UPPER NINE MILE RIVER WATERSHED SURFACE WATER QUALITY ASSESSMENT

2023 Results Update

March 2025

1. INTRODUCTION AND PURPOSE

A surface water quality study was initiated by the Five Bridges Wilderness Heritage Trust (FBWHT) in the spring of 2014 to determine if development activities within the headwaters of the Nine Mile River watershed have had an adverse effect on surface water quality of the Nine Mile River. The Nine Mile River is the main river flowing through the Five Bridge Lakes Wilderness Area, a protected wilderness area established by the Province of Nova Scotia in 2011 (Figure 1, Appendix A). The upper watershed of the Nine Mile River examined in this assessment is situated north of Highway 103 and north of the Five Bridge Lakes Wilderness Area (Figure 2, Appendix A). The activities and land uses within this part of the watershed which singularly or cumulatively may have an effect on the water quality of the river system, include:

- Kingswood rural residential subdivision established along Hammonds Plains Road in the 1980s;
- Highland Park rural residential subdivision established along Hammonds Plains Road in the 1960s;
- Glen Arbour rural residential subdivision, commercial plazas, restaurants and Hammonds Plains Consolidated Elementary School established in 1967 through to present day;
- Lakeside Industrial Park established in the 1970s;
- The Links Brunello Golf Course (opened in 2015) and the associated rural residential subdivision Brunello Estates starting in 2011, as well as recent / ongoing commercial development along Timberlea Village Parkway near Highway 103 and at the intersection with St. Margaret's Bay Road;
- Otter Lake Municipal Landfill, established in 1997;
- Greenwood Heights rural residential subdivision in Timberlea, established in the 1970s, and expanded in the 1990s; and
- Halifax Regional Municipality (HRM) Lakeside/Timberlea wastewater treatment facility in Timberlea, commissioned in 1984.

The rural residential subdivisions have on-site wells and septic systems except for Timberlea and western portion of Lakeside which transmit domestic sewage wastewater to the HRM wastewater treatment facility situated on the east side of the Nine Mile River, as shown on Figure 8 (Appendix A). This facility discharges treated effluent to the Nine Mile River. The eastern portion of Lakeside, Beechville and Lakeside Industrial Park directs sewage wastewater to the Halifax wastewater treatment facility on Lower Water Street.

Initially, a total of seven sampling locations (SW1 to SW7) were selected in 2014 immediately downstream of these development areas; however, in 2015 an additional three sampling locations (SW8 to SW10) were added. Samples were collected on five occasions (August 2014, June 2015, November 2016, November 2020 and August 2023) to in an attempt to account for seasonal variability in weather and stream flow conditions. Photos and Figures of the ten sampling locations are provided in Appendix A.

2. ACKNOWLEDGEMENTS

Funding for this project, to cover third party costs and expenses, was initially provided in 2014-15 by RBC via their Bluewater Grant Program, and in 2016, 2020 and 2023 with funds received by FBWHT

as a Partner of the Bay Treasure Chest Association. The sampling events in 2014 and 2015 were led by FBWHT Board Member and Retired Hydrogeologist Peter Lund, assisted by summer students from Clean Nova Scotia in 2014 and the Sackville Rivers Association in June 2015. In 2016 and 2020, water samples were collected by Peter Lund and Bridget Adams, also a Retired Hydrogeologist and Board Member of FBWHT.

Prior to the first sampling event, the summer students assembled mapping of land use, surficial and bedrock geology, zoning, land uses, ditches and streams in order to create a Geographic Information System (GIS) database of baseline information of the upper watershed. We would like to acknowledge and thank Jeff Parks, P.Geo., a Hydrogeologist, GIS mapping expert and local resident of Hubley, who volunteered his time to upgrade and edit the maps and figures as provided in Appendix A.

3. PREVIOUS ASSESSMENTS

Previous surface water quality data were obtained from HRM related to annual monitoring reports submitted by the Otter Lake Landfill operators and Brunello Estates as a requirement of their HRM development approvals. HRM also completed surface sample sampling for five years across the municipality and three of those locations were in the current study area.

4. SCOPE OF WORK

The scope of the assessment included the following activities:

- Collection of surface water samples at seven locations (SW1 to SW7) on August 6- and 11, 2014 for chemical analyses of general chemistry, total metals, total suspended solids (TSS), select bacteriological parameters (total, e-coli and fecal coliform) at Maxaam Analytics (now Bureau Veritas) in Bedford, NS;
- Collection of surface water samples at SW1 to SW10 on June 3, 2015, November 22, 2016, November 17, 2020 and August 22, 2023(also included petroleum hydrocarbons), for the same chemical parameters (except for e-coli and coliforms) but analyzed at AGAT Laboratories in Dartmouth, NS;
- Collection of field blanks and duplicate samples for analysis of chemical parameters to ensure Quality Assurance and Quality Control (QA/QC);
- Collection of field data using a YSI multimeter (WetPro) to measure for pH, temperature, specific conductance, colour, dissolved oxygen, and total dissolved solids (TDS), provided by St. Mary's University, during the August 2014 and November 2016 sampling events, and again in 2023 for TDS, specific conductance and temperature;
- Recording of daily weather conditions leading up to and including days of sampling;
- Obtaining available GIS-based digital mapping from the Province and HRM;
- Obtaining annual monitoring reports submitted by consultants to HRM by respective developers/operators of Brunello Golf Course/Estates and Otter Lake landfill;
- Obtaining annual monitoring data for three locations in the Study Area, spanning 2008-2012 from HRM;
- Creation of GIS mapping into Figures, as provided in Appendix A;

- Assemble tables of SW1 to SW10 analytical data, plus QA/QC data, with comparison to applicable CCME Freshwater Aquatic Life Guidelines and Nova Scotia Environmental Quality Standards (NS-EQS) for Contaminated Sites (Pathway Specific Standards for Surface Water) (Appendix B);
- Interpretation of findings; and
- Preparation of report.

Maxaam Analytics and AGAT Laboratories provided the sample bottles, containing preservatives where required, and affixed with the appropriate labels, Chain of Custody forms, and coolers.

5. DISCUSSION

5.1 Geology

The entire Nine Mile River watershed is underlain by Late Devonian aged granitic rocks of the South Mountain Batholith, except for the upper reaches of the watershed where sample stations SW1 and SW10 are located in Hammonds Plains, which is underlain by metasiltstone, slate and metasandstone of the older Cambrian-Ordovician aged Halifax and Goldenville Groups (Figure 3, Appendix A).

5.2 Surface Water Quality Sampling Locations

The sampling locations were selected to determine if development upstream of these locations has had any impact on the receiving waters which all flow to the Nine Mile River. Focus was placed on surface streams in the headwaters of the Nine Mile River north of Highway 103. The only major development within the Nine Mile River watershed south of Highway 103 is the Otter Lake Landfill situated east of the Nine Mile River.

The sampling event in August 2014 was conducted during a low flow period with little rain occurring in the preceding six days (3.9 mm occurring three days before the sampling event). The sampling events in June 2015, November 2016 and November 2020 were conducted the day after moderate rainfall events. The August 2023 sampling event was conducted four days following a heavy rainfall event (38.4 mm).

The land use situated upstream of the sample locations are described as:

- SW1 (Masons Mill Pond Brook) – Hammonds Plains Consolidated School built in 1967, portion of Glen Arbour residential subdivision constructed in the late 1990s, two small strip malls along Hammonds Plains Road constructed in early 2000s and Vernon's Thunderbird Diner constructed in 2017 (Figure 4, Appendix A).
- SW2 (brook between Thompsons Pond and Coxs Lake) – the older portion of Highland Park residential subdivision built in the 1960s (Figure 5, Appendix A).
- SW3 (Fraser's Lake outflow) – downstream of the older portion of Highland Park, newer portion of Kingswood built in the 1980s and Voyageur Estates built in the 1990s. (Figure 6, Appendix A). This sample location is downstream of SW1 and SW2.
- SW4 (Governor Lake outflow) – off Trinity Road, downstream of Brunello Golf Course which opened in 2015 and Brunello Estates residential subdivision which started in 2011, Lakeside Industrial Park and residents along Highway 3 in Timberlea adjoining Governors Lake. This sample location is downstream of SW6 (Figure 7, Appendix A).

- SW5 (Nine Mile River, south of Highway 3) – downstream of all other sample locations except for SW8 and SW9 (Figure 8, Appendix A).
- SW6 (inlet to Governor Lake) - downstream of Lakeside Industrial Park (Figure 9, Appendix A).
- SW7 (inlet to The Mill Pond from Kingswood subdivision) –downstream of the older portion of Kingswood residential subdivision (Figure 6, Appendix A).
- SW8 (Nine Mile River, south (downstream) of HRM Wastewater Treatment Facility commissioned in 1984) – north of Highway 103, downstream of all sample locations except for SW9 (Figure 8, Appendix A.
- SW9 (outflow of Half Mile Lake in Timberlea subdivision) –situated downstream of Greenwood Heights residential subdivision in Timberlea (Figure 8, Appendix A).
- SW10 (outflow of Schmidt's Lake in Voyageur Estates subdivision)–situated downstream of newer portion of Kingswood subdivision (Figure 10, Appendix A.

All residential and commercial developments along Hammonds Plains Road have individual on-site septic systems and domestic wells. All residential, industrial and commercial developments in Timberlea and Lakeside are connected to municipal water and wastewater services, with the exception of a few homes north of Highway #3 along Fraser's Lake in Timberlea.

5.3 Surface Water Quality Results

The water quality results indicate there are no obvious adverse effects, nor any cumulative effects, from the various land uses situated in the headwaters of the Nine Mile River, with the exception that Dissolved Oxygen (DO) was below the acceptable CCME Freshwater Aquatic Life (FAL) Guidelines (6.5 – 9.5 mg/L) at all sample locations (1.72-5.03 mg/L) in August 2014, with the exception of the upper reaches of the watershed at SW1 and SW2 (7.5-8.4 mg/L respectively). The DO levels in November 2014 were within acceptable ranges, so the low DO levels in the summer can be attributed to the higher water temperatures in the summer, i.e. in the order of 20-23 degrees Celsius.

It is also noted that fecal coliforms and E. Coli were reported at all sample locations when analyzed for in 2014-15 and were higher in the August 2014 and June 2015 sample results, compared with the November 2015 results. There are no surface water guidelines for coliforms or E. Coli.

The water is slightly acidic, with pH values reported in the range of 5.56 – 7.34, compared to the CCME FAL Guideline range of 6.5-9.0. These reported values are common throughout the Province, as are the elevated aluminum values reported at all sample locations (45-452 µg/L) compared with the NS Environmental Quality Standard (EQS) and CCME FAL range of 5-100 µg/L. The exception was an aluminum value of 634 µg/L at SW-1 in June 2015, however, the values at this location were much lower (46-186 µg/L) in the other sampling events. The pH of rainfall in the Province is generally low, as is the buffering capacity of soil and bedrock, as demonstrated by low reported hardness, along with low carbonate and bicarbonate alkalinity across the Province.

Iron was frequently above the referenced guideline of 300 µg/L across the region, with values in the range of 51 – 1,430 µg/L reported, with the exception of Kingswood Subdivision (SW7) and Voyageur Estates (SW10) where values were reported below the guideline, except for values of 394 and 412 µg/L in August 2023, respectively. Iron was also generally below the guideline downgradient of the Lakeside Industrial Park (SW6), with the exception of an elevated value of 1200 µg/L reported in August 2014 and slightly elevated value of 350 µg/L in August 2023. Iron values were below the guideline in 2014

and 2015 at Fraser's Lake outlet (SW3), Trinity Road (SW4) and South of Highway #3 (SW5) and were above the guideline in the 2016, 2020 and 2023 sampling events. The highest iron values were reported at all locations in August 2023, with the exception of SW3 (Fraser's Lake outflow) and SW6 (Lakeside Industrial Park). Iron, like aluminum, is typically elevated across much of the Province.

Zinc was detected consistently above the NS EQS guideline of 7 µg/L at SW4 (Trinity Rd.) and SW6 (Lakeside Industrial Park), with values of 8.1-45 µg/L reported and zero to three event exceedances at other locations. There were exceedances of the NS EQS guideline for cadmium at SW1, SW4, SW5 and SW6 in 2014/2015 and copper in a few sampling events, but no trend overall.

Lead was detected occasionally and was below the guidelines with the exception of one sample at SW1 (mill Pond) on June 3, 2015 with a value of 5 µg/L reported and in the duplicate sample collected at SW5 (South of Highway #3) on August 22, 2023 with a value of 5.2 µg/L reported.

