

Report ID: 317679-IAS
 Report Date: 27-Jun-19
 Date Received: 14-Jun-19

CERTIFICATE OF ANALYSIS

for
 Belleisle Watershed Coalition
 PO box 856
 Hatfield Point, NB E5T 2S4



921 College Hill Rd
 Fredericton NB
 Canada E3B 6Z9
 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Erin Douthwright

Project #: Not Available

Location: Belleisle Bay

Analysis of Surface Water

RPC Sample ID:		317679-1	317679-2	317679-3	
Client Sample ID:		17/19/08000	17/19/08001	17/19/08002	
Date Sampled:		13-Jun-19	13-Jun-19	13-Jun-19	
Analytes	Units	RL			
Sodium	mg/L	0.05	18.1	18.6	20.9
Potassium	mg/L	0.02	1.21	1.25	1.22
Calcium	mg/L	0.05	7.35	7.25	7.63
Magnesium	mg/L	0.01	2.87	2.95	3.17
Alkalinity (as CaCO ₃)	mg/L	2	22	23	22
Chloride	mg/L	0.5	30.0	32.0	37.4
Fluoride	mg/L	0.05	0.14	0.12	0.13
Sulfate	mg/L	1	7	7	8
Bromine	mg/L	0.01	0.10	0.11	0.12
Ammonia (as N)	mg/L	0.05	< 0.05	< 0.05	< 0.05
Un-ionized @ 20°C	mg/L	-	< 0.001	< 0.001	< 0.001
Nitrate + Nitrite (as N)	mg/L	0.05	< 0.05	< 0.05	0.05
Nitrite (as N)	mg/L	0.05	< 0.05	< 0.05	< 0.05
Nitrate (as N)	mg/L	0.05	< 0.05	< 0.05	0.05
Nitrogen - Total	mg/L	0.2	0.4	0.3	0.4
Phosphorus - Total	mg/L	0.002	0.048	0.034	0.031
Carbon - Dissolved Organic	mg/L	0.5	4.9	4.8	5.1
Colour	TCU	5	30	30	30
Conductivity	µS/cm	1	164	173	190
pH	units	-	7.2	7.2	7.2
Turbidity	NTU	0.1	5.9	2.4	1.6
Calculated Parameters					
Bicarbonate (as CaCO ₃)	mg/L	-	22.0	23.0	22.0
Carbonate (as CaCO ₃)	mg/L	-	0.033	0.034	0.033
Hardness (as CaCO ₃)	mg/L	0.2	30.2	30.3	32.1
TDS (calc)	mg/L	-	81	84	92
Saturation pH (20°C)	units	-	9.1	9.1	9.1
Langelier Index (20°C)	-	-	-1.92	-1.91	-1.91

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Ross Kean

Brannen Burhoe

Ross Kean
 Department Head
 Inorganic Analytical Chemistry

SURFACE WATER CHEM

Brannen Burhoe
 Chemical Technician
 Inorganic Analytical Services

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Attention: Erin Douthwright

Project #: Not Available

Location: Belleisle Bay

Analysis of Surface Water

RPC Sample ID:			317679-4	317679-5	317679-6
Client Sample ID:			17/19/08003	17/19/08004	17/19/08005
Date Sampled:			13-Jun-19	13-Jun-19	13-Jun-19
Analytes	Units	RL			
Sodium	mg/L	0.05	19.8	14.5	15.2
Potassium	mg/L	0.02	1.15	0.91	0.96
Calcium	mg/L	0.05	7.75	8.75	8.61
Magnesium	mg/L	0.01	3.05	2.53	2.58
Alkalinity (as CaCO ₃)	mg/L	2	22	25	24
Chloride	mg/L	0.5	34.8	24.5	25.8
Fluoride	mg/L	0.05	0.13	0.12	0.13
Sulfate	mg/L	1	8	7	7
Bromine	mg/L	0.01	0.11	0.08	0.09
Ammonia (as N)	mg/L	0.05	< 0.05	< 0.05	< 0.05
Un-ionized @ 20°C	mg/L	-	< 0.001	< 0.001	< 0.001
Nitrate + Nitrite (as N)	mg/L	0.05	0.07	0.11	0.11
Nitrite (as N)	mg/L	0.05	< 0.05	< 0.05	< 0.05
Nitrate (as N)	mg/L	0.05	0.07	0.11	0.11
Nitrogen - Total	mg/L	0.2	0.4	0.4	0.4
Phosphorus - Total	mg/L	0.002	0.025	0.018	0.021
Carbon - Dissolved Organic	mg/L	0.5	5.3	5.8	5.5
Colour	TCU	5	31	37	37
Conductivity	µS/cm	1	182	152	155
pH	units	-	7.3	7.3	7.3
Turbidity	NTU	0.1	1.7	0.7	1.0
Calculated Parameters					
Bicarbonate (as CaCO ₃)	mg/L	-	21.9	24.9	23.9
Carbonate (as CaCO ₃)	mg/L	-	0.041	0.047	0.045
Hardness (as CaCO ₃)	mg/L	0.2	31.9	32.3	32.1
TDS (calc)	mg/L	-	89	74	76
Saturation pH (20°C)	units	-	9.1	9.0	9.0
Langelier Index (20°C)	-	-	-1.81	-1.69	-1.71

