

Appendix V

Laboratory Analytical Results

Table 17J.1 Water Quality Laboratory Analytical Results for Routine Monitoring Stations from October 2011 and March 2012 Visits

Parameter	Units	RDL	CWQG Guideline	MMER Guideline	S1				S2				S3				S4				S5				L1				L2		Long Lake 2-Mar-12
					8-Oct-11	Lab. Dup.	2-Mar-12	Lab. Dup.		7-Oct-11	Lab. Dup.	2-Mar-12	Lab. Dup.		8-Oct-11	2-Mar-12	Lab. Dup.		7-Oct-11	2-Mar-12	Lab. Dup.		8-Oct-11	Lab. Dup.	2-Mar-12		7-Oct-11	2-Mar-12	Lab. Dup.		
Anion Sum	me/L	N/A			0.67		1.06			1.21		1.75		0.55	0.960		0.61	0.690			1.79		2.32		0.68	0.710		1.83		0.81	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			33		49			56		78		27	42		28	32			86		110		34	33		88		37	
Calculated TDS	mg/L	1			38		58.0			67		93.0		36	56.0		34	37.0			90		116		37	38.0		91		43	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			<1		<1.0			<1		<1.0		<1	<1.0		<1	<1.0			<1		1.2		<1	<1.0		<1		<1.0	
Cation Sum	me/L	N/A			0.76		0.970			1.23		1.57		0.65	0.890		0.65	0.630			1.84		2.22		0.76	0.670		1.85		0.76	
Hardness (CaCO3)	mg/L	1			34		43			56		69		29	40		29	29			89		110		36	31		90		36	
Ion Balance (% Difference)	%	N/A			6.29		4.43			0.82		5.42		8.33	3.78		3.17	4.55			1.38		2.20		5.56	2.90		0.54		3.18	
Langelier Index (@ 20C)	N/A				-1.34		-1.07			-0.54		-0.421		-1.53	-1.10		-1.36	-1.37			-0.075		0.152		-1.11	-1.19		-0.087		-1.08	
Langelier Index (@ 4C)	N/A				-1.59		-1.32			-0.792		-0.672		-1.61	-1.36		-1.61	-1.63			-0.326		-0.0990		-1.36	-1.45		-0.338		-1.33	
Nitrate (N)	mg/L	0.05	13		<0.05		0.27			<0.05		0.053		<0.05	0.080		<0.05	<0.050			<0.05		0.11		<0.05	<0.050		<0.05		0.11	
Saturation pH (@ 20C)	N/A				8.86		8.58			8.41		8.18		9.03	8.66		8.99	8.92			8.11		7.91		8.88	8.85		8.13		8.76	
Saturation pH (@ 4C)	N/A				9.11		8.83			8.66		8.43		9.28	8.92		9.24	9.18			8.36		8.16		9.13	9.11		8.38		9.01	
Acidity	mg/L	5			<5		5.6			<5		6.4		5	<5.0		<5	<5.0			<5	<5	<5.0		<5	<5.0		<5		<5.0	
Total Alkalinity (Total as CaCO3)	mg/L	5			33		49			56		78		27	43		29	32	31		87		110		34	33	32	89		38	
Dissolved Chloride (Cl)	mg/L	1			<1		<1.0			<1		2.2		<1	<1.0		<1	<1.0	<1.0		<1		<1.0		<1	<1.0	<1.0	<1		<1.0	
Colour	TCU	5	Narrative		23		22			20		11		44	14		13	12	11		13		7.9		10	11	10	12		9.9	
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	0.005 (as free CN)	2	<0.002		<0.0020		<0.002		<0.0020		<0.002	<0.0020		<0.002	<0.0020			<0.002		<0.0020		<0.002	<0.0020		<0.002		<0.0020		