Elevated sodium and chloride were reported at the inflow (SW6) to and at the outflow (SW4) from Governor Lake in two of the sampling events (August 11, 2014 and June 3, 2015), but not in the Nine Mile River at the junction of Highway 3 (SW5). This likely is the cause of elevated conductivity values reported for SW4 and SW6 of 500-980 µS/cm in these two sampling events.

Fluoride was elevated above the guideline of 0.12 mg/L in the one sampling event of June 3, 2015 at a few locations (SW2, SW3, SW4, SW5, SW8 and SW9) when values of 0.2 mg/L were reported. However, at SW6 (Lakeside Industrial Park), values were in the range of 0.14-0.3 mg/L in 2015, 2016 and 2023.

There is no apparent evidence of effects from fertilizer use considering the nitrate, nitrite and phosphate levels are reported low. Results of petroleum hydrocarbon analyses were all below detection. Total suspended solids (TSS) are consistently below guidelines, which is a good indicator that not much is silt getting into the river system.

6. CONCLUSIONS

There may be issues to fish in the watercourses in the upper reaches of the Nine Mile River system related to elevated temperatures and low dissolved oxygen levels in summer months due to the lack of sufficient tree cover, along with the presence of Fecal Coliforms and E. Coli throughout the year in all water courses sampled in 2014-2016. There were no other apparent concerns identified from the select chemical analyses.

Any questions and/or comments, please contact the Five Bridges Wilderness Heritage Trust.

Sincerely,

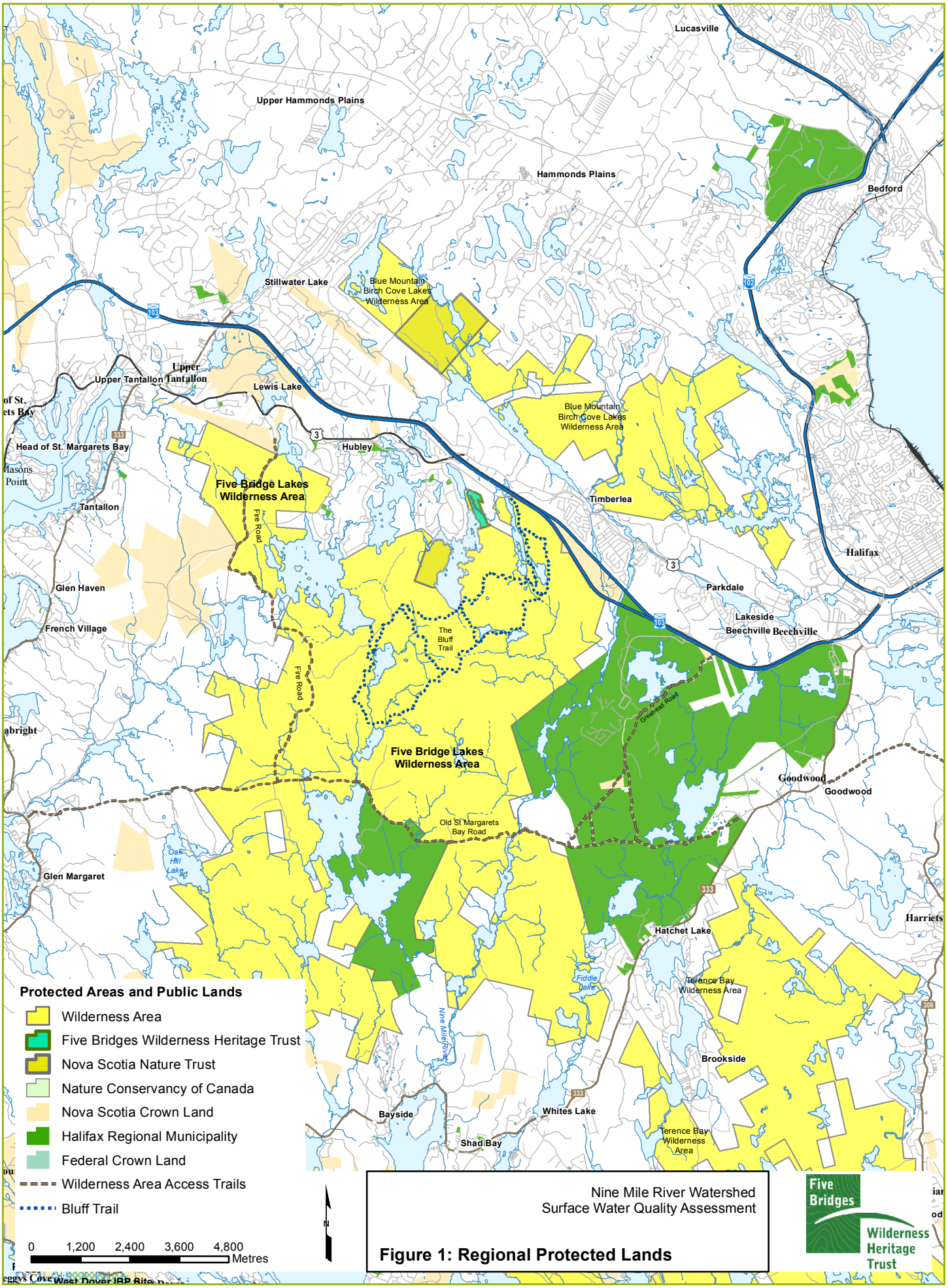
Peter Lund, P.Geo. (Retired)
Project Manager

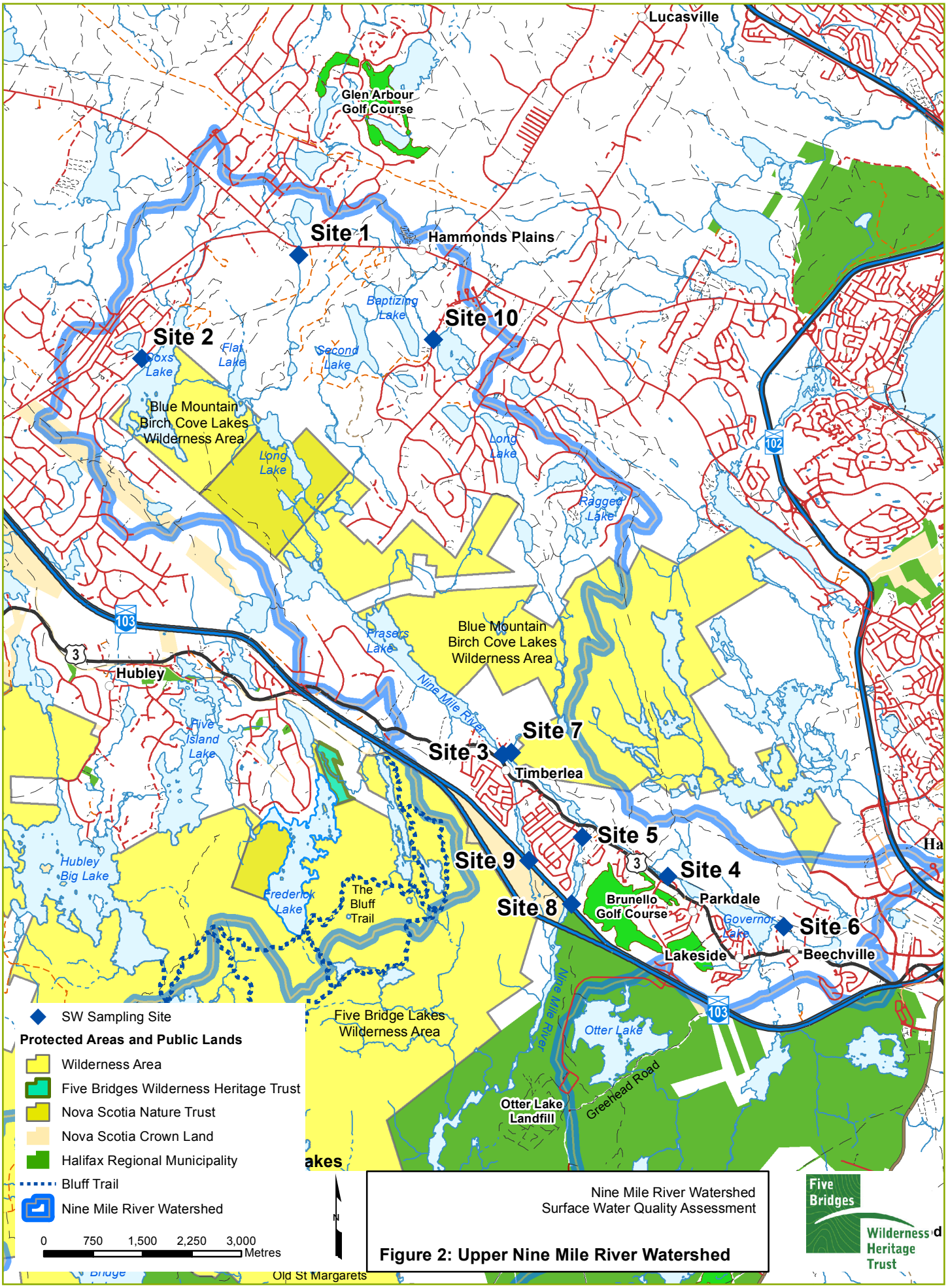
Bridget Adams, P.Geo. (Retired)
Reviewer

Attachments: Appendix A: Figures and Photos
Appendix B: Analytical Tables

APPENDIX A

Figures and Photos


Lucasville
Upper Hammonds Plains
Hammonds Plains
Bedford
Stillwater Lake
Blue Mountain Birch Cove Lakes Wilderness Area
Upper Tantallon
Lewis Lake
Head of St. Margarets Bay
Hubley
Five Bridge Lakes Wilderness Area
Timberlea
Halifax
Tantallon
Glen Haven
French Village
Parkdale
Lakeside
Beechville
Fire Road
The Bluff Trail
Greenhead Road
Goodwood
Old St Margarets Bay Road
Glen Margaret
Oak Hill Lake
Hatchet Lake
Terence Bay Wilderness Area
Fiddle Lake
Nine Mile River
Brookside
Bayside
Whites Lake
Shad Bay
Protected Areas and Public Lands
Wilderness Area
Five Bridges Wilderness Heritage Trust
Nova Scotia Nature Trust
Nature Conservancy of Canada
Nova Scotia Crown Land
Halifax Regional Municipality
Federal Crown Land
Wilderness Area Access Trails
Bluff Trail
0 1,200 2,400 3,600 4,800
Metres
N
Nine Mile River Watershed
Surface Water Quality Assessment
Figure 1: Regional Protected Lands
Five Bridges Wilderness Heritage Trust


Lucasville
Glen Arbour Golf Course
Site 1
Hammonds Plains
Baptizing Lake
Site 10
Site 2
Flat Lake
Second Lake
Foxs Lake
Blue Mountain Birch Cove Lakes Wilderness Area
Long Lake
Long Lake
Ragged Lake
102
103
3
Hubley
Prasers Lake
Blue Mountain Birch Cove Lakes Wilderness Area
Nine Mile River
Site 7
Site 3
Timberlea
Five Island Lake
Site 5
Site 9
Site 4
3
Hubley Big Lake
Frederick Lake
The Bluff Trail
Site 8
Brunello Golf Course
Parkdale
Governor Lake
Site 6
Lakeside
Beechville
Nine Mile River
Five Bridge Lakes Wilderness Area
Otter Lake
103
Otter Lake Landfill
Greenhead Road
SW Sampling Site
Protected Areas and Public Lands
Wilderness Area
Five Bridges Wilderness Heritage Trust
Nova Scotia Nature Trust
Nova Scotia Crown Land
Halifax Regional Municipality
Bluff Trail
Nine Mile River Watershed
0 750 1,500 2,250 3,000
Metres
N
Nine Mile River Watershed
Surface Water Quality Assessment
Figure 2: Upper Nine Mile River Watershed
Five Bridges Wilderness Heritage Trust
Old St Margarets

Legend

Nine Mile River Watershed

Bedrock Geology

Late Devonian

South Mountain Batholith (granitoids)

- Panuke Lake (DSpflm); Tantallon (DStflm); Halifax Peninsula (DShflm) leucomonzogranite
- Tantallon (megacrystic) (DStflm) leucomonzogranite
- Tantallon (porphyritic) (DStflm) leucomonzogranite
- Halifax Peninsula (DShclm); New Ross (DSnclm) leucomonzogranite
- Peggys Cove (DSpbm); Sandy Lake (DSslbm) biotite monzogranite
- Harrietsfield (DShm) muscovite-biotite monzogranite
- Quarry Lake Granodiorite (DSqg)