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Project #: Not Available

Location: Belleisle Bay

Analysis of Surface Water

RPC Sample ID:		317679-7	317679-8
Client Sample ID:		17/19/08006	17/19/08007
Date Sampled:		13-Jun-19	13-Jun-19
Analytes	Units	RL	
Sodium	mg/L	0.05	14.8
Potassium	mg/L	0.02	0.92
Calcium	mg/L	0.05	8.69
Magnesium	mg/L	0.01	2.56
Alkalinity (as CaCO ₃)	mg/L	2	24
Chloride	mg/L	0.5	25.3
Fluoride	mg/L	0.05	0.13
Sulfate	mg/L	1	7
Bromine	mg/L	0.01	0.08
Ammonia (as N)	mg/L	0.05	< 0.05
Un-ionized @ 20°C	mg/L	-	< 0.001
Nitrate + Nitrite (as N)	mg/L	0.05	0.12
Nitrite (as N)	mg/L	0.05	< 0.05
Nitrate (as N)	mg/L	0.05	0.12
Nitrogen - Total	mg/L	0.2	0.4
Phosphorus - Total	mg/L	0.002	0.020
Carbon - Dissolved Organic	mg/L	0.5	5.8
Colour	TCU	5	36
Conductivity	µS/cm	1	153
pH	units	-	7.3
Turbidity	NTU	0.1	0.9
Calculated Parameters			
Bicarbonate (as CaCO ₃)	mg/L	-	23.9
Carbonate (as CaCO ₃)	mg/L	-	0.045
Hardness (as CaCO ₃)	mg/L	0.2	32.2
TDS (calc)	mg/L	-	75
Saturation pH (20°C)	units	-	9.0
Langelier Index (20°C)	-	-	-1.71

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Date Sampled:		13-Jun-19	13-Jun-19	13-Jun-19	
Analytes	Units	RL			
Aluminum	mg/L	0.001	0.107	0.051	0.044
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.001	< 0.001	< 0.001	< 0.001
Barium	mg/L	0.001	0.016	0.015	0.011
Beryllium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Bismuth	mg/L	0.001	< 0.001	< 0.001	< 0.001
Boron	mg/L	0.001	0.012	0.013	0.012
Cadmium	mg/L	0.00001	0.00001	< 0.00001	< 0.00001
Calcium	mg/L	0.05	7.35	7.25	7.63
Chromium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Cobalt	mg/L	0.0001	0.0001	< 0.0001	< 0.0001
Copper	mg/L	0.001	< 0.001	< 0.001	< 0.001
Iron	mg/L	0.02	0.41	0.31	0.11
Lead	mg/L	0.0001	0.0003	0.0002	< 0.0001
Lithium	mg/L	0.0001	0.0005	0.0005	0.0005
Magnesium	mg/L	0.01	2.87	2.95	3.17
Manganese	mg/L	0.001	0.094	0.110	0.024
Molybdenum	mg/L	0.0001	0.0001	0.0001	< 0.0001
Nickel	mg/L	0.001	< 0.001	< 0.001	< 0.001
Potassium	mg/L	0.02	1.21	1.25	1.22
Rubidium	mg/L	0.0001	0.0010	0.0009	0.0008
Selenium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.05	18.1	18.6	20.9
Strontium	mg/L	0.001	0.050	0.050	0.058
Tellurium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Tin	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Uranium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Vanadium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001