Total Dissolved Solids	mg/L	10			47		64			64	54	82		46	48		31	32			81		110		34	27		100		30	
Dissolved Fluoride (F-)	mg/L	0.1	0.120 (inorganic F)		<0.1	<0.1	<0.10	<0.10		<0.1		0.11		<0.1	<0.10		<0.1	<0.10			<0.1		<0.10		<0.1	<0.10		<0.1		<0.10	
Nitrate + Nitrite	mg/L	0.05			<0.05		0.27			<0.05		0.053		<0.05	0.080		<0.05	<0.050	<0.050		<0.05		0.11		<0.05	<0.050	0.052	<0.05		0.11	
Nitrite (N)	mg/L	0.01	0.06		<0.01		<0.010			<0.01		<0.010		<0.01	<0.010		<0.01	<0.010	<0.010		<0.01		<0.010		<0.01	<0.010	<0.010	<0.01		<0.010	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	See Table		0.06		<0.050	<0.050		0.11		<0.050		0.08	<0.050		0.06	<0.050			0.16		<0.050		<0.05	<0.050	<0.050	<0.05		<0.050	
Dissolved Organic Carbon (C)	mg/L	0.5			5.3	5.4	5.0	4.8		3.7		3.5		6.7	2.5		3.2	3.3			3.2		1.5		3.1	3.3		3		3.2	
Total Organic Carbon (C)	mg/L	0.5			5		4.4	4.3		3.5		3.8		6.7	2.1		3.1	2.9			3		1.2		2.9	2.7		2.9		2.8	
Orthophosphate (P)	mg/L	0.01			<0.01		<0.010			<0.01		<0.010		<0.01	<0.010		<0.01	<0.010	<0.010		<0.01		<0.010		<0.01	<0.010	<0.010	0.01		<0.010	
pH	pH	N/A	6.5-9		7.52		7.51			7.87		7.76	7.78	7.5	7.56		7.63	7.55			8.03		8.06		7.77	7.66		8.04		7.68	
Total Phosphorus	mg/L				0.016		0.016			0.005		0.005		7.4	9.4		3.2	3.6	3.5		4.3		6.7		3.4	3.7	3.7	4.3		4	
Reactive Silica (SiO2)	mg/L	0.5			4.2		6.7			6.6		8.8		7.4	9.4		3.2	3.6	3.5		4.3		6.7		3.4	3.7	3.7	4.3		4	
Total Suspended Solids	mg/L	1	Narrative	30	2		2.7			1		<2.0		<1	5.2		1	2.4			<1		<1.0		1	1.6		2		<1.0	
Dissolved Sulphate (SO4)	mg/L	2			<2		2.7			4		5.4		<2	4.8		2	2.2	2.1		2		5.8		<2	2.2	2.3	2		2.3	
Turbidity	NTU	0.1	Narrative		0.2		0.60			0.1		1.3		0.2	0.70	0.78	0.1	0.37			<0.1		0.40		0.2	0.18		<0.1		0.61	
Conductivity	uS/cm	1			67		95			110		160	160	56	87		58	62			160		210		68	67		160		76	
Dissolved Mercury (Hg)	µg/L	0.01	0.026		<0.01	<0.01	<0.013	<0.013		0.01		<0.013		<0.01	<0.013		<0.01	<0.013			<0.01		<0.013		<0.01	<0.013		<0.01		<0.013	
Dissolved Aluminum (Al)	µg/L	5.0			14.3		12.9			10.3		7.8		79.8	22.1		17.9	11.5	12.1		<5		<5.0		16.1	<5.0		12.3		7.2	
Total Aluminum (Al)	µg/L	5.0	5 if pH <6.5, 100 if pH > 6.5		13.1		19.9			14.4		14.7		72.8	41.9		20.1	73.6			<5		8.2		47.7	8.2		19.2		16.5	
Total Antimony (Sb)	µg/L	1.0			<1		<1.0			<1		<1.0		<1	<1.0		<1	<1.0			<1		<1.0		<1	<1.0		<1		<1.0	
Total Arsenic (As)	µg/L	1.0	5	1000	<1		<1.0			<1		<1.0		<1	<1.0		<1	<1.0			<1		<1.0		<1	<1.0		<1		<1.0	
Total Barium (Ba)	µg/L	1.0			12.5		18.2			14.3		18.6		12.2	15.3		8.6	10.4													