Early Cambrian to Early Ordovician

Halifax Group

- Bluestone Formation (EOHb) light grey to blue-grey slate
- Cunard Formation (LCHc) black to rust-brown slate with thin beds and lenses of minor black metasiltstone

Goldenville Group

- Beaverbank Formation (MCGb) greenish-grey to black metasiltstone to slate
- Taylors Head Formation (ECGt) grey metasandstone

Contact

- Assumed
- Approximate
- Defined

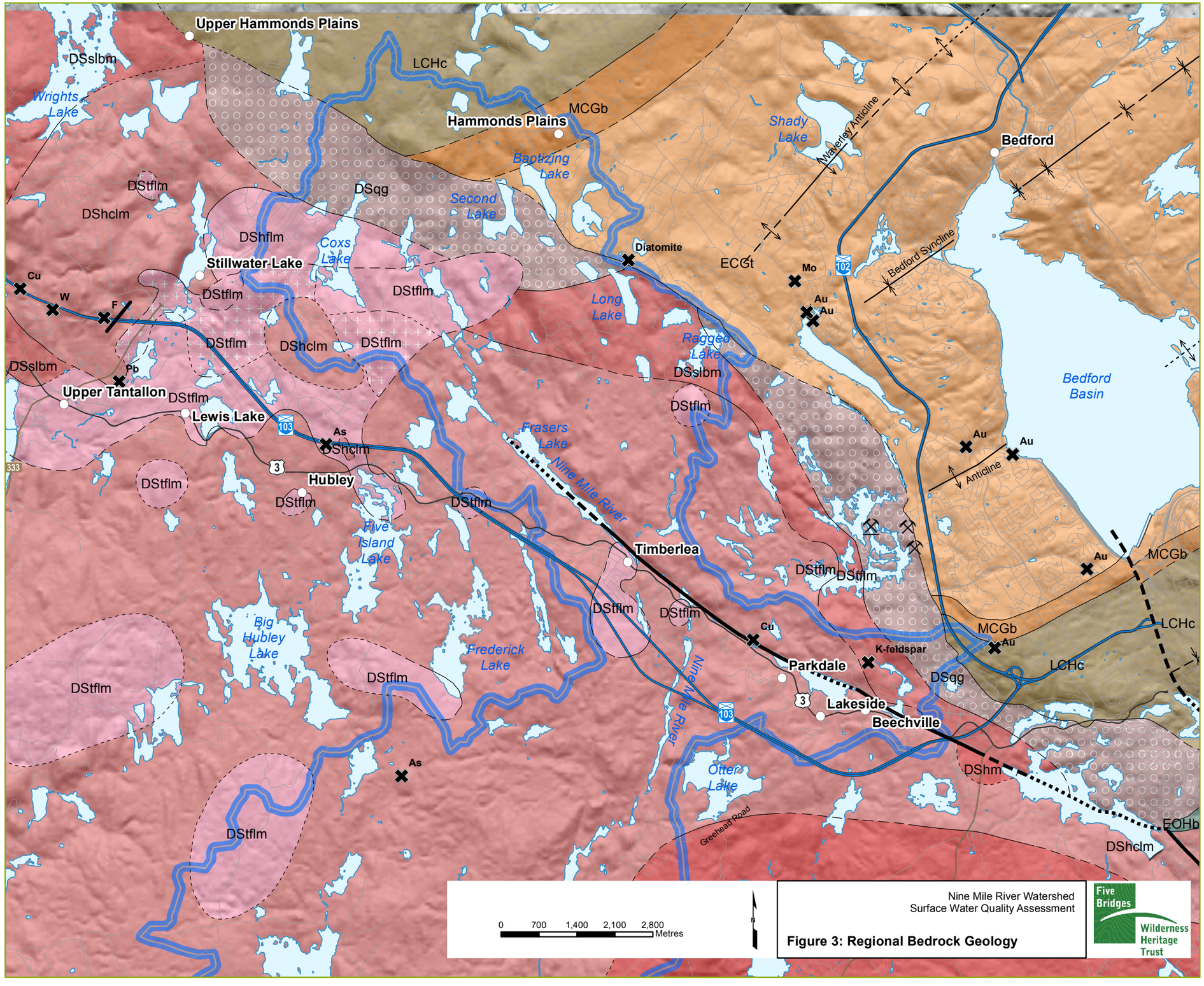
Fault

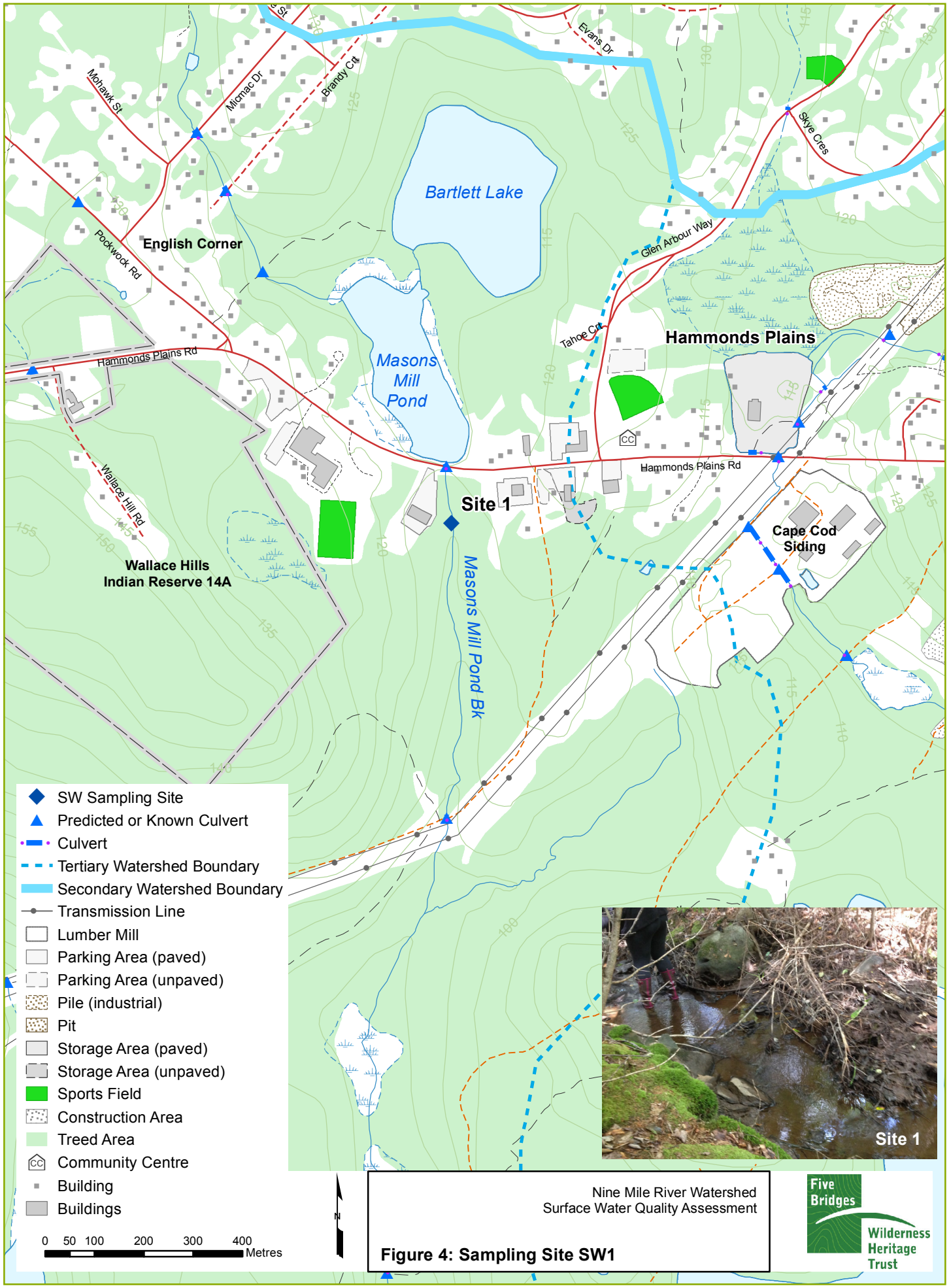
- Assumed
- Approximate
- Defined

- Mineral Occurrences

As - arsenopyrite, pyrite, molybdenite
Au - native gold, galena, sphalerite
Cu - malachite, pyrite
Diatomite
F - flourite
K-feldspar - feldspar, cordierite
Mo - molybdenite
Pb - galena, pyrite

Source: https://novascotia.ca/natr/meb/data/mg/ofm/pdf/ofm_2014-010_d440_dp.pdf





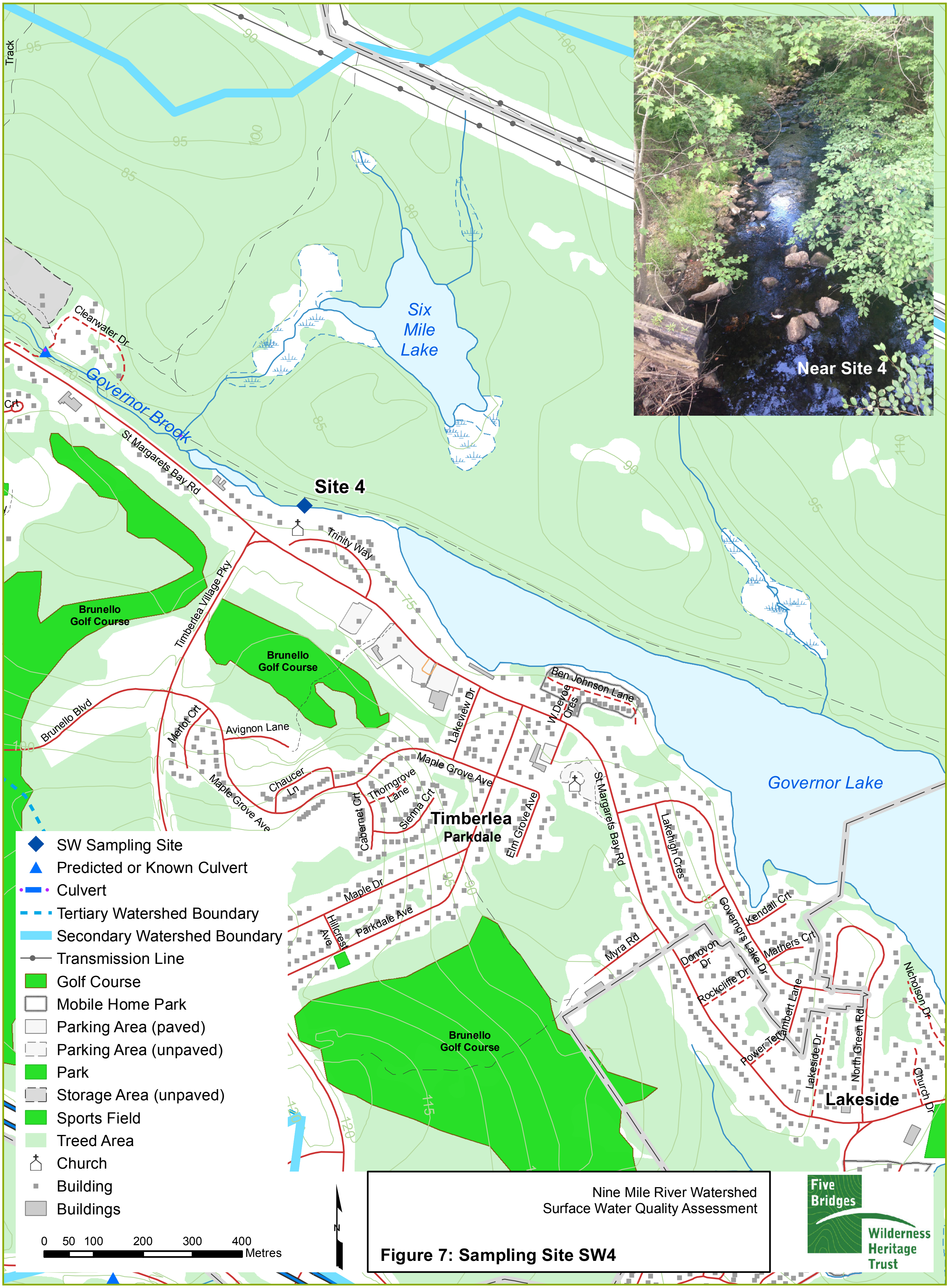
Nine Mile River Watershed
Surface Water Quality Assessment