SURFACE WATER METALS

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Analysis of Surface Water

RPC Sample ID:			317679-4	317679-5	317679-6
Client Sample ID:			17/19/08003	17/19/08004	17/19/08005
Date Sampled:			13-Jun-19	13-Jun-19	13-Jun-19
Analytes	Units	RL			
Aluminum	mg/L	0.001	0.044	0.050	0.047
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.001	< 0.001	< 0.001	< 0.001
Barium	mg/L	0.001	0.010	0.009	0.010
Beryllium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Bismuth	mg/L	0.001	< 0.001	< 0.001	< 0.001
Boron	mg/L	0.001	0.012	0.009	0.009
Cadmium	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001
Calcium	mg/L	0.05	7.75	8.75	8.61
Chromium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Cobalt	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Copper	mg/L	0.001	< 0.001	< 0.001	< 0.001
Iron	mg/L	0.02	0.10	0.10	0.09
Lead	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Lithium	mg/L	0.0001	0.0005	0.0005	0.0005
Magnesium	mg/L	0.01	3.05	2.53	2.58
Manganese	mg/L	0.001	0.019	0.017	0.018
Molybdenum	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	mg/L	0.001	< 0.001	< 0.001	< 0.001
Potassium	mg/L	0.02	1.15	0.91	0.96
Rubidium	mg/L	0.0001	0.0007	0.0006	0.0006
Selenium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.05	19.8	14.5	15.2
Strontium	mg/L	0.001	0.059	0.067	0.067
Tellurium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Tin	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Uranium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001
Vanadium	mg/L	0.001	< 0.001	< 0.001	< 0.001
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001

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Location: Belleisle Bay

Analysis of Surface Water

RPC Sample ID:		317679-7	317679-8
Client Sample ID:		17/19/08006	17/19/08007
Date Sampled:		13-Jun-19	13-Jun-19
Analytes	Units	RL	
Aluminum	mg/L	0.001	0.047
Antimony	mg/L	0.0001	< 0.0001
Arsenic	mg/L	0.001	< 0.001
Barium	mg/L	0.001	0.009
Beryllium	mg/L	0.0001	< 0.0001
Bismuth	mg/L	0.001	< 0.001
Boron	mg/L	0.001	0.009
Cadmium	mg/L	0.00001	< 0.00001
Calcium	mg/L	0.05	8.69
Chromium	mg/L	0.001	< 0.001
Cobalt	mg/L	0.0001	< 0.0001
Copper	mg/L	0.001	< 0.001
Iron	mg/L	0.02	0.10
Lead	mg/L	0.0001	< 0.0001
Lithium	mg/L	0.0001	0.0005
Magnesium	mg/L	0.01	2.56
Manganese	mg/L	0.001	0.016
Molybdenum	mg/L	0.0001	< 0.0001
Nickel	mg/L	0.001	< 0.001
Potassium	mg/L	0.02	0.92
Rubidium	mg/L	0.0001	0.0006
Selenium	mg/L	0.001	< 0.001
Silver	mg/L	0.0001	< 0.0001
Sodium	mg/L	0.05	14.8
Strontium	mg/L	0.001	0.068
Tellurium	mg/L	0.0001	< 0.0001
Thallium	mg/L	0.0001	< 0.0001
Tin	mg/L	0.0001	< 0.0001
Uranium	mg/L	0.0001	< 0.0001
Vanadium	mg/L	0.001	< 0.001
Zinc	mg/L	0.001	< 0.001

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Methods

<u>Analyte</u>	<u>RPC SOP #</u>	<u>Method Reference</u>	<u>Method Principle</u>
Ammonia	4.M47	APHA 4500-NH ₃ G	Phenate Colourimetry
pH	4.M03	APHA 4500-H ⁺ B	pH Electrode - Electrometric
Alkalinity (as CaCO ₃)	4.M43	EPA 310.2	Methyl Orange Colourimetry
Chloride	4.M44	APHA 4500-CL E	Ferricyanide Colourimetry
Fluoride	4.M30	APHA 4500-F- D	SPADNS Colourimetry
Sulfate	4.M45	APHA 4500-SO ₄ E	Turbidimetry
Nitrate + Nitrite (as N)	4.M48	APHA 4500-NO ₃ H	Hydrazine Red., Derivatization, Colourimetry
Nitrite (as N)	4.M49	APHA 4500-NO ₂ - B	Ferrous Ammonium Sulfate Colourimetry
Nitrogen - Total	IAS-M57.01	ASTM D8083-16	Combustion/Chemiluminescence
Phosphorus - Total	4.M17	APHA 4500-P E	Digestion, Manual Colourimetry
Carbon - Dissolved Organic	IAS-M57.01	APHA 5310 B	Combustion/NDIR
Turbidity	4.M06	APHA 2130 B	Nephelometry
Colour	4.M55	APHA 2120 Color (A,C)	Single Wavelength Spectrophotometry
Conductivity	4.M04	APHA 2510 B	Conductivity Meter - Electrode
Trace Metals	4.M01/4.M29	EPA 200.8/EPA 200.7	ICP-MS/ICP-ES