Table 17J.2 Water Quality Laboratory Analytical Results for Additional Lake Samples from April 2012 Field Visit

Parameter	Units	RDL	CWQG Guideline	MMER Guideline	LL1-M		LL2-T		LL3-T		LL4-T	WDR-1	MI1-T	JLC-T	WALSH-T		PL1-T	MOL-1-C									
					16-Apr-12	Lab.Dup.	16-Apr-12	Lab.Dup.	17-Apr-12	Lab.Dup.	17-Apr-12	Lab.Dup.	17-Apr-12	17-Apr-12	17-Apr-12	18-Apr-12	18-Apr-12	Lab.Dup.	18-Apr-12	18-Apr-12	Lab.Dup.						
Anion Sum	me/L	N/A			0.930				1.13			0.940		1.62		0.840		0.910		0.660		1.37		0.620			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			42				52			43		76		39		41		27		61		29			
Calculated TDS	mg/L	1			49.0				60.0			50.0		79.0		45.0		49.0		40.0		75.0		35.0			
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND				ND			ND		ND		ND		ND		ND		ND		ND			
Cation Sum	me/L	N/A			0.880				1.11			0.920		1.40		1.49		0.820		0.890		0.680		1.24		0.660	
Hardness (CaCO3)	mg/L	1			41				52			43		67		71		38		42		29		55		30	
Ion Balance (% Difference)	%	N/A			2.76				0.890			1.08		7.28		1.65		1.20		1.11		1.49		4.98		3.13	
Langelier Index (@ 20C)	N/A				-0.871				-0.880			-0.897		-0.542		-0.399		-1.10		-0.951		-1.46		-0.768		-3.28	
Langelier Index (@ 4C)	N/A				-1.12				-1.13			-1.15		-0.793		-0.650		-1.35		-1.20		-1.71		-1.02		-3.53	
Nitrate (N)	mg/L	0.05	13		0.083				0.094			ND		0.070		0.066		ND		0.11		ND		ND		ND	
Saturation pH (@ 20C)	N/A				8.71				8.50			8.67		8.27		8.31		8.75		8.68		9.00		8.43		8.95	
Saturation pH (@ 4C)	N/A				8.96				8.75			8.92		8.52		8.56		9.00		8.93		9.25		8.68		9.20	
Acidity	mg/L	5			5.2				ND			ND		5.0		ND		ND		ND		ND		5.2		12	
Total Alkalinity (Total as CaCO3)	mg/L	5			43				52			44		76		72		40		42		27		61		29	
Dissolved Chloride (Cl)	mg/L	1			ND				ND			ND		ND		ND		ND		ND		2.2		1.6		ND	
Colour	TCU	5	Narrative		10				9.8			11		9.9		8.3		11		12		22		15		9.6	
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	0.005 (as free CN)	2	ND				ND			ND		ND		ND		ND		ND		ND		ND		ND	
Total Dissolved Solids	mg/L	10			52				48			49		90		74		36		46		41	41	69		29	
Dissolved Fluoride (F-)	mg/L	0.1	0.120 (inorganic F)		ND		ND		ND			ND		ND		ND		ND		ND		ND		ND		ND	
Nitrate + Nitrite	mg/L	0.05			0.083				0.094			ND		0.070		0.066		ND		0.11		0.11		ND		ND	
Nitrite (N)	mg/L	0.01	0.06		ND				ND			ND		ND		ND		ND		ND		ND		ND		ND	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	See Table		ND		ND		ND			ND		ND		ND		ND		ND		ND		ND		ND	
Dissolved Organic Carbon (C)	mg/L	0.5							7.3		7.4	3.9		6.2		3.8		4.3		3.7		4.7		4.7		20	
Total Organic Carbon (C)	mg/L	0.5			2.6	2.8			6.7			3.4		6.3		3.2		4.2		3.7		4.2		4.2		20	
Orthophosphate (P)	mg/L	0.01			ND				ND			ND		ND		ND		ND		ND		ND		ND		ND	
pH	pH	N/A	6.5-9		7.84	7.85			7.62			7.77		7.73		7.91		7.65		7.73		7.54		7.66		5.67	5.64
Total Phosphorus	mg/L				0.005				0.006			0.014		0.011		0.007		0.011		0.011		0.009		0.013		0.007	
Reactive Silica (SiO2)	mg/L	0.5			4.4				4.8			4.4		4.7		4.7		4.2		4.5		5.7		8.2		3.8	
Total Suspended Solids	mg/L	1	Narrative	30	ND				1.4			1.0		2.0		ND		1.0		ND		ND		1.6		1.0	
Dissolved Sulphate (SO4)	mg/L	2			3.4				3.7			3.1		4.4		4.4		2.4		3.1		2.2		5.3		2.3	
Turbidity	NTU	0.1	Narrative		0.33	0.36			0.43			0.40		0.53		0.60		0.31		0.20		0.45		0.96		0.17	
Conductivity	uS/cm	1			87	89			110			88		140		140		79		86		67		120		66	66
Dissolved Mercury (Hg)	µg/L	0.01	0.026		0.073	0.073			ND			ND		ND		ND		ND		ND		ND		ND		0.022	