Figure 4: Sampling Site SW1

Five Bridges Wilderness Heritage Trust


Hammonds Plains
Yankeetown
Site 2
Thompsons Pond
Long Cove
Coxs Lake
Hub Rock
Upper Duck Rocks
Doreys Island
Spruce Island
The Gullies
Shelby Dr
Kinara Dr
Blue Jay Lane
Sunnyview Terr
Kingsway Rd
Riley Rd
Mackenzie Lane
Old Mill Rd
Lakeview Terr
Park Terr
Northwood Rd
Kingsmere Pl
Westwind Dr
Southwood Rd
Sylvania Terr
Timberlane Terr
Hammonds Plains Rd
Pinetree Cres
Softwind Lane
Track
Chalamont Dr
Juniper Terr
Chloe Lane
Lucky Lane
Greenhill Rd
Paula Dr
Cheswick Lane
Wynward Ave
Soaring Way
Rockcliffe Cres
Rising Sun Trail
SW Sampling Site
Predicted or Known Culvert
Culvert
Tertiary Watershed Boundary
Secondary Watershed Boundary
Transmission Line
Parking Area (unpaved)
Park
Sports Field
Treed Area
Building
Buildings
0 50 100 200 300 400
Metres
N
Site 2
Nine Mile River Watershed
Surface Water Quality Assessment
Figure 5: Sampling Site SW2
Five Bridges
Wilderness Heritage Trust


Frasers Lake
Frasers Pond
The Mill Pond
Nine Mile River
Half Mile Lake
Timberlea
Greenwood Heights
Site 3
Site 7
Oak Lane
Sawdust Rd
Hillside Dr
Rockwood Hills Dr
St Margarets Bay Rd
Driveway
Conifer Crt
Sprucevale Dr
Birchdale Ave
Fraser Rd
Fir Tree Lane
Richard St
Foresiglen Dr
Kingsmere Crt
Meadowdale Cres
James St
Darrell Crt
Dixon Crt
Charles Rd
Ash Grove Lane
Roland Ave
Track
Halfmile Lane
Cider Maple Dr
Norway Maple Dr
Mountain Maple Dr
Tiger Maple Dr
Silver Maple Dr
Sugar Maple Dr
Maplewood Dr
Red Maple Dr
Greenwood Ave
Wedgewood Ave
Eisener St
Aspen Grove
Xoon Crt
Brentwood Ave
Oakdale Crt
Dorothy Cox Ave
Rosewood Ave
Highway 103 WB
Highway 103 EB
103
SW Sampling Site
Predicted or Known Culvert
Culvert
Tertiary Watershed Boundary
Secondary Watershed Boundary
Cemetery
Parking Area (unpaved)
Pit
Sports Field
Treed Area
Church
Building
Buildings
0 50 100 200 300 400
Metres
N
Nine Mile River Watershed
Surface Water Quality Assessment
Figure 6: Sampling Site SW3 and SW7
Five Bridges
Wilderness Heritage Trust



Nine Mile River Watershed
Surface Water Quality Assessment

Figure 7: Sampling Site SW4

Five Bridges Wilderness Heritage Trust

Nine Mile River
Half Mile Lake
Half Mile Run
Nine Mile River
Timberlea
Greenwood Heights
Site 5
Site 9
Site 8
Lakeside Sewage Treatment Facility
Brunello Golf Course
Highway 103 WB
Track
Halfmile Lane
Cider Maple Dr
Norway Maple Dr
Mountain Maple Dr
Tiger Maple Dr
Silver Maple Dr
Sugar Maple Dr
Maplewood Dr
Red Maple Dr
Greenwood Ave
Wedgewood Ave
Eisener St
Brentwood Ave
Aspen Grove
John Crt
Rosewood Ave
Rivenwood Dr
Oakvale Crt
Johnson Ave
White Birch Dr
Dorothy Cres
Sprucewood Ave
Sleepy Hollow
Kleffenz Lane
Sprucebrook La
Riverview Dr
Longard Dr

- SW Sampling Site
- Predicted or Known Culvert
- Culvert
- Tertiary Watershed Boundary
- Secondary Watershed Boundary
- Cemetery
- Golf Course
- Parking Area (unpaved)
- Pit
- Sports Field
- Sewage Treatment Plant
- Treed Area
- Church
- Building
- Pumping Station
- Buildings

0 50 100 200 300 400 Metres

N

Nine Mile River Watershed
Surface Water Quality Assessment

Figure 8: Sampling Sites SW5, SW8, SW9

Five Bridges Wilderness Heritage Trust


Site 6
Timberlea
Governor Lake
Site 6
Lakeside Industrial Park
Dominion Cres
Lakeside Park Dr
Lakehigh Cres
Kendall Crt
Governors Lake Dr
Mathers Crt
Donovon Dr
Rockcliffe Dr
Nicholson Dr
Raines Mill Rd
Boylan Lane
Lovett Lake
St Margarets Bay Rd
Lakeside
Oliver St
Hamilton St
Balsam St
Beechville
SW Sampling Site
Predicted or Known Culvert
Culvert
Tertiary Watershed Boundary
Secondary Watershed Boundary
Transmission Line
Golf Course
Mobile Home Park
Parking Area (paved)
Parking Area (unpaved)
Pit
Storage Area (unpaved)
Sports Field
Construction Area
Treed Area
Community
Church
Building
Post Office
Pumping Station
Buildings
0 50 100 200 300 400
Metres
N
Nine Mile River Watershed
Surface Water Quality Assessment
Figure 9: Sampling Site SW6
Five Bridges
Wilderness Heritage Trust

Hammonds Plains

Hammonds Plains Road

Hammonds Plains Rd

Driveway

Ellard Lane

Equine Crt

Harness Trail

Voyageur Way

Dressage Row

Bridle Path

Appaloosa

Citation Dr

Baptizing Lake

Nijinsky Lane

Pinto Pl

Oxer Close

Voyaguer Lakes

Site 10

Schmidt Lake

Voyageur Way

Yearling Close

Saddleback Rd

Jumper Lane

St George Blvd

Kingswood

Seth Aaron Dr

Hannah Elise Dr

Kingswood Dr

Kara Crt

Roupen Crt

Mortons Lake

- SW Sampling Site
- Predicted or Known Culvert
- Culvert
- Secondary Watershed Boundary
- Transmission Line
- Cemetery
- Golf Course
- Landfill Site
- Pile (industrial)
- Storage Area (unpaved)
- Construction Area
- Treed Area
- Community
- Church
- Building
- Buildings

0 50 100 200 300 400 Metres

N

Nine Mile River Watershed
Surface Water Quality Assessment

Figure 10: Sampling Site SW10

Five Bridges Wilderness Heritage Trust

SW1 – South of Hammonds Plains Road, downstream of Glen Arbour and small strip malls

SW2 – Looking north toward Highland Park subdivision

SW3 – Looking downstream from outflow of Frasers Lake eastward

SW5 – South of Highway 3 and HRM sewage treatment plant, looking south

SW9 – Looking north toward subdivision in Timberlea north of Highway 103

SW10- Downstream of Schmidt Lake, looking north

APPENDIX B

Analytical Tables including Field Measurements
and
Laboratory Certificate of Analyses (2023)

Table 1: Nine Mile River Surface Water Sampling Results

Comments / Parameters	Units	Comparison Criteria		FBWHT SW1 Mill Pond Outlet				
		CCME FAL[1]	NS EQS[2]	6-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	60		119.6		55
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	7.52		**6.38**		
Specific Conductance	umho/cm	---	---			183.8		111
Field Temperature	°C	---	---	20.4		6		20.3
Colour	TCU	---	---			113.1		
Dissolved Oxygen % Saturation	%	---	---	75.4		101		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	7.5		12.8		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	6.8	**5.94**	6.81	6.85	6.52
Reactive Silica (SiO_2)	mg/L	---	---	2.3	4.3	2.7	2.6	1.3
Chloride (Cl)	mg/L	120 (640)[1]	120	91	102	38	54	18
Fluoride (F)	mg/L	0.12	0.12	n/a	<0.1	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	7.3	14	13	8	2
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	13	6	8	13	11
Colour	TCU	---	---	25	<5	29	73	142
Turbidity	NTU	narrative	---	0.53	37.2	2.3	3.3	2.79
Conductivity	µS/cm	---	---	330	394	181	220	115
Nitrite + Nitrate	mg/L	---	---	0.33	0.87	0.28	0.34	<0.05
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.33	0.87	0.28	0.34	<0.05
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	0.05	0.04	0.08	0.07
Total Organic Carbon (C)	mg/L	---	---	4.2	2.5	8.1	7.8	31.4
Orthophosphate (P)	mg/L	---	---	0.011	<0.01	<0.01	<0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	1.4	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	31	0	24.5	23	14.5
Lab Calculated Parameters								
Anion Sum	me/L	---	---	3	3.35	1.52	1.96	0.77
Cation Sum	me/L	---	---	2.72	3.71	1.61	1.85	1.13
Ion Balance (% Difference)	%	---	---	4.9	5.1	2.9	2.89	19
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	13	6	8	13	11
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	170	206	92	114	52
Langelier Index (@ 20C)	-	---	---	-2.53	-4.09	-3.03	-2.56	-3.4
Langelier Index (@ 4C)	-	---	---	-2.78	-4.41	-3.35	-2.81	-3.72
Saturation pH (@ 20C)	-	---	---	9.33	10	9.84	9.42	9.92
Saturation pH (@ 4C)	-	---	---	9.58	10.3	10.2	9.67	10.2
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	16	90	10	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>250	605	52	n/a	n/a
E. Coli	CFU/100mL	---	---	18	20	3	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**46**	**634**	**199**	**112**	**186**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	20	48	13	11.4	9
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	17	14	<50	7
Total Cadmium (Cd)	µg/L	equation[1]	0.09	0.024	**0.126**	0.017	<0.010	<0.09
Total Calcium (Ca)	µg/L	---	---	8800	6500	7000	6720	4000
Total Chromium (Cr)	µg/L	8.91	8.9	<1	3	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	0.72	**2**	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	2	2	1.1	<2
Total Iron (Fe)	µg/L	300	300	**850**	**844**	**361**	**1150**	**1430**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	**5**	<0.5	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	2200	1500	1700	1570	1100
Total Manganese (Mn)	µg/L	varies [1]	430	300	9.62	33	77.1	203
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	<100	150	50	<100	0.35
Total Potassium (K)	µg/L	---	---	1200	1300	1200	1400	2000
Total Selenium (Se)	µg/L	1	1	<1	1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	47000	71100	24200	29900	16200
Total Strontium (Sr)	µg/L	---	21000	44	51	30	28.3	18
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	<2	17	3	<2.0	3
Total Uranium (U)	µg/L	15 (33)[1]	15	<0.1	<0.1	<0.1	<0.10	<0.2
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**12**	**20**	**12**	<5.0	<5
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Comments / Parameters	Units	Comparison Criteria		FBWHT SW2 Highland Park				
		CCME FAL[1]	NS EQS[2]	6-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	95		152.1		66
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	7.64		**6.29**		
Specific Conductance	umho/cm	---	---			234.2		132
Field Temperature	°C	---	---	22.9		7.5		20.8
Colour	TCU	---	---			156		
Dissolved Oxygen % Saturation	%	---	---	90.7		95		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	8.44		11.3		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	7.34	6.76	7.19	7.13	**6.48**
Reactive Silica (SiO_2)	mg/L	---	---	2	1.1	2.6	2.9	<0.5
Chloride (Cl)	mg/L	120 (640)[1]	120	55	47	50	44	18
Fluoride (F)	mg/L	0.12	0.12	n/a	**0.2**	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	3.7	8	10	8	6
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	19	<5	16	18	16
Colour	TCU	---	---	35	26	22	35	<5.00
Turbidity	NTU	narrative	---	0.55	3.9	2.8	2.1	0.77
Conductivity	µS/cm	---	---	230	204	230	190	137
Nitrite + Nitrate	mg/L	---	---	0.1	0.24	0.17	0.24	0.18
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.1	0.24	0.17	0.24	0.18
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	0.04	0.1	<0.03
Total Organic Carbon (C)	mg/L	---	---	5	4.3	7.4	6.1	9.3
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	<1	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	27	23.2	31.5	25	23.7
Lab Calculated Parameters								
Anion Sum	me/L	---	---	2.03	1.51	1.95	1.78	0.97
Cation Sum	me/L	---	---	1.96	1.73	2.09	1.65	1.3
Ion Balance (% Difference)	%	---	---	1.75	6.8	3.3	3.79	14.7
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	19	<5	16	18	16
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	120	94	116	103	63
Langelier Index (@ 20C)	-	---	---	-1.83	-3.29	-2.25	-2.11	-3.04
Langelier Index (@ 4C)	-	---	---	-2.08	-3.61	-2.57	-2.36	-3.36
Saturation pH (@ 20C)	-	---	---	9.17	10.1	9.44	9.24	9.52
Saturation pH (@ 4C)	-	---	---	9.42	10.4	9.76	9.49	9.84
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	1	40	8	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>250	85	<1	n/a	n/a
E. Coli	CFU/100mL	---	---	1	45	<1	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**45**	**124**	**182**	**92.6**	**67**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	10	14	15	13.7	15
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	17	18	<50	25
Total Cadmium (Cd)	µg/L	equation[1]	0.09	<0.01	<0.017	<0.017	<0.010	<0.09
Total Calcium (Ca)	µg/L	---	---	7900	6800	9000	7030	7000
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	<0.4	<1	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	2	1	1.09	<2
Total Iron (Fe)	µg/L	300	300	**390**	**321**	**397**	244	**519**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	<0.5	<0.5	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	1800	1500	2200	1760	1500
Total Manganese (Mn)	µg/L	varies [1]	430	33	68	98	46.8	65
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	<2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	<100	190	50	<100	0.86
Total Potassium (K)	µg/L	---	---	1400	1400	2100	1770	1900
Total Selenium (Se)	µg/L	1	1	<1	1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	32000	27700	31300	25000	17200
Total Strontium (Sr)	µg/L	---	21000	38	33	44	34.6	32
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	<2	4	6	4.2	<3
Total Uranium (U)	µg/L	15 (33)[1]	15	<0.1	<0.1	<0.1	<0.10	<0.2
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	6.1	<5	<5	<5.0	<5
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Comments / Parameters	Units	Comparison Criteria		FBWHT SW3 Fraser's Lake Outlet				
		CCME FAL[1]	NS EQS[2]	6-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	45		50.7		26
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	7.41		**5.79**		
Specific Conductance	umho/cm	---	---			77.6		51
Field Temperature	°C	---	---	20.8		8.3		21.8
Colour	TCU	---	---			52.8		
Dissolved Oxygen % Saturation	%	---	---	56.9		101		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	5.03		11.5		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	**6.45**	**5.89**	**6.2**	**6.12**	**6.16**
Reactive Silica (SiO_2)	mg/L	---	---	1.3	2.2	2.3	2.8	14.7
Chloride (Cl)	mg/L	120 (640)[1]	120	16	12	15	14	8
Fluoride (F)	mg/L	0.12	0.12	n/a	**0.2**	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	2.7	4	4	3	2
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<1	<5	<5	<5	5
Colour	TCU	---	---	43	53	53	86	17
Turbidity	NTU	narrative	---	0.81	4.8	2.1	0.9	0.9
Conductivity	µS/cm	---	---	67	59	78	67	55
Nitrite + Nitrate	mg/L	---	---	<0.05	0.11	<0.05	0.06	<0.05
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	<0.05	0.11	<0.05	0.06	<0.05
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	0.04	0.06	<0.03
Total Organic Carbon (C)	mg/L	---	---	5.6	6.4	9.7	9.6	15.9
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	0.98
Total Suspended Solids (TSS)	mg/L	narrative	---	1.4	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	7.8	5.9	9.6	9	8.5
Lab Calculated Parameters								
Anion Sum	me/L	---	---	0.51	0.43	0.51	0.48	0.37
Cation Sum	me/L	---	---	ND	0.48	0.74	0.62	0.58
Ion Balance (% Difference)	%	---	---	6.42	5.1	18.5	12.7	22.8
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<5	<5	<1	5
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	33	27	35	34	25
Langelier Index (@ 20C)	-	---	---	nc	-4.72	-4.22	NC	-4.29
Langelier Index (@ 4C)	-	---	---	nc	-5.04	-4.54	NC	-4.61
Saturation pH (@ 20C)	-	---	---	nc	10.6	10.4	NC	10.4
Saturation pH (@ 4C)	-	---	---	nc	10.9	10.7	NC	10.8
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	6	25	1	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>250	310	6	n/a	n/a
E. Coli	CFU/100mL	---	---	6	10	1	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**150**	**225**	**270**	**253**	**331**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	10	10	14	12.7	10
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	9	8	<50	5
Total Cadmium (Cd)	µg/L	equation[1]	0.09	0.014	0.025	0.024	0.022	<0.09
Total Calcium (Ca)	µg/L	---	---	2100	1700	2700	2410	2400
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	<0.4	<1	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	<1	<1	0.63	<2
Total Iron (Fe)	µg/L	300	300	89	146	**403**	**327**	**393**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	<0.5	<0.5	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	600	400	700	680	600
Total Manganese (Mn)	µg/L	varies [1]	430	10	25	54	42.6	52
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	<2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	<100	180	40	<100	0.72
Total Potassium (K)	µg/L	---	---	710	500	800	638	900
Total Selenium (Se)	µg/L	1	1	<1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	9300	7200	10900	9380	7800
Total Strontium (Sr)	µg/L	---	21000	10	8	13	12.3	12
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	<2	<2	<2	<2.0	<3
Total Uranium (U)	µg/L	15 (33)[1]	15	0.13	0.1	0.2	0.16	0.2
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**7.9**	6	<5	<5.0	<5
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Parameters	Units	Comparison Criteria		FBWHT SW4 Trinity Road				
Comments		CCME FAL[1]	NS EQS[2]	6-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	311		219		129
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	6.51		6.59		
Specific Conductance	umho/cm	---	---			337.2		259
Field Temperature	°C	---	---	21.28		8.6		21.3
Colour	TCU	---	---			231.1		
Dissolved Oxygen % Saturation	%	---	---	21.9		108		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	1.94		12.5		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	**6.41**	**6.19**	6.69	6.8	**6.43**
Reactive Silica (SiO_2)	mg/L	---	---	3.7	3.1	3.2	3.6	10.8
Chloride (Cl)	mg/L	120 (640)[1]	120	**130**	**138**	80	92	53
Fluoride (F)	mg/L	0.12	0.12	n/a	**0.2**	<0.12	n/a	0.12
Sulphate (SO_4)	mg/L	---	128	27	21	21	20	13
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<1	<5	5	10	10
Colour	TCU	---	---	11	25	41	46	99.9
Turbidity	NTU	narrative	---	0.63	4.7	3.1	2	1.09
Conductivity	µS/cm	---	---	500	505	334	380	262
Nitrite + Nitrate	mg/L	---	---	0.12	0.37	0.14	0.34	0.33
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.12	0.37	0.14	0.34	0.33
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	<0.03	0.08	0.03
Total Organic Carbon (C)	mg/L	---	---	2.5	4	7.5	6.2	12.7
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	0.99
Total Suspended Solids (TSS)	mg/L	narrative	---	1.2	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	43	46	34.9	38	29.1
Lab Calculated Parameters								
Anion Sum	me/L	---	---	4.29	4.36	2.8	3.24	1.99
Cation Sum	me/L	---	---	3.98	4.79	2.9	3.09	2.34
Ion Balance (% Difference)	%	---	---	3.75	4.7	1.7	2.37	8.1
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<5	5	10	10
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	250	267	168	191	125
Langelier Index (@ 20C)	-	---	---	nc	-3.54	-3.2	-2.49	-3.21
Langelier Index (@ 4C)	-	---	---	nc	-3.86	-3.52	-2.74	-3.53
Saturation pH (@ 20C)	-	---	---	nc	9.73	9.89	9.29	9.64
Saturation pH (@ 4C)	-	---	---	nc	7.1	10.2	9.54	9.96
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	96	80	5	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>250	280	14	n/a	n/a
E. Coli	CFU/100mL	---	---	80	45	2	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**50**	**279**	**240**	**187**	**288**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	30	32	23	23.4	17
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	9	12	<50	11
Total Cadmium (Cd)	µg/L	equation[1]	0.09	**0.11**	**0.133**	0.02	0.029	<0.09
Total Calcium (Ca)	µg/L	---	---	14000	15800	10500	12000	9000
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	0.56	**2**	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	2	2	1.6	**3**
Total Iron (Fe)	µg/L	300	300	51	259	**353**	**327**	**365**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	0.6	0.7	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	2200	1600	2100	1990	1600
Total Manganese (Mn)	µg/L	varies [1]	430	150	211	90	99.2	113
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	6	8	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	<100	170	40	<100	1.08
Total Potassium (K)	µg/L	---	---	1400	1000	1400	1410	1400
Total Selenium (Se)	µg/L	1	1	<1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	71000	87200	48900	52300	38400
Total Strontium (Sr)	µg/L	---	21000	55	51	48	48.5	37
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	<2	4	5	3	<3
Total Uranium (U)	µg/L	15 (33)[1]	15	0.14	0.3	0.4	0.46	0.8
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**24**	**28**	**11**	**8.1**	**11**
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	No
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Parameters	Units	Comparison Criteria		FBWHT SW5 South Highway 3					
		CCME FAL[1]	NS EQS[2]	6-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023	22-Aug-2023
Field Measured Parameters									Field Dup
Field TDS	mg/L	---	---	0.122		83.85		40	
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	6.87		**5.86**			
Specific Conductance	umho/cm	---	---			128.9		80	
Field Temperature	°C	---	---	20.06		7.8		21.4	
Colour	TCU	---	---			86.3			
Dissolved Oxygen % Saturation	%	---	---	34		96			
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	3.02		11.3			
General Parameters									
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	**6.46**	**6.3**	6.59	**6.34**	**6.17**	**6.14**
Reactive Silica (SiO_2)	mg/L	---	---	1.5	2.2	2.9	3.4	3	2.9
Chloride (Cl)	mg/L	120 (640)[1]	120	22	31	28	29	14	14
Fluoride (F)	mg/L	0.12	0.12	n/a	**0.2**	<0.12	n/a	<0.12	<0.12
Sulphate (SO_4)	mg/L	---	128	3.8	6	8	6	4	4
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<1	<5	<5	6	5	6
Colour	TCU	---	---	56	71	58	83	38.6	125
Turbidity	NTU	narrative	---	0.41	3.4	4	1.6	0.83	0.75
Conductivity	µS/cm	---	---	89	137	130	120	84	84
Nitrite + Nitrate	mg/L	---	---	0.51	0.26	0.06	0.2	0.11	0.1
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.51	0.26	0.06	0.2	0.11	0.1
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	<0.03	0.06	<0.03	<0.03
Total Organic Carbon (C)	mg/L	---	---	5.5	7.8	10.2	10	16	15.6
Orthophosphate (P)	mg/L	---	---	<0.01	0.03	<0.01	<0.01	0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	<1	n/a	<5	n/a	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	9.7	12.9	15.6	14	10.1	11.5
Lab Calculated Parameters									
Anion Sum	me/L	---	---	0.7	1.02	0.96	1.09	0.59	0.61
Cation Sum	me/L	---	---	0.74	1.2	1.12	1.01	0.78	0.87
Ion Balance (% Difference)	%	---	---	2.78	8.1	7.5	3.81	14.4	18
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<5	<5	6	5	6
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5	<5
Calculated TDS	mg/L	---	---	ND	64	60	65	38	41
Langelier Index (@ 20C)	-	---	---	nc	-3.97	-3.62	-3.6	-4.21	-4.11
Langelier Index (@ 4C)	-	---	---	nc	-4.29	-3.94	-3.85	-4.53	-4.43
Saturation pH (@ 20C)	-	---	---	nc	10.3	10.2	9.94	10.4	10.3
Saturation pH (@ 4C)	-	---	---	nc	10.6	10.5	10.2	10.7	10.6
Bacteriogical Parameters									
Fecal Coliforms	CFU/100mL	---	---	100	135	2	n/a	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>250	445	54	n/a	n/a	n/a
E. Coli	CFU/100mL	---	---	70	125	13	n/a	n/a	n/a
Total Metals									
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**130**	**308**	**363**	**288**	**324**	**378**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2	<2
Total Barium (Ba)	µg/L	---	1000	11	16	15	14	10	13
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	8	9	<50	7	86
Total Cadmium (Cd)	µg/L	equation[1]	0.09	**0.26**	0.03	0.023	0.029	<0.09	<0.09
Total Calcium (Ca)	µg/L	---	---	2800	4000	4600	3950	2900	3300
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2	<2
Total Cobalt (Co)	µg/L	---	1	**4.8**	<1	<1	<0.40	<1	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	1	**3**	1.17	<2	<2
Total Iron (Fe)	µg/L	300	300	180	281	**348**	**313**	**361**	**403**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	0.8	0.8	<0.50	<0.5	**5.2**
Total Magnesium (Mg)	µg/L	---	---	670	700	1000	887	700	800
Total Manganese (Mn)	µg/L	varies [1]	430	29	61	47	38	43	42
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	12	2	<2	<2.0	<2	<2
Total Phosphorus (P)	µg/L	---	---	<100	180	40	<100	0.82	0.92
Total Potassium (K)	µg/L	---	---	680	700	900	729	800	1000
Total Selenium (Se)	µg/L	1	1	<1	<1	<1	<0.50	<1	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1
Total Sodium (Na)	µg/L	---	---	12000	20100	16700	16100	11700	12800
Total Strontium (Sr)	µg/L	---	21000	110	18	20	17.8	14	15
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2	<2
Total Titanium (Ti)	µg/L	---	---	<2	4	8	2.1	<3	3
Total Uranium (U)	µg/L	15 (33)[1]	15	0.15	0.3	0.3	0.27	0.3	0.3
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**9.8**	**11**	7	5.2	<5	**12**
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a	n/a
Hydrocarbons									
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Comments / Parameters	Units	Comparison Criteria		FBWHT SW6 Lakeside Industrial Park				
		CCME FAL[1]	NS EQS[2]	11-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	419		249		160
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	**6.41**		6.93		
Specific Conductance	umho/cm	---	---			382.6		321
Field Temperature	°C	---	---	20.84		8.2		20.9
Colour	TCU	---	---			259.4		
Dissolved Oxygen % Saturation	%	---	---	19.5		106		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	1.72		12.4		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	6.85	**6.17**	6.71	6.95	**6.33**
Reactive Silica (SiO_2)	mg/L	---	---	5.6	4	4.6	4.9	2.3
Chloride (Cl)	mg/L	120 (640)[1]	120	**230**	**251**	82	93	61
Fluoride (F)	mg/L	0.12	0.12	n/a	**0.3**	**0.14**	n/a	**0.16**
Sulphate (SO_4)	mg/L	---	128	33	41	39	32	23
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	18	<5	<5	14	13
Colour	TCU	---	---	30	<5	13	15	111
Turbidity	NTU	narrative	---	2	3.1	3.8	2.2	2.41
Conductivity	µS/cm	---	---	980	893	374	410	319
Nitrite + Nitrate	mg/L	---	---	0.22	0.37	0.32	0.82	0.62
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.22	0.37	0.32	0.82	0.62
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	0.04	0.07	<0.03
Total Organic Carbon (C)	mg/L	---	---	2.3	2	5.4	4.2	6
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	1.8	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	83	82.9	53.3	55	42.8
Lab Calculated Parameters								
Anion Sum	me/L	---	---	7.55	7.96	3.15	3.62	2.5
Cation Sum	me/L	---	---	7.88	8.71	3.32	3.55	2.97
Ion Balance (% Difference)	%	---	---	2.14	4.5	2.7	0.98	8.6
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	18	<5	<5	14	13
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	460	488	194	219	159
Langelier Index (@ 20C)	-	---	---	-1.95	-3.33	-3.01	-2.07	-3.05
Langelier Index (@ 4C)	-	---	---	-2.2	-3.65	-3.33	-2.32	-3.37
Saturation pH (@ 20C)	-	---	---	8.8	9.5	9.72	9.02	9.38
Saturation pH (@ 4C)	-	---	---	9.05	9.82	10	9.27	9.7
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	160	20	70	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>2500	20	30	n/a	n/a
E. Coli	CFU/100mL	---	---	350	5	24	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**64**	**255**	**348**	**181**	**236**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	46	49	28	24.2	20
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	10	14	<50	17
Total Cadmium (Cd)	µg/L	equation[1]	0.09	**0.14**	**0.242**	0.075	0.039	<0.09
Total Calcium (Ca)	µg/L	---	---	26000	28600	15900	16900	13000
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	**4.8**	**5**	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	<2	2	2	1.66	2
Total Iron (Fe)	µg/L	300	300	**1200**	182	224	227	**350**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	<0.5	<0.5	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	4600	2800	3300	3030	2500
Total Manganese (Mn)	µg/L	varies [1]	430	**1200**	**509**	94	77.5	122
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	12	16	6	3	3
Total Phosphorus (P)	µg/L	---	---	<100	140	30	<100	1.5
Total Potassium (K)	µg/L	---	---	2200	1500	1700	1750	1900
Total Selenium (Se)	µg/L	1	1	<1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	140000	160000	49600	55200	46600
Total Strontium (Sr)	µg/L	---	21000	110	99	66	64.5	50
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	<2	4	3	3.1	5
Total Uranium (U)	µg/L	15 (33)[1]	15	0.15	0.2	0.6	0.47	0.8
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**36**	**45**	**22**	**13.6**	**12**
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Comments / Parameters	Units	Comparison Criteria		FBWHT SW7 Kingswood Subdivision				
		CCME FAL[1]	NS EQS[2]	11-Aug-2014	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters								
Field TDS	mg/L	---	---	39		39.65		18
Field pH	pH units	6.5 - 9.0	6.5 - 9.0	7.24		**6.14**		
Specific Conductance	umho/cm	---	---			61.1		34
Field Temperature	°C	---	---	19.84		7.6		20.2
Colour	TCU	---	---			40.1		
Dissolved Oxygen % Saturation	%	---	---	43.1		94		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---	3.92		11.3		
General Parameters								
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	**6.38**	**5.68**	**5.73**	**5.56**	**5.94**
Reactive Silica (SiO_2)	mg/L	---	---	1.6	1.7	3.5	3.4	3.6
Chloride (Cl)	mg/L	120 (640)[1]	120	13	7	12	12	6
Fluoride (F)	mg/L	0.12	0.12	n/a	<0.1	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	<2	2	3	<2	<2
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<1	<5	<5	<5	15
Colour	TCU	---	---	89	110	77	100	99.7
Turbidity	NTU	narrative	---	0.33	3.5	0.8	1.8	<0.50
Conductivity	µS/cm	---	---	58	41	60	52	40
Nitrite + Nitrate	mg/L	---	---	<0.05	<0.05	<0.05	0.05	<0.05
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	<0.05	<0.05	<0.05	0.05	<0.05
Nitrite (N)	mg/L	0.06	0.06	<0.01	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	n/a	<0.03	<0.03	<0.05	<0.03
Total Organic Carbon (C)	mg/L	---	---	6.9	11.4	14.7	12	19.4
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	<1	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	7.7	5.6	8.2	8	6.6
Lab Calculated Parameters								
Anion Sum	me/L	---	---	0.36	0.24	0.4	0.34	0.47
Cation Sum	me/L	---	---	0.51	0.38	0.58	0.51	0.46
Ion Balance (% Difference)	%	---	---	17.2	22.2	18.1	20	1.5
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<5	<5	<1	15
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<1	<10	<10	<1	<10
Hydroxide	mg/L	---	---	n/a	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	26	17	27	26	24
Langelier Index (@ 20C)	-	---	---	nc	-4.93	-4.74	NC	-4.15
Langelier Index (@ 4C)	-	---	---	nc	-5.25	-5.06	NC	-4.47
Saturation pH (@ 20C)	-	---	---	nc	10.6	10.5	NC	10.1
Saturation pH (@ 4C)	-	---	---	nc	10.9	10.8	NC	10.4
Bacteriogical Parameters								
Fecal Coliforms	CFU/100mL	---	---	1	25	2	n/a	n/a
Total Coliforms	CFU/100mL	---	---	>2500	255	4	n/a	n/a
E. Coli	CFU/100mL	---	---	<10	10	1	n/a	n/a
Total Metals								
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**170**	**292**	**349**	**306**	**391**
Total Antimony (Sb)	µg/L	---	9	<1	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<1	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	7	7	9	8	7
Total Beryllium (Be)	µg/L	---	0.15	<1	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	<50	8	8	<50	6
Total Cadmium (Cd)	µg/L	equation[1]	0.09	0.05	<0.017	<0.017	0.018	<0.09
Total Calcium (Ca)	µg/L	---	---	2100	1600	2300	2050	1800
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	<0.4	<1	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	**2.6**	<1	<1	0.52	<2
Total Iron (Fe)	µg/L	300	300	210	229	218	192	**394**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	0.6	<0.5	0.52	<0.5
Total Magnesium (Mg)	µg/L	---	---	590	400	600	597	500
Total Manganese (Mn)	µg/L	varies [1]	430	10	23	22	20.8	31
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	<2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	240	190	30	<100	0.86
Total Potassium (K)	µg/L	---	---	150	400	500	411	500
Total Selenium (Se)	µg/L	1	1	<1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	7700	4800	8100	7710	5800
Total Strontium (Sr)	µg/L	---	21000	9.8	8	11	9.6	9
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	2.9	2	2	<2.0	<3
Total Uranium (U)	µg/L	15 (33)[1]	15	0.13	0.2	0.2	0.17	0.2
Total Vanadium (V)	µg/L	---	120	<2	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**15**	<5	<5	<5.0	<5
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	n/a	<0.013	n/a
Hydrocarbons								
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Parameters	Units	Comparison Criteria		FBWHT SW8 HRM Sewage Treatment Plant			
Comments		CCME FAL[1]	NS EQS[2]	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters							
Field TDS	mg/L	---	---		83.85		42
Field pH	pH units	6.5 - 9.0	6.5 - 9.0		**5.97**		
Specific Conductance	umho/cm	---	---		129		83
Field Temperature	°C	---	---		7.9		21.4
Colour	TCU	---	---		87		
Dissolved Oxygen % Saturation	%	---	---		88		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---		10.4		
General Parameters							
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	**6.38**	**6.37**	**6.41**	**6.16**
Reactive Silica (SiO_2)	mg/L	---	---	2.4	3.1	3.3	2.6
Chloride (Cl)	mg/L	120 (640)[1]	120	47	27	27	14
Fluoride (F)	mg/L	0.12	0.12	**0.2**	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	9	8	6	4
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<5	<5	6	5
Colour	TCU	---	---	58	58	81	125
Turbidity	NTU	narrative	---	5.3	1.7	2.8	0.84
Conductivity	µS/cm	---	---	190	127	120	86
Nitrite + Nitrate	mg/L	---	---	0.52	0.26	0.51	0.17
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.38	0.26	0.5	0.17
Nitrite (N)	mg/L	0.06	0.06	**0.14**	<0.05	0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	0.98	<0.03	0.11	<0.03
Total Organic Carbon (C)	mg/L	---	---	7.4	12.5	9.8	16.1
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	0.02	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	16.5	16.6	15	12.3
Lab Calculated Parameters							
Anion Sum	me/L	---	---	1.55	0.95	1.06	0.59
Cation Sum	me/L	---	---	1.82	1.15	1.15	0.88
Ion Balance (% Difference)	%	---	---	8	9.7	4.07	19.5
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<5	<5	6	5
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<10	<10	<1	<10
Hydroxide	mg/L	---	---	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	98	61	68	41
Langelier Index (@ 20C)	-	---	---	-3.78	-3.8	-3.46	-4.13
Langelier Index (@ 4C)	-	---	---	-4.1	-4.12	-3.72	-4.45
Saturation pH (@ 20C)	-	---	---	10.2	10.2	9.88	10.3
Saturation pH (@ 4C)	-	---	---	10.5	10.5	10.1	10.6
Bacteriogical Parameters							
Fecal Coliforms	CFU/100mL	---	---	190	18	n/a	n/a
Total Coliforms	CFU/100mL	---	---	460	40	n/a	n/a
E. Coli	CFU/100mL	---	---	5	16	n/a	n/a
Total Metals							
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**295**	**342**	**332**	**367**
Total Antimony (Sb)	µg/L	---	9	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<2	<2	<1.0	<2
Total Barium (Ba)	µg/L	---	1000	18	15	15.1	12
Total Beryllium (Be)	µg/L	---	0.15	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	9	11	<50	9
Total Cadmium (Cd)	µg/L	equation[1]	0.09	0.046	0.021	0.02	<0.09
Total Calcium (Ca)	µg/L	---	---	5300	5000	4580	3600
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	<1	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	1	1	1.2	<2
Total Iron (Fe)	µg/L	300	300	266	**341**	**343**	**393**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	0.6	<0.5	<0.50	<0.5
Total Magnesium (Mg)	µg/L	---	---	800	1000	973	800
Total Manganese (Mn)	µg/L	varies [1]	430	62	45	39.5	42
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	200	50	<100	0.94
Total Potassium (K)	µg/L	---	---	800	1000	1050	1000
Total Selenium (Se)	µg/L	1	1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	31100	17000	18200	12600
Total Strontium (Sr)	µg/L	---	21000	22	21	19.2	16
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	4	2	2.9	<3
Total Uranium (U)	µg/L	15 (33)[1]	15	0.4	0.3	0.3	0.3
Total Vanadium (V)	µg/L	---	120	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	**12**	7	6.5	**15**
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	<0.013	n/a
Hydrocarbons							
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Parameters	Units	Comparison Criteria		FBWHT SW9 Timberlea Subdivision			
Comments		CCME FAL[1]	NS EQS[2]	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023
Field Measured Parameters							
Field TDS	mg/L	---	---		108.55		54
Field pH	pH units	6.5 - 9.0	6.5 - 9.0		**6.17**		
Specific Conductance	umho/cm	---	---		167		108
Field Temperature	°C	---	---		7.8		24.5
Colour	TCU	---	---		112.5		
Dissolved Oxygen % Saturation	%	---	---		84		
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---		10		
General Parameters							
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	6.69	6.85	6.79	**6.39**
Reactive Silica (SiO_2)	mg/L	---	---	1	3.9	5	4.5
Chloride (Cl)	mg/L	120 (640)[1]	120	106	36	39	19
Fluoride (F)	mg/L	0.12	0.12	**0.2**	<0.12	n/a	<0.12
Sulphate (SO_4)	mg/L	---	128	9	7	7	4
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	6	9	12	9
Colour	TCU	---	---	23	66	110	11.1
Turbidity	NTU	narrative	---	5.6	3.8	5.5	3.26
Conductivity	µS/cm	---	---	401	165	160	111
Nitrite + Nitrate	mg/L	---	---	0.18	0.26	0.48	<0.05
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.18	0.26	0.48	<0.05
Nitrite (N)	mg/L	0.06	0.06	<0.05	<0.05	<0.01	<0.05
Ammonia (as N)	mg/L	varies [1]	varies [2]	<0.03	0.04	0.12	<0.03
Total Organic Carbon (C)	mg/L	---	---	5.4	11.7	11	17.6
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01
Total Suspended Solids (TSS)	mg/L	narrative	---	n/a	<5	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	27.3	17.8	17	12.8
Lab Calculated Parameters							
Anion Sum	me/L	---	---	3.31	1.36	1.52	0.8
Cation Sum	me/L	---	---	3.79	1.47	1.5	1.19
Ion Balance (% Difference)	%	---	---	6.7	4	0.66	19.5
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	6	9	12	9
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<10	<10	<1	<10
Hydroxide	mg/L	---	---	<5	<5	n/a	<5
Calculated TDS	mg/L	---	---	204	82	93	54
Langelier Index (@ 20C)	-	---	---	-3.21	-3.05	-2.76	-3.64
Langelier Index (@ 4C)	-	---	---	-3.53	-3.37	-3.01	-3.96
Saturation pH (@ 20C)	-	---	---	9.9	9.9	9.54	10
Saturation pH (@ 4C)	-	---	---	10.2	10.2	9.79	10.3
Bacteriogical Parameters							
Fecal Coliforms	CFU/100mL	---	---	115	8	n/a	n/a
Total Coliforms	CFU/100mL	---	---	355	10	n/a	n/a
E. Coli	CFU/100mL	---	---	40	5	n/a	n/a
Total Metals							
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**155**	**332**	**374**	**452**
Total Antimony (Sb)	µg/L	---	9	<2	<2	<1.0	<2
Total Arsenic (As)	µg/L	5	5	<2	<2	1.2	3
Total Barium (Ba)	µg/L	---	1000	34	24	24	18
Total Beryllium (Be)	µg/L	---	0.15	<2	<2	<1.0	<2
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2.0	<2
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	9	12	<50	10
Total Cadmium (Cd)	µg/L	equation[1]	0.09	0.02	<0.017	0.018	<0.09
Total Calcium (Ca)	µg/L	---	---	8800	5300	5300	3800
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1.0	<2
Total Cobalt (Co)	µg/L	---	1	<1	<1	<0.40	<1
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	2	2	**3.13**	**3**
Total Iron (Fe)	µg/L	300	300	**370**	**524**	**627**	**1030**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	0.5	0.8	0.97	0.9
Total Magnesium (Mg)	µg/L	---	---	1300	1100	1010	800
Total Manganese (Mn)	µg/L	varies [1]	430	57	40	75.7	107
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2.0	<2
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	<2	<2.0	<2
Total Phosphorus (P)	µg/L	---	---	190	40	<100	0.92
Total Potassium (K)	µg/L	---	---	1000	1100	1030	1000
Total Selenium (Se)	µg/L	1	1	<1	<1	<0.50	<1
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.10	<0.1
Total Sodium (Na)	µg/L	---	---	73200	23700	25100	18700
Total Strontium (Sr)	µg/L	---	21000	37	24	21.2	17
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.10	<0.1
Total Tin (Sn)	µg/L	---	---	<2	<2	<2.0	<2
Total Titanium (Ti)	µg/L	---	---	2	5	5.1	5
Total Uranium (U)	µg/L	15 (33)[1]	15	0.5	1.1	1.31	2.4
Total Vanadium (V)	µg/L	---	120	<2	<2	<2.0	<2
Total Zinc (Zn)	µg/L	dissolved only	7	6	6	**7.3**	<5
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	<0.013	n/a
Hydrocarbons							
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	<0.001
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	<0.001
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	<0.001
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	<0.002
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	<0.01
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.1
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	<0.1
Sediment		---	---	n/a	n/a	n/a	Trace
Resemblance Comment		---	---	n/a	n/a	n/a	NR
Return to Baseline at C32		---	---	n/a	n/a	n/a	Yes

Table 1: Nine Mile River Surface Water Sampling Results

Comments		Comparison Criteria		FBWHT SW10 Voyageur Estates				incl turbid ditch water SW10A	Field Dup DUP
Parameters	**Units**	**CCME FAL[1]**	**NS EQS[2]**	3-Jun-2015	22-Nov-2016	17-Nov-2020	22-Aug-2023	17-Nov-2020	17-Nov-2020
Field Measured Parameters									
Field TDS	mg/L	---	---		91		49		
Field pH	pH units	6.5 - 9.0	6.5 - 9.0		**6.43**				
Specific Conductance	umho/cm	---	---		140.1		98		
Field Temperature	°C	---	---		6.9		22.00		
Colour	TCU	---	---		91.7				
Dissolved Oxygen % Saturation	%	---	---		73				
Dissolved Oxygen	mg/L	Min 6.5 or 9.5[1]	---		8.8				
General Parameters									
pH (lab measured)	pH	6.5 - 9.0	6.5 - 9.0	6.88	6.96	6.92	**6.36**	6.93	**6.48**
Reactive Silica (SiO_2)	mg/L	---	---	1.1	2.2	1.6	2.6	1.7	3.5
Chloride (Cl)	mg/L	120 (640)[1]	120	31	25	28	17	28	28
Fluoride (F)	mg/L	0.12	0.12	<0.1	<0.12	n/a	<0.12	n/a	n/a
Sulphate (SO_4)	mg/L	---	128	8	7	5	3	5	6
Alkalinity (Total as $CaCO_3$)	mg/L	---	---	<5	14	12	10	12	7
Colour	TCU	---	---	19	31	24	156	25	76
Turbidity	NTU	narrative	---	4	4.7	1	0.67	17	2.2
Conductivity	µS/cm	---	---	143	139	120	101	120	120
Nitrite + Nitrate	mg/L	---	---	0.06	<0.05	0.1	0.06	0.11	0.53
Nitrate (N)	mg/L	2.9 (120)[1]	2.9	0.06	<0.05	0.1	0.06	0.11	0.52
Nitrite (N)	mg/L	0.06	0.06	<0.05	<0.05	<0.01	<0.05	<0.01	0.01
Ammonia (as N)	mg/L	varies [1]	varies [2]	<0.03	<0.03	<0.05	<0.03	0.08	0.13
Total Organic Carbon (C)	mg/L	---	---	4.4	9.9	6.1	9	5.8	9.9
Orthophosphate (P)	mg/L	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Total Suspended Solids (TSS)	mg/L	narrative	---	n/a	<5	n/a	n/a	n/a	n/a
Hardness ($CaCO_3$)	mg/L	---	---	16.6	21.6	16	14.5	18	16
Lab Calculated Parameters									
Anion Sum	me/L	---	---	1.05	1.13	1.14	0.75	1.14	1.09
Cation Sum	me/L	---	---	1.17	1.21	1.09	1.02	1.14	1.1
Ion Balance (% Difference)	%	---	---	5.6	3.6	2.24	15.3	0	0.46
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<5	14	12	10	12	7
Carb. Alkalinity (calc. as $CaCO_3$)	mg/L	---	---	<10	<10	<1	<10	<1	<1
Hydroxide	mg/L	---	---	<5	<5	n/a	<5	n/a	n/a
Calculated TDS	mg/L	---	---	65	67	66	48	67	68
Langelier Index (@ 20C)	-	---	---	-3.29	-2.65	-2.66	-3.59	-2.6	-3.29
Langelier Index (@ 4C)	-	---	---	-3.61	-2.97	-2.91	-3.91	-2.85	-3.54
Saturation pH (@ 20C)	-	---	---	10.2	9.61	9.57	9.95	9.53	9.77
Saturation pH (@ 4C)	-	---	---	10.5	9.93	9.83	10.3	9.78	10
Bacteriogical Parameters									
Fecal Coliforms	CFU/100mL	---	---	125	21	n/a	n/a	n/a	n/a
Total Coliforms	CFU/100mL	---	---	450	75	n/a	n/a	n/a	n/a
E. Coli	CFU/100mL	---	---	65	32	n/a	n/a	n/a	n/a
Total Metals									
Total Aluminum (Al)	µg/L	5 - 100[1]	5 - 100[2]	**213**	**268**	**49.8**	**193**	**796**	**338**
Total Antimony (Sb)	µg/L	---	9	<2	<2	<1.0	<2	<1.0	<1.0
Total Arsenic (As)	µg/L	5	5	<2	<2	<1.0	<2	<1.0	<1.0
Total Barium (Ba)	µg/L	---	1000	11	12	8.5	10	13.1	14.2
Total Beryllium (Be)	µg/L	---	0.15	<2	<2	<1.0	<2	<1.0	<1.0
Total Bismuth (Bi)	µg/L	---	---	<2	<2	<2.0	<2	<2.0	<2.0
Total Boron (B)	µg/L	1500 (29,000)[1]	1500	26	9	<50	353	<50	<50
Total Cadmium (Cd)	µg/L	equation[1]	0.09	<0.017	<0.017	<0.010	<0.09	<0.010	0.021
Total Calcium (Ca)	µg/L	---	---	5000	6500	4760	4000	5030	4870
Total Chromium (Cr)	µg/L	8.91	8.9	<1	<1	<1.0	<2	<1.0	<1.0
Total Cobalt (Co)	µg/L	---	1	<1	<1	<0.40	<1	0.44	<0.40
Total Copper (Cu)	µg/L	2-4[1]	2-4[2]	1	2	0.8	**7**	1.79	1.06
Total Iron (Fe)	µg/L	300	300	266	**308**	71	**412**	**728**	**319**
Total Lead (Pb)	µg/L	1-7[1]	1-7[2]	<0.5	0.7	<0.50	0.7	0.67	<0.50
Total Magnesium (Mg)	µg/L	---	---	1000	1300	1070	1100	1210	898
Total Manganese (Mn)	µg/L	varies [1]	430	34	28	8.8	39	22.4	36.2
Total Molybdenum (Mo)	µg/L	73	73	<2	<2	<2.0	<2	<2.0	<2.0
Total Nickel (Ni)	µg/L	25-150[1]	25-150[2]	<2	<2	<2.0	<2	<2.0	<2.0
Total Phosphorus (P)	µg/L	---	---	150	40	<100	0.92	<100	<100
Total Potassium (K)	µg/L	---	---	800	1600	968	1300	1140	937
Total Selenium (Se)	µg/L	1	1	**2**	<1	<0.50	<1	<0.50	<0.50
Total Silver (Ag)	µg/L	0.25	0.25	<0.1	<0.1	<0.10	<0.1	<0.10	<0.10
Total Sodium (Na)	µg/L	---	---	18000	16100	16900	15000	16700	17100
Total Strontium (Sr)	µg/L	---	21000	19	24	18.4	18	20	18.3
Total Thallium (Tl)	µg/L	0.8	0.8	<0.1	<0.1	<0.10	<0.1	<0.10	<0.10
Total Tin (Sn)	µg/L	---	---	<2	<2	<2.0	<2	<2.0	<2.0
Total Titanium (Ti)	µg/L	---	---	6	6	<2.0	<3	21.4	2.9
Total Uranium (U)	µg/L	15 (33)[1]	15	<0.1	<0.1	<0.10	<0.2	<0.10	0.28
Total Vanadium (V)	µg/L	---	120	<2	<2	<2.0	<2	<2.0	<2.0
Total Zinc (Zn)	µg/L	dissolved only	7	<5	<5	<5.0	**43**	<5.0	6.8
Total Mercury (Hg)	ug/L	0.026	0.026	n/a	n/a	<0.013	n/a	<0.013	<0.013
Hydrocarbons									
Benzene	mg/L	0.37	2.1	n/a	n/a	n/a	<0.001	n/a	n/a
Toluene	mg/L	0.002	0.77	n/a	n/a	n/a	<0.001	n/a	n/a
Ethylbenzene	mg/L	0.09	0.32	n/a	n/a	n/a	<0.001	n/a	n/a
Xylene (Total)	mg/L	---	0.33	n/a	n/a	n/a	<0.002	n/a	n/a
C6-C10 (less BTEX)	mg/L	---	---	n/a	n/a	n/a	<0.01	n/a	n/a
>C10-C16 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05	n/a	n/a
>C16-C21 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.05	n/a	n/a
>C21-C32 Hydrocarbons	mg/L	---	---	n/a	n/a	n/a	<0.1	n/a	n/a
Modified TPH (Tier 1)	mg/L	---	0.1 - 1.5 [2]	n/a	n/a	n/a	<0.1	n/a	n/a
Sediment		---	---	n/a	n/a	n/a	No	n/a	n/a
Resemblance Comment		---	---	n/a	n/a	n/a	NR	n/a	n/a
Return to Baseline at C32		---	---	n/a	n/a	n/a	Yes	n/a	n/a

Notes:

Values in light grey font are below the RDL.

n/a denotes parameter was not analyzed.

nc denotes parameter was not calculated.

NR denoted No Resemblance

Exceedances to the CCME FAL guidelines are shaded.

Exceedances to the NS EQS standards are bolded.

[1] Canadian Council of Ministers of the Environment Freshwater Aquatic Life (CCME FAL) guidelines (as of January 2024 on CCME website)

Values in (brackets) are short-term guidelines.

Ammonia : pH & temperature dependant; consult CCME Fact Sheet

Aluminum Guideline = 5 ug/L at pH < 6.5; or = 100 ug/L at pH ≥ 6.5

Boron : CCME CWQG for the Protection of Freshwater Aquatic Life = 29000 ug/L (short-term); 1500 ug/L (long-term).

Cadmium Guideline = 0.04 ug/L at [$CaCO_3$] <17 mg/L; use equation a [$CaCO_3$] 17 to 280 mg/L; or = 0.37 ug/L at [$CaCO_3$] >280

Chromium Guideline = For trivalent chromium (Cr(III))

Copper Guideline = 2 ug/L at [$CaCO_3$] = 0 - <82 mg/L; = varies at [$CaCO_3$] = 82 - 180 mg/L; or = 4 ug/L at [$CaCO_3$] >180 mg/L; if hardness unknown use 2 ug/L

Lead Guideline: 1 ug/L at [$CaCO_3$] = 0 - 60 mg/L; = varies at [$CaCO_3$] = >60 - 180 mg/L; or = 7 ug/L at [$CaCO_3$] > 180 mg/L; if hardness unknown use 1 ug/L

Manganese : Use the CCME CWQG for the Protection of Freshwater Aquatic Life calculator or table (requires pH & [$CaCO_3$]).

Nickel Guideline = 25 ug/L at [$CaCO_3$] = 0 - 60 mg/L; = varies at [$CaCO_3$] = >60 - 180 mg/L; or 150 ug/L at [$CaCO_3$] >180 mg/L; if hardness unknown use 25 ug/L

Uranium : CCME CWQG for the Protection of Freshwater Aquatic Life = 33 ug/L (short-term); 15 ug/L (long-term).

Dissolved Oxygen = Lowest acceptable concentration in cold water ecosystem = 9.5 mg/L for early life stages, 6.5 mg/L for other life stages.

[2] Nova Scotia Tier 1 Environmental Quality Standards for Contaminated Sites (NS EQS) for Fresh Surface Water (revised 30 September 2021)

Ammonia : pH & temperature dependant; consult CCME Fact Sheet

Aluminum Guideline = 5 ug/L at pH < 6.5; or = 100 ug/L at pH ≥ 6.5

Copper Guideline = 2 ug/L at [$CaCO_3$] = 0 - <82 mg/L; = varies at [$CaCO_3$] = 82 - 180 mg/L; or = 4 ug/L at [$CaCO_3$] >180 mg/L; if hardness unknown use 2 ug/L

Lead Guideline: 1 ug/L at [$CaCO_3$] = 0 - 60 mg/L; = 2 ug/L at [$CaCO_3$] = >60 - 120 mg/L; = 4 ug/L at [CaCO3] = >120 - 180 mg/L; or = 7 ug/L at [$CaCO_3$] > 180 mg/L; if hardness unknown use 1 ug/L

Nickel Guideline = 25 ug/L at [$CaCO_3$] = 0 - 60 mg/L; = 65 ug/L at [$CaCO_3$] = >60 - 120 mg/L; = 110 ug/L at [CaCO3] = >120 - 180 mg/L; or 150 ug/L at [$CaCO_3$] >180 mg/L; if hardness unknown use 25 ug/L

Modified TPH Standard = 1.5 mg/L for Gas; = 0.1 mg/L for Fuel; = 0.1 mg/L for Lube

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CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST
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(902) 448-4084
ATTENTION TO: BRIDGET ADAMS
PROJECT:
AGAT WORK ORDER: 23X060399
TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician
WATER ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
DATE REPORTED: Sep 01, 2023
PAGES (INCLUDING COVER): 17
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

Disclaimer:

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

		SAMPLE DESCRIPTION:		FBWHT SW1	FBWHT SW2	FBWHT SW3	FBWHT SW4	FBWHT SW5	FBWHT SW6	FBWHT SW7	FBWHT SW8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22
Parameter	**Unit**	**G / S**	**RDL**	**5230897**	**5230899**	**5230900**	**5230901**	**5230902**	**5230903**	**5230904**	**5230905**
Benzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sediment				TRACE	TRACE	TRACE	NO	TRACE	TRACE	TRACE	TRACE
Resemblance Comment				NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130		104	101	108	107	105	104	105	108
Isobutylbenzene - VPH	%	70-130		77	84	84	83	82	76	78	79
n-Dotriacontane - EPH	%	70-130		104	100	109	109	108	108	106	109

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

		SAMPLE DESCRIPTION:		FBWHT SW9	FBWHT SW10	FBWHT DUP
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-08-22	2023-08-22	2023-08-22
Parameter	**Unit**	**G / S**	**RDL**	**5230906**	**5230907**	**5230908**
Benzene	mg/L		0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1
Sediment				TRACE	NO	TRACE
Resemblance Comment				NR	NR	NR
Return to Baseline at C32				Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**				
Isobutylbenzene - EPH	%	70-130		109	105	109
Isobutylbenzene - VPH	%	70-130		77	81	82
n-Dotriacontane - EPH	%	70-130		109	104	110

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AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5230897-5230908 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

		SAMPLE DESCRIPTION:		FBWHT SW1	FBWHT SW2	FBWHT SW3	FBWHT SW4	FBWHT SW5	FBWHT SW6	FBWHT SW7	FBWHT SW8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22
Parameter	Unit	G / S	RDL	5230897	5230899	5230900	5230901	5230902	5230903	5230904	5230905
pH				6.52	6.48	6.16	6.43	6.17	6.33	5.94	6.16
Reactive Silica as SiO2	mg/L		0.5	1.3	<0.5	14.7	10.8	3.0	2.3	3.6	2.6
Chloride	mg/L		1	18	18	8	53	14	61	6	14
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	0.12	<0.12	0.16	<0.12	<0.12
Sulphate	mg/L		2	2	6	2	13	4	23	<2	4
Alkalinity	mg/L		5	11	16	5	10	5	13	15	5
True Color	TCU		5.00	142	<5.00	17.0	99.9	38.6	111	99.7	125
Turbidity	NTU		0.50	2.79	0.77	0.90	1.09	0.83	2.41	<0.50	0.84
Electrical Conductivity	umho/cm		1	115	137	55	262	84	319	40	86
Nitrate + Nitrite as N	mg/L		0.05	<0.05	0.18	<0.05	0.33	0.11	0.62	<0.05	0.17
Nitrate as N	mg/L		0.05	<0.05	0.18	<0.05	0.33	0.11	0.62	<0.05	0.17
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.07	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	31.4	9.3	15.9	12.7	16.0	6.0	19.4	16.1
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	0.98	0.99	0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	16.2	17.2	7.8	38.4	11.7	46.6	5.8	12.6
Total Potassium	mg/L		0.1	2.0	1.9	0.9	1.4	0.8	1.9	0.5	1.0
Total Calcium	mg/L		0.1	4.0	7.0	2.4	9.0	2.9	13.0	1.8	3.6
Total Magnesium	mg/L		0.1	1.1	1.5	0.6	1.6	0.7	2.5	0.5	0.8
Bicarb. Alkalinity (as CaCO3)	mg/L		5	11	16	5	10	5	13	15	5
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	52	63	25	125	38	159	24	41
Hardness	mg/L			14.5	23.7	8.5	29.1	10.1	42.8	6.6	12.3
Langelier Index (@20C)	NA			-3.40	-3.04	-4.29	-3.21	-4.21	-3.05	-4.15	-4.13
Langelier Index (@ 4C)	NA			-3.72	-3.36	-4.61	-3.53	-4.53	-3.37	-4.47	-4.45
Saturation pH (@ 20C)	NA			9.92	9.52	10.4	9.64	10.4	9.38	10.1	10.3
Saturation pH (@ 4C)	NA			10.2	9.84	10.8	9.96	10.7	9.70	10.4	10.6
Anion Sum	me/L			0.77	0.97	0.37	1.99	0.59	2.50	0.47	0.59
Cation sum	me/L			1.13	1.30	0.58	2.34	0.78	2.97	0.46	0.88

Certified By: Ashleigh Dussault

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

		SAMPLE DESCRIPTION:		FBWHT SW1	FBWHT SW2	FBWHT SW3	FBWHT SW4	FBWHT SW5	FBWHT SW6	FBWHT SW7	FBWHT SW8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22	2023-08-22
Parameter	Unit	G / S	RDL	5230897	5230899	5230900	5230901	5230902	5230903	5230904	5230905
% Difference/ Ion Balance	%			19.0	14.7	22.8	8.1	14.4	8.6	1.5	19.5
Total Aluminum	ug/L		5	186	67	331	288	324	236	391	367
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Barium	ug/L		5	9	15	10	17	10	20	7	12
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L		5	7	25	5	11	7	17	6	9
Total Cadmium	ug/L		0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L		2	<2	<2	<2	3	<2	2	<2	<2
Total Iron	ug/L		50	1430	519	393	365	361	350	394	393
Total Lead	ug/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Manganese	ug/L		2	203	65	52	113	43	122	31	42
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	3	<2	<2
Total Phosphorous	mg/L		0.02	0.35	0.86	0.72	1.08	0.82	1.50	0.86	0.94
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	18	32	12	37	14	50	9	16
Total Thallium	ug/L		0.1	<0.1	<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	<2	<2
Total Titanium	ug/L		3	3	<3	<3	<3	<3	5	<3	<3
Total Uranium	ug/L		0.2	<0.2	<0.2	0.2	0.8	0.3	0.8	0.2	0.3
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Zinc	ug/L		5	<5	<5	<5	11	<5	12	<5	15

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: FBWHT SW9 SAMPLE TYPE: Water DATE SAMPLED: 2023-08-22 5230906	FBWHT SW10 Water 2023-08-22 5230907	FBWHT DUP Water 2023-08-22 5230908
pH				6.39	6.36	6.14
Reactive Silica as SiