

Appendix 8: 2019 Surface Water Chemistry Analysis Results

Surface Water Standard Water Analysis + Total Metals									
Sample Description		CCME Guideline FWAL		Ray Brook Downstream	Ray Brook Downstream	Wetland #1 Outflow	Wetland #1 Outflow	Wetland #3 Outflow	Wetland #3 Outflow
Date Sampled				05/08/2019	10/24/2019	05/08/2019	10/24/2019	05/08/2019	10/24/2019
Parameter	Unit		RDL	182132	649268	182134	649273	182136	649274
pH		6.5-9.0		7.75	7.76	6.38	6.38	6.01	5.85
Reactive Silica as SiO ₂	mg/L		0.5	8.4	9.8	6.3	8.1	3.9	5.2
Chloride	mg/L	640, 120	1	5	<1	3	10	4	10
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	3	<2	<2	2	<2	<2
Alkalinity	mg/L		5	47	45	6	<5	<5	<5
True Color	TCU	Narrative	5	22	28	57	77	75	82
Turbidity	NTU	8,2	0.1	3.2	8.1	1.2	1.0	1.4	0.5
Electrical Conductivity	umho/cm		1	109	127	34	59	30	48
Nitrate + Nitrite as N	mg/L		0.05	0.11	0.08	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	550, 13	0.05	0.11	0.08	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	Fact Sheet	0.03	1.22	0.22	0.06	0.11	0.06	0.09
Total Organic Carbon	mg/L		0.5	2.9	5.7	7.1	14.8	6.3	14.8
Ortho-Phosphate as P	mg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	6.4	8.1	3.5	4.7	3.5	4.6
Total Potassium	mg/L		0.1	0.3	0.7	0.1	0.8	0.1	0.5
Total Calcium	mg/L		0.1	12.6	13.1	1.7	3.1	1.0	2.0
Total Magnesium	mg/L		0.1	1.7	2.2	0.9	1.4	0.6	1.0
Bicarb. Alkalinity (as CaCO ₃)	mg/L		5	47	45	6	<5	<5	<5
Carb. Alkalinity (as CaCO ₃)	mg/L		10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5

Calculated TDS	mg/L		1	60	53	13	22	10	19
Hardness	mg/L			38.5	41.8	8.0	13.5	5.0	9.1
Langelier Index (@20C)	NA			-1.04	-1.03	-4.11	-3.96	-4.80	-4.67
Langelier Index (@4C)	NA			-1.36	-1.35	-4.43	-4.28	-5.12	-4.99
Saturation pH (@20C)	NA			8.79	8.79	10.5	10.3	10.8	10.5
Saturation pH (@4C)	NA			9.11	9.11	10.8	10.7	11.1	10.8
Anion Sum	me/L			1.15	0.91	0.20	0.32	0.11	0.28
Cation sum	me/L			1.16	1.29	0.33	0.53	0.28	0.43
% Difference/ Ion Balance	%			0.4	17.5	24.0	24.2	43.1	21.1
Total Aluminum	ug/L	5 µg/L pH < 6.5, >100 µg/L pH ≥ 6.5	5	104	400	142	208	195	246
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	<2
Total Barium	ug/L		5	47	42	<5	<5	<5	<5
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L	29000, 1500	5	8	10	7	7	5	6
Total Cadmium	ug/L	1.0, 0.09	0.09	<0.09	<0.017	<0.09	0.017	<0.09	<0.017
Total Chromium	ug/L		1	<1		1	<1	<1	<1
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L	Equation	1	<1		2	<1	1	<1
Total Iron	ug/L	300	50	177	665	<50	103	83	75
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Manganese	ug/L		2	6	14	4	10	8	18
Total Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L	Equation	2	<2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.03	<0.02	<0.02	<0.02	<0.02
Total Selenium	ug/L	1	1	<1		1	<1	<1	<1

Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Total Strontium	ug/L		5	33	38	8	16	5	10
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		2	2	10	<2	2	<2	<2
Total Uranium	ug/L	33, 15	0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
Total Vanadium	ug/L		2	3	3	<2	<2	<2	<2
Total Zinc	ug/L	37,7	5	<5	<5	<5	<5	<5	<5