Dissolved Aluminum (Al)	µg/L	5.0			7.2				5.9	5.9		7.7		ND		ND		9.4		ND		36.7		10.8		18	
Total Aluminum (Al)	µg/L	5.0	5 if pH <6.5, 100 if pH > 6.5		18.6				14			15.5	15.1	12.5		13.8		17.4		8.7		45.8		15.2		18.5	
Total Antimony (Sb)	µg/L	1.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Arsenic (As)	µg/L	1.0	5	1000	ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Barium (Ba)	µg/L	1.0			10.9				14.4			11.7	11.8	17.2		17.9		10.1		12.2		12.5		15.2		8.6	
Total Beryllium (Be)	µg/L	1.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Bismuth (Bi)	µg/L	2.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Boron (B)	µg/L	50	1500		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Cadmium (Cd)	µg/L	0.017	Cadmium concentration = 10 ^{0.86[log(10/hardness)]-3.2} µg/L		ND				0.056			0.045	0.039	0.022		0.035		ND		ND		ND		ND		ND	
Total Calcium (Ca)	µg/L	100			9410				12300			10000	9860	15300		14500		8870		10200		7280		12900		7550	
Total Chromium (Cr)	µg/L	1.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Cobalt (Co)	µg/L	0.40			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Copper (Cu)	µg/L	2.0	Copper concentration = e ^{0.8545[ln(hardness)]-1.465} * 0.2 µg/L	600	ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Iron (Fe)	µg/L	50	300		ND				52			ND	ND	128		136		ND		ND		180		160		ND	
Total Lead (Pb)	µg/L	0.50	Lead concentration = e ^{1.273[ln(hardness)]-4.705} µg/L	400	0.60				0.84			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Magnesium (Mg)	µg/L	100			4560				5890			4770	4740	7480		7790		4070		4490		2580		5220		3050	
Total Manganese (Mn)	µg/L	2.0			4.6				21.3			7.5	7.3	19.5		17.8		4.8		7.6		15.8		75.2		ND	
Total Molybdenum (Mo)	µg/L	2.0	73		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Nickel (Ni)	µg/L	2.0	Nickel concentration = e ^{0.76[ln(hardness)]+1.06} µg/L	1000	ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Phosphorus (P)	µg/L	100	ultra-oligotrophic <4, oligotrophic 4-10, mesotrophic 10-20, meso-eutrophic 20-35, eutrophic 35-100, hyper-eutrophic >100		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Potassium (K)	µg/L	100			1000				1270			1080	1080	1300		1420		1010		954		1210		2100		1020	
Total Selenium (Se)	µg/L	1.0	1		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Silicon (Si)	µg/L	500			1860				2150			1890	1880	1930		1890		1830		1970		2380		3410		1630	
Total Silver (Ag)	µg/L	0.10	0.1		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Sodium (Na)	µg/L	100			651				814			770	752	658		771		748		654		1540		1990		893	
Total Strontium (Sr)	µg/L	2.0			14.0				17.6			14.8	13.9	19.3		20.5		13.4		15.6		18.4		22.5		13.7	
Total Sulphur (S)	µg/L	5000			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Tellurium (Te)	µg/L	2.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Thallium (Tl)	µg/L	0.10	0.8		ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Tin (Sn)	µg/L	2.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Titanium (Ti)	µg/L	2.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Uranium (U)	µg/L	0.10	33 (short term), 15 (long term)		0.13				0.22			0.15	0.14	0.39		0.4		ND		ND		ND		ND		ND	
Total Vanadium (V)	µg/L	2.0			ND				ND			ND	ND	ND		ND		ND		ND		ND		ND		ND	
Total Zinc (Zn)	µg/L	5.0	30	1000	6.9				ND			ND	ND	ND		ND		ND		ND		ND		22.3		ND	
Radium 226	Bq/L				1.11																						

