10
	May	0.0920	0.0920	0.0921	3	32.8	10
	June	0.0406	0.0406	0.0406	3	32.8	10
	July	0.0137	0.0137	0.0137	3	32.8	10
	August	0.0112	0.0112	0.0113	3	32.8	10
	September	0.0181	0.0181	0.0182	3	32.8	10
	October	0.0364	0.0364	0.0365	3	32.8	10
	November	0.0747	0.0748	0.0750	3	32.8	10
	December	0.101	0.101	0.101	3	32.8	10
Operations (2018-2042)	January	0.106	0.0637	0.107	3	32.8	10
	February	0.0880	0.0880	0.0882	3	32.8	10
	March	0.0889	0.0889	0.0891	3	32.8	10
	April	0.0689	0.0689	0.0690	3	32.8	10
	May	0.0920	0.0920	0.0921	3	32.8	10
	June	0.0406	0.0244	0.0406	3	32.8	10
	July	0.0137	0.0137	0.0137	3	32.8	10
	August	0.0112	0.0112	0.0112	3	32.8	10
	September	0.0181	0.0181	0.0181	3	32.8	10
	October	0.0364	0.0364	0.0364	3	32.8	10
	November	0.0748	0.0748	0.0749	3	32.8	10
	December	0.101	0.101	0.101	3	32.8	10
Closure (2043-2060)	January	0.106	0.106	0.106	3	32.8	10
	February	0.0879	0.0879	0.0879	3	32.8	10
	March	0.0888	0.0888	0.0888	3	32.8	10
	April	0.0689	0.0689	0.0689	3	32.8	10
	May	0.0920	0.0920	0.0920	3	32.8	10
	June	0.0406	0.0406	0.0406	3	32.8	10
	July	0.0137	0.0137	0.0137	3	32.8	10
	August	0.0112	0.0112	0.0112	3	32.8	10
	September	0.0181	0.0181	0.0181	3	32.8	10
	October	0.0364	0.0364	0.0364	3	32.8	10
	November	0.0747	0.0747	0.0747	3	32.8	10
	December	0.101	0.101	0.101	3	32.8	10

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7z. Murray River (MR7) Hazard Quotients for Nitrate, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs BC MOE 30-Day Mean	Maximum Predicted vs BC MOE Maximum	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0236	0.00325	0.0106
	February	0.0293	0.00269	0.00882
	March	0.0296	0.00272	0.00891
	April	0.0230	0.00210	0.00690
	May	0.0307	0.00281	0.00921
	June	0.0135	0.00124	0.00406
	July	0.00457	0.000419	0.00137
	August	0.00374	0.000343	0.00113
	September	0.00603	0.000554	0.00182
	October	0.0121	0.00111	0.00365
	November	0.0249	0.00229	0.00750
	December	0.0337	0.00309	0.0101
Operations (2018-2042)	January	0.0212	0.00325	0.0107
	February	0.0293	0.00269	0.00882
	March	0.0296	0.00272	0.00891
	April	0.0230	0.00210	0.00690
	May	0.0307	0.00281	0.00921
	June	0.00812	0.00124	0.00406
	July	0.00457	0.000418	0.00137
	August	0.00373	0.000342	0.00112
	September	0.00602	0.000551	0.00181
	October	0.0121	0.001110	0.00364
	November	0.0249	0.00228	0.00749
	December	0.0337	0.00309	0.0101
Closure (2043-2060)	January	0.0354	0.00324	0.0106
	February	0.0293	0.00268	0.00879
	March	0.0296	0.00271	0.00888
	April	0.0230	0.00210	0.00689
	May	0.0307	0.00281	0.00920
	June	0.0135	0.00124	0.00406
	July	0.00457	0.000418	0.00137
	August	0.00373	0.000341	0.00112
	September	0.00602	0.000550	0.00181
	October	0.0121	0.00111	0.00364
	November	0.0249	0.00228	0.00747
	December	0.0337	0.00308	0.0101

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

Appendix 8-G7aa. Murray River (MR7) Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Drinking Water Quality Guidelines
		Nitrite Concentration			BC MOE 30-Day Mean	BC MOE Maximum	BC DWQG
		Median	Mean	Maximum			
Construction (2015-2017)	January	0.000504	0.000505	0.000509	0.02	0.06	1
	February	0.000501	0.000504	0.000512	0.02	0.06	1
	March	0.000500	0.000504	0.000511	0.04	0.12	1
	April	0.000500	0.000501	0.000503	0.02	0.06	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.02	0.06	1
	July	0.000500	0.000500	0.000501	0.02	0.06	1
	August	0.000500	0.000501	0.000502	0.02	0.06	1
	September	0.000500	0.000501	0.000504	0.02	0.06	1
	October	0.000500	0.000501	0.000502	0.02	0.06	1
	November	0.000501	0.000503	0.000509	0.02	0.06	1
	December	0.000501	0.000505	0.000514	0.02	0.06	1
Operations (2018-2042)	January	0.000501	0.000502	0.000509	0.02	0.06	1
	February	0.000501	0.000502	0.000510	0.02	0.06	1
	March	0.000501	0.000502	0.000509	0.04	0.12	1
	April	0.000500	0.000501	0.000503	0.02	0.06	1
	May	0.000500	0.000500	0.000501	0.02	0.06	1
	June	0.000500	0.000500	0.000501	0.02	0.06	1
	July	0.000500	0.000500	0.000501	0.02	0.06	1
	August	0.000500	0.000500	0.000502	0.02	0.06	1
	September	0.000500	0.000501	0.000503	0.02	0.06	1
	October	0.000500	0.000500	0.000502	0.02	0.06	1
	November	0.000501	0.000501	0.000507	0.02	0.06	1
	December	0.000501	0.000502	0.000511	0.02	0.06	1
Closure (2043-2060)	January	0.000500	0.000500	0.000500	0.02	0.06	1
	February	0.000500	0.000500	0.000500	0.02	0.06	1
	March	0.000500	0.000500	0.000500	0.04	0.12	1
	April	0.000500	0.000500	0.000500	0.02	0.06	1
	May	0.000500	0.000500	0.000500	0.02	0.06	1
	June	0.000500	0.000500	0.000500	0.02	0.06	1
	July	0.000500	0.000500	0.000500	0.02	0.06	1
	August	0.000500	0.000500	0.000500	0.02	0.06	1
	September	0.000500	0.000500	0.000500	0.02	0.06	1
	October	0.000500	0.000500	0.000500	0.02	0.06	1
	November	0.000500	0.000500	0.000500	0.02	0.06	1
	December	0.000500	0.000500	0.000500	0.02	0.06	1

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are chloride dependent

Appendix 8-G7aa. Murray River (MR7) Hazard Quotients for Nitrite, Base Case

Project Phase	Month	Hazard Quotient relative to Aquatic Life Guideline		Hazard Quotient relative to Drinking Water Quality Guidelines
		Mean Predicted vs BC MOE 30-Day Mean	Maximum Predicted vs BC MOE Maximum	Maximum Predicted vs. BC DWQG
Construction (2015-2017)	January	0.0252	0.00849	0.000509
	February	0.0252	0.00853	0.000512
	March	0.0126	0.00426	0.000511
	April	0.0251	0.00839	0.000503
	May	0.0250	0.00834	0.000500
	June	0.0250	0.00834	0.000500
	July	0.0250	0.00835	0.000501
	August	0.0250	0.00837	0.000502
	September	0.0251	0.00840	0.000504
	October	0.0250	0.00837	0.000502
	November	0.0252	0.00848	0.000509
	December	0.0253	0.00857	0.000514
Operations (2018-2042)	January	0.0251	0.00849	0.000509
	February	0.0251	0.00850	0.000510
	March	0.0125	0.00424	0.000509
	April	0.0250	0.00839	0.000503
	May	0.0250	0.00835	0.000501
	June	0.0250	0.00834	0.000501
	July	0.0250	0.00835	0.000501
	August	0.0250	0.00836	0.000502
	September	0.0250	0.00838	0.000503
	October	0.0250	0.00837	0.000502
	November	0.0251	0.00845	0.000507
	December	0.0251	0.00851	0.000511
Closure (2043-2060)	January	0.0250	0.00833	0.000500
	February	0.0250	0.00833	0.000500
	March	0.0125	0.00417	0.000500
	April	0.0250	0.00833	0.000500
	May	0.0250	0.00833	0.000500
	June	0.0250	0.00833	0.000500
	July	0.0250	0.00833	0.000500
	August	0.0250	0.00834	0.000500
	September	0.0250	0.00833	0.000500
	October	0.0250	0.00833	0.000500
	November	0.0250	0.00833	0.000500
	December	0.0250	0.00833	0.000500

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are chloride dependent

Appendix 8-G7ab. Murray River (MR7) Hazard Quotients for Ammonia, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹		Hazard Quotient relative to Aquatic Life Guideline	
		Ammonia Concentration			BC MOE 30-Day Mean	BC MOE Maximum	Mean Predicted vs BC MOE 30-Day Mean	Maximum Predicted vs BC MOE Maximum
		Median	Mean	Maximum				
Construction (2015-2017)	January	0.00266	0.00264	0.00269	0.491	3.61	0.00537	0.000744
	February	0.00265	0.00263	0.00270	0.491	3.61	0.00535	0.000748
	March	0.00256	0.00259	0.00268	0.491	3.61	0.00529	0.000743
	April	0.00746	0.00746	0.00747	0.491	3.61	0.0152	0.00207
	May	0.00252	0.00252	0.00252	0.491	3.61	0.00513	0.000699
	June	0.00251	0.00251	0.00252	0.491	3.61	0.00512	0.000698
	July	0.00252	0.00252	0.00253	0.491	3.61	0.00512	0.000700
	August	0.00253	0.00252	0.00254	0.491	3.61	0.00514	0.000704
	September	0.0120	0.0120	0.0120	0.491	3.61	0.0244	0.00333
	October	0.00254	0.00253	0.00254	0.491	3.61	0.00515	0.000704
	November	0.00265	0.00260	0.00266	0.491	3.61	0.00530	0.000737
	December	0.00273	0.00266	0.00276	0.491	3.61	0.00543	0.000764
Operations (2018-2042)	January	0.00250	0.00267	0.00404	0.491	3.61	0.00543	0.00112
	February	0.00251	0.00271	0.00452	0.491	3.61	0.00553	0.00125
	March	0.00250	0.00270	0.00432	0.491	3.61	0.00549	0.00120
	April	0.00740	0.00750	0.00812	0.491	3.61	0.0153	0.00225
	May	0.00255	0.00256	0.00267	0.491	3.61	0.00521	0.000740
	June	0.00251	0.00253	0.00264	0.491	3.61	0.00515	0.000730
	July	0.00250	0.00253	0.00275	0.491	3.61	0.00516	0.000763
	August	0.00250	0.00255	0.00289	0.491	3.61	0.00520	0.000800
	September	0.0120	0.0120	0.0126	0.491	3.61	0.0245	0.00348
	October	0.00250	0.00255	0.00292	0.491	3.61	0.00520	0.000808
	November	0.00250	0.00269	0.00401	0.491	3.61	0.00547	0.00111
	December	0.00250	0.00278	0.00476	0.491	3.61	0.00566	0.00132
Closure (2043-2060)	January	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	February	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	March	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	April	0.00740	0.00740	0.00740	0.491	3.61	0.0151	0.00205
	May	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	June	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	July	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	August	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	September	0.0119	0.0119	0.0119	0.491	3.61	0.0243	0.00331
	October	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	November	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693
	December	0.00250	0.00250	0.00250	0.491	3.61	0.00509	0.000693

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are pH and temperature dependent

Appendix 8-G7ac. Murray River (MR7) Hazard Quotients for Sulphate, Base Case

Project Phase	Month	Predicted Water Quality			Aquatic Life Guidelines ¹	Drinking Water Quality Guidelines	Hazard Quotient relative to Aquatic Life Guideline	Hazard Quotient relative to Drinking Water Quality Guidelines
		Sulphate Concentration			BC MOE 30-Day Mean Guideline	BC DWQG	Mean Predicted vs. BC MOE 30-Day Mean Guideline	Maximum Predicted vs. BC DWQG
		Median	Mean	Maximum				
Construction (2015-2017)	January	21.8	21.8	21.8	309	500	0.0706	0.0436
	February	22.2	22.2	22.2	429	500	0.0518	0.0445
	March	24.7	24.8	24.8	309	500	0.0801	0.0496
	April	22.5	22.5	22.5	309	500	0.0728	0.0450
	May	6.55	6.55	6.55	309	500	0.0212	0.0131
	June	6.00	6.00	6.00	309	500	0.0194	0.0120
	July	8.89	8.89	8.89	309	500	0.0288	0.0178
	August	8.62	8.62	8.62	218	500	0.0395	0.0172
	September	9.28	9.28	9.29	309	500	0.0300	0.0186
	October	12.1	12.1	12.1	309	500	0.0392	0.0242
	November	17.1	17.1	17.1	309	500	0.0554	0.0342
	December	16.5	16.5	16.5	309	500	0.0534	0.0331
Operations (2018-2042)	January	21.8	21.8	21.9	309	500	0.0706	0.0437
	February	22.2	22.2	22.3	429	500	0.0518	0.0446
	March	24.8	24.8	24.8	309	500	0.0802	0.0496
	April	22.5	22.5	22.5	309	500	0.0728	0.0450
	May	6.55	6.55	6.56	309	500	0.0212	0.0131
	June	6.00	6.00	6.01	309	500	0.0194	0.0120
	July	8.89	8.89	8.90	309	500	0.0288	0.0178
	August	8.62	8.62	8.63	218	500	0.0395	0.0173
	September	9.28	9.28	9.29	309	500	0.0300	0.0186
	October	12.1	12.1	12.1	309	500	0.0392	0.0242
	November	17.1	17.1	17.1	309	500	0.0554	0.0343
	December	16.5	16.5	16.5	309	500	0.0534	0.0331
Closure (2043-2060)	January	21.8	21.8	21.8	309	500	0.0706	0.0436
	February	22.2	22.2	22.2	429	500	0.0518	0.0444
	March	24.8	24.8	24.8	309	500	0.0801	0.0495
	April	22.5	22.5	22.5	309	500	0.0729	0.0450
	May	6.56	6.56	6.56	309	500	0.0212	0.0131
	June	6.01	6.01	6.01	309	500	0.0194	0.0120
	July	8.90	8.90	8.90	309	500	0.0288	0.0178
	August	8.63	8.63	8.63	218	500	0.0396	0.0173
	September	9.28	9.28	9.28	309	500	0.0300	0.0186
	October	12.1	12.1	12.1	309	500	0.0392	0.0242
	November	17.1	17.1	17.1	309	500	0.0554	0.0342
	December	16.5	16.5	16.5	309	500	0.0534	0.0330

Notes:

All concentrations in mg/L.

Grey shading indicates a hazard quotient > 1.0

BC MOE = British Columbia Ministry of Environment

DWQG = Drinking water quality guideline

¹ Guidelines are hardness dependent