Table 17J.3 In-situ Water Quality Measurements Results for October and March Field Visit

Station	Date	Temperature (deg. C)	Specific Conductance (µS/cm)	Conductivity (µS/cm)	TDS (g/L)	Salinity	DO (%)	DO (mg/L)	pH	pH mV
October 2011 Field Visit										
S1	8-Oct-11	3.57	65	38	0.042	0.03	90.1	11.93	9.00	-85.0
S2	7-Oct-11	1.85	111	62	0.072	0.05	103.4	14.36	8.90	-81.7
S3	8-Oct-11	3.64	56	33	0.037	0.03	87.6	11.59	9.10	-90.0
S4	7-Oct-11	7.00	57	38	0.037	0.03	100.5	12.18	8.94	-83.2
S5	8-Oct-11	4.72	156	95	0.101	0.07	87.8	11.29	9.07	-88.8
L1	7-Oct-11	6.73	66	43	0.043	0.03	101.1	12.35	9.13	-93.0
L2	8-Oct-11	5	157	57	0.102	0.07	93.2	11.91	9.06	-88.4
March 2012 Field Visit										
S1	2-Mar-12	4.27	100	72	0.065	0.05	121.3	15.44	7.60	-82.0
S2	3-Mar-12	3.40	158	123	0.103	0.08	127	17.1	7.70	-92.1
S3	2-Mar-12	5.53	87	54	0.057	0.04	98.8	12.46	7.81	-100.9
S4	2-Mar-12	4	48	38	0.032	0.02	127.7	16.6	8.62	-128
S5	2-Mar-12	4.5	245	155	0.158	0.12	98.8	12.55	7.59	-89.3
L1	2-Mar-12	3.42	104	62	0.068	0.05	131	17.44	7.45	-84.2
L2	2-Mar-12	2.65	85	49	0.055	0.04	94.1	12.67	8.08	-111.1

Table 17J.4 In-situ Water Quality Measurements Results for April and May 2012 Field Visit

Station	Date	Water Temperature (deg. C)	Air Temperature (deg.C)	Water Depth (m)	Depth of Sample (m)	Thickness of Ice (m)	Conductivity (µS/cm)	DO (mg/L)	pH
April 2012 Field Visit									
LL1-M	16-Apr-12	2.18	0	7.7	4.00	0.82	181	10.91	6.30
LL2-T	17-Apr-12	0.06	-7	2.4	1.20	0.85	265	12.06	7.03
LL3-T	17-Apr-12	0.15	-8	2.4	1.20	0.82	221	12.92	7.22
LL4-T	17-Apr-12	0.01	-8	1.0	0.90	0.82	299	12.13	7.42
WDR-1	17-Apr-12	0.04	-6	1.3	0.60	0.4	351	12.09	7.60
MI1-T	17-Apr-12	0.01	-5	12.4	1.00	0.85	200	12.84	7.69
JLC-T	18-Apr-12	1.24	-4	0.2	0.15		219	12.24	7.28
WALSH-T	41017	0.07	-2	0.5	0.15	0.1	171	12.39	7.5
PL-1-T	18-Apr-12	0.11	0	1.2	0.50	0.8	308	11.29	7.49
MOL1-C	18-Apr-12	0.41	0	17.6	1.00	0.8	167	12.15	7.77
May 2012 Field Visit									
S1	29-May-12	6.35	3	0.75	0.30	0.47	72	10.21	7.96
S2	29-May-12	7.02	3	0.4	0.40	0.67	81	9.92	7.90
S3	28-May-12	1.65	2	0.8	0.10	0.4	34	11.09	8.02
S4	28-May-12	3.36	2	0.3	0.10	0.91	45	11.06	7.84
S5	28-May-12	4.1	4	0.7	0.30		125	12.02	8.06
L1	28-May-12	3.88	2	Lake	0.20	0.58	68	11.71	7.79
L2	28-May-12	5.52	4	0.8	0.10	0.55	81	11.46	7.88

Table 17J.5 Sediment Quality General Constituents Laboratory Analytical Results for Routine Monitoring Stations and Selected Lakes

Parameter	Units	RDL(Nov_11)	CCME Guidelines		S3			S4			S5			MS8125 (5-Mar-12)			L2			LV4062			LL1-S			PL 1-S			MOL-1-S	
			ISQG	PEL	5-Mar-12	Lab. Dup.		3-Mar-12	Lab. Dup.		2-Mar-12	Lab. Dup.		(Field Dup.5-Mar-12)	Field Dup. -Lab.Dup.		28-Nov-11	Lab. Dup.		28-Nov-11(DUP)	16-Apr-12		Lab. Dup.	RDL	18-Apr-12	Lab. Dup.	RDL	18-Apr-12	RDL	
Inorganics																														
Chloride (Cl)	mg/kg	5.0			65			<5.0			29			6.5			7			7			8.9		5.0	29		5.0	36	5.0
Moisture	%	1			88			18			62			15			38	33		36			86		1	88		1	91	1
Organic Carbon (TOC)	g/kg	0.20			210			1.8			70			1.9			27			27			74		0.40	99		1	79	0.50
Total Kjeldahl Nitrogen	µg/g	10			6810			92			2870			122			1540			1310			5810		50	6710		50	6060	50
< -4 Phi (16 mm)	%	0.10			100			100			100			100			100			100			100		0.10	100		0.10	100	0.10
< -3 Phi (8 mm)	%	0.10			100			100			100			100			100			100			100		0.10	100		0.10	100	0.10
< -2 Phi (4 mm)	%	0.10			100			100			100			100			100			100			100		0.10	100		0.10	100	0.10
< -1 Phi (2 mm)	%	0.10			95 (2)			67			98 (1)			58			73 (1)			90 (2)			100		0.10	100		0.10	100	0.10
< 0 Phi (1 mm)	%	0.10			81 (3)			40			93			31			65			81			73		0.10	74		0.10	74	0.10
< +1 Phi (0.5 mm)	%	0.10			67 (4)			20			87			14			52			65			65		0.10	62		0.10	62	0.10
< +2 Phi (0.25 mm)	%	0.10			53			5.4			70			4.0			26			32			60		0.10	48		0.10	55	0.10
< +3 Phi (0.12 mm)	%	0.10			40			1.5			45			1.3			13			16			55		0.10	33		0.10	49	0.10
< +4 Phi (0.062 mm)	%	0.10			33			0.93			26			0.85			6.1			6.8			49		0.10	25		0.10	45	0.10
< +5 Phi (0.031 mm)	%	0.10			28			0.68			17			0.65			5.5			6.0			39		0.10	23		0.10	43	0.10
< +6 Phi (0.016 mm)	%	0.10			20			0.47			9.9			0.47			4.6			5.4			31		0.10	17		0.10	35	0.10
< +7 Phi (0.0078 mm)	%	0.10			11			0.28			3.6			0.38			3.4			4.3			18		0.10	11		0.10	20	0.10
< +8 Phi (0.0039 mm)	%	0.10			10			0.29			2.5			0.45			3.3			4.1			15		0.10	11		0.10	16	0.10
< +9 Phi (0.0020 mm)	%	0.10			11			0.3			1.8			0.29			3.2			3.9			14		0.10	9.4		0.10	14	0.10
Gravel	%	0.10			5.2			33			2.1			42			27			9.6			ND		0.10	ND		0.10	ND	0.10
Sand	%	0.10			61			66			72			57			67			84			51		0.10	75		0.10	55	0.10
Silt	%	0.10			23			0.63			23			0.40			2.8			2.7			34		0.10	14		0.10	29	0.10
Clay	%	0.10			10			0.29			2.5			0.45			3.3	4.1		4.1			15		0.10	11		0.10	16	0.10

Table 17J.6 Sediment Quality Metals Laboratory Analytical Results for Routine Monitoring Stations and Selected Lakes

Parameter	Units	RDL	CCME Guidelines		S3			S4		S5			MS8125 (5-Mar-12)			L2			LV4062			LL1-S			PL 1-S			MOL-1-S	
			ISQG	PEL	5-Mar-12	Lab. Dup.		3-Mar-12	Lab. Dup.	2-Mar-12	Lab. Dup.		(Field Dup.5-Mar-12)	Field Dup. -Lab.Dup.		28-Nov-11	Lab. Dup.		28-Nov-11(DUP)	16-Apr-12		Lab. Dup.	RDL	18-Apr-12	Lab. Dup.	RDL	18-Apr-12	RDL	
Metals																													
Acid Extractable Aluminum (Al)	µg/g	50			13000			3500					3300	3300															
Available Aluminum (Al)	mg/kg	10			13000			2300		4500	4700		2300			1500		1500		16000		10	10000		10	23000	10		
Available Antimony (Sb)	mg/kg	2.0			<2.0			<2.0		<2.0	<2.0		<2.0			ND		ND		ND		2.0	ND		2.0	ND	2.0		
Available Arsenic (As)	mg/kg	2.0	5.9	17	<2.0			<2.0		2.3	2.6		<2.0			ND		ND		2.2		2.0	ND		2.0	ND	2.0		
Acid Extractable Barium (Ba)	µg/g	0.5			150			43					39	38															
Available Barium (Ba)	mg/kg	5.0			120			23		290	240		17			46		47		350		5.0	140		5.0	860	5.0		
Acid Extractable Beryllium (Be)	µg/g	0.5			<0.5			<0.5					<0.5	<0.5															
Available Beryllium (Be)	mg/kg	2.0			<2.0			<2.0		<2.0	<2.0		<2.0			ND		ND		ND		2.0	ND		2.0	ND	2.0		
Acid Extractable Bismuth (Bi)	µg/g	5			<5			<5					<5	<5															
Available Bismuth (Bi)	mg/kg	2.0			<2.0			<2.0		<2.0	<2.0		<2.0			ND		ND		ND		2.0	ND		2.0	ND	2.0		
Available Boron (B)	mg/kg	5.0			<5.0			<5.0		<5.0	<5.0		<5.0			ND		ND		ND		5.0	ND		5.0	ND	5.0		
Acid Extractable Cadmium (Cd)	µg/g	0.3			0.6			<0.3					<0.3	<0.3															
Available Cadmium (Cd)	mg/kg	0.30	0.6	3.5	0.5			<0.30		0.32	0.35		<0.30			ND		ND		0.59		0.30	ND		0.30	0.65	0.30		
Acid Extractable Calcium (Ca)	µg/g	50			7800			2100					1700	1600															
Acid Extractable Chromium (Cr)	µg/g	0.5			49			26					23	22															
Available Chromium (Cr)	mg/kg	2.0	37.3	90	48			15		22	23		11			11		9		65		2.0	31		2.0	71	2.0		
Acid Extractable Cobalt (Co)	µg/g	0.5			9.1			3					2.5	3.2															
Available Cobalt (Co)	mg/kg	1.0			9.8			1.7		5.8	6.4		1.7			2		2		13		1.0	11		1.0	17	1.0		
Acid Extractable Copper (Cu)	µg/g	0.5			36			3.9					2.7	19 (1)															
Available Copper (Cu)	mg/kg	2.0	35.7	197	14			<2.0		9.6	8.7		<2.0			2		2		25		2.0	16		2.0	37	2.0		
Acid Extractable Iron (Fe)	µg/g	50			23000			11000					9400	9200															
Available Iron (Fe)	mg/kg	50			21000			5500		52000	54000		6400			31000		25000		71000		50	23000		50	44000	50		
Acid Extractable Lead (Pb)	µg/g	1			5			3					2	2															
Available Lead (Pb)	mg/kg	0.50	35	91.3	5.3			1.7		2.1	2.2		1.5			1.1		1.1		16		0.50	2.3		0.50	7.8	0.50		
Available Lithium (Li)	mg/kg	2.0			16			4.1		3.4	3.6		3.5			ND		ND		11		2.0	7.7		2.0	14	2.0		
Acid Extractable Magnesium (Mg)	µg/g	50			4100			2600					2400	2400															
Acid Extractable Manganese (Mn)	µg/g	10			2800			390					290	310															
Available Manganese (Mn)	mg/kg	2.0			650			220		15000	16000		110			400		390		4100		2.0	1100		2.0	16000	2.0		
Available Mercury (Hg)	mg/kg	0.10	0.17	0.486	0.17			<0.10		<0.10	<0.10		<0.10			ND		ND		0.11		0.10	ND		0.10	0.15	0.10		
Acid Extractable Molybdenum (Mo)	µg/g	0.5			14			0.8					0.6	0.8															
Available Molybdenum (Mo)	mg/kg	2.0			14			<2.0		14	14		<2.0			ND		ND		4.1		2.0	5.9		2.0	14	2.0		
Acid Extractable Nickel (Ni)	µg/g	0.5			19			7.9					7.1	7.9															
Available Nickel (Ni)	mg/kg	2.0			20			5.3		18	20		5.5			4		4		40		2.0	35		2.0	49	2.0		
Acid Extractable Phosphorus (P)	µg/g	20			770			560		950			460	450		700	700	670		1100		20	570		20	3900	200		
Acid Extractable Potassium (K)	µg/g	200			330			950					910	900															
Available Rubidium (Rb)	mg/kg	2.0			3.9			4.8		2.9	3.1		5.1			ND		ND		19		2.0	4.5		2.0	15	2.0		
Available Selenium (Se)	mg/kg	2.0			<2.0			<2.0		<2.0	<2.0		<2.0			ND		ND		ND		2.0	ND		2.0	ND	2.0		
Acid Extractable Silver (Ag)	µg/g	0.3			<0.3			<0.3					<0.3	<0.3															
Available Silver (Ag)	mg/kg	0.50			<0.50			<0.50		<0.50	<0.50		<0.50			ND		ND		ND		0.50	ND		0.50	ND	0.50		
Acid Extractable Sodium (Na)	µg/g	100			<100			<100					<100	<100															
Available Strontium (Sr)	mg/kg	5.0			25			8.6		13	13		8.6			5		5		23		5.0	18		5.0	39	5.0		
Acid Extractable Strontium (Sr)	µg/g	1			23			7					6	6															
Available Thallium (Tl)	mg/kg	0.10			0.24			<0.10		0.71	0.81		<0.10			ND		ND		0.41		0.10	0.48		0.10	0.44	0.10		
Acid Extractable Sulphur (S)	µg/g	50			1800			87					100	180															
Available Tin (Sn)	mg/kg	2.0			<2.0			<2.0		<2.0	<2.0		<2.0			ND		ND		ND		2.0	ND		2.0	ND	2.0		
Acid Extractable Tin (Sn)	µg/g	1			<1			<1					<1	2															
Available Uranium (U)	mg/kg	0.10			4.8			0.35		9.7	11		0.23			1.3		1.2		12		0.10	6		0.10	28	0.10		
Acid Extractable Titanium (Ti)	µg/g	5			450			350					330	330															
Available Vanadium (V)	mg/kg	2.0			32			8.3		16	17		7.4			9		7		39		2.0	17		2.0	42	2.0		
Available Zinc (Zn)	mg/kg	5.0	123	315	91			8.2		49	51		8.8			8		9		110		5.0	70		5.0	130	5.0		
Acid Extractable Vanadium (V)	µg/g	0.5			40			15					14	13															
Acid Extractable Zinc (Zn)	µg/g	3			100			16					13	13															
Acid Extractable Zirconium (Zr)	µg/g	5			<5			<5					<5	<5															

Table 17J.7 Sediment Quality Hydrocarbons Laboratory Analytical Results for Routine Monitoring Stations and Selected Lakes

Parameter	Units	RDL	CCME Guidelines		S3			S4			S5			MS8125 (5-Mar-12)			L2			LV4062		LL1-S			PL 1-S			MOL-1-S	
			ISQG	PEL	5-Mar-12	Lab. Dup.		3-Mar-12	Lab. Dup.		2-Mar-12	Lab. Dup.		(Field Dup. 5-Mar-12)	Field Dup. -Lab.Dup.		28-Nov-11	Lab. Dup.		28-Nov-11(DUP)		16-Apr-12	Lab. Dup.	RDL	18-Apr-12	Lab. Dup.	RDL	18-Apr-12	RDL
Polyaromatic Hydrocarbons																													
1-Methylnaphthalene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
2-Methylnaphthalene	mg/kg	0.0050	0.0202	0.2010	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Acenaphthene	mg/kg	0.0050	0.0067	0.0889	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Acenaphthylene	mg/kg	0.0050	0.0059	0.1280	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Anthracene	mg/kg	0.0050	0.0469	0.2450	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(a)anthracene	mg/kg	0.0050	0.0317	0.3850	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(a)pyrene	mg/kg	0.0050	0.0319	0.7820	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(b)fluoranthene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(g,h,i)perylene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(j)fluoranthene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Benzo(k)fluoranthene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Chrysene	mg/kg	0.0050	0.0571	0.8620	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Dibenz(a,h)anthracene	mg/kg	0.0050	0.0062	0.1350	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Fluoranthene	mg/kg	0.0050	0.1110	2.3550	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Fluorene	mg/kg	0.0050	0.0212	0.1440	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Indeno(1,2,3-cd)pyrene	mg/kg	0.0050			<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Naphthalene	mg/kg	0.0050	0.0346	0.3910	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Perylene	mg/kg	0.0050			<0.0050			<0.0050		1.3	<0.0050			<0.0050	<0.0050		0.19		0.16			1.4	1.5	0.0050	2.3		0.0050	1.6	0.0050
Phenanthrene	mg/kg	0.0050	0.0419	0.5150	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Pyrene	mg/kg	0.0050	0.0530	0.8750	<0.0050			<0.0050			<0.0050			<0.0050	<0.0050		ND			ND		ND	ND	0.0050	ND		0.0050	ND	0.0050
Surrogate Recovery (%)																													
D10-Anthracene	%				86			82			86			83	92		79			81		84	85		86			79	
D14-Terphenyl	%				92			94			130			91	97		121			109		96	99		100			95	
D8-Acenaphthylene	%				82			76			82			77	80		78			77		80	80		78			77	
BTEx & F1 Hydrocarbons																													
Benzene	µg/g	0.020			<0.20			<0.020			<0.060			<0.020			ND			ND			0.14	ND		0.20	ND	0.20	
Toluene	µg/g	0.020			<0.20			<0.020			<0.060			<0.020			ND			ND		ND		0.14	ND		0.20	ND	0.20
Ethylbenzene	µg/g	0.020			<0.20			<0.020			<0.060			<0.020			ND			ND		ND		0.14	ND		0.20	ND	0.20
o-Xylene	µg/g	0.020			<0.20			<0.020			<0.060			<0.020			ND			ND		ND		0.14	ND		0.20	ND	0.20
p+m-Xylene	µg/g	0.040			<0.40			<0.040			<0.12			<0.040			ND			ND		ND		0.28	ND		0.40	ND	0.40
Total Xylenes	µg/g	0.040			<0.40			<0.040			<0.12			<0.040			ND			ND		ND		0.28	ND		0.40	ND	0.40
F1 (C6-C10)	µg/g	10			<100			<10			<30			<10			ND			ND		ND		70	ND		100	ND	100
F1 (C6-C10) - BTEx	µg/g	10			<100			<10			<30			<10			ND			ND		ND		70	ND		100	ND	100
F2-F4 Hydrocarbons																													
F4G-sg (Grav. Heavy Hydrocarbons)																	1200			440	590								
F2 (C10-C16 Hydrocarbons)	µg/g	10			<100			<10		46				<10			ND			ND		ND		70	ND		100	500	100
F3 (C16-C34 Hydrocarbons)	µg/g	10			720			<10		140				<10			71			67		ND		70	ND		100	180	100
F4 (C34-C50 Hydrocarbons)	µg/g	10			240			<10		<30				<10			13			16		ND		70	ND		100	ND	100
Reached Baseline at C50	µg/g				Yes			Yes		Yes				Yes			Yes			Yes		Yes		Yes			Yes		
Surrogate Recovery (%)																													
1,4-Difluorobenzene	%				97			97			97			99			101			102		99			102			103	
4-Bromofluorobenzene	%				109			108			108			108			98			100		96			99			85	
D10-Ethylbenzene	%				98			99			98			98			87			92		97			105			110	
D4-1,2-Dichloroethane	%				93			92			92			93			96			98		95			95			98	
o-Terphenyl	%				90			84			86			88			127			116		113			113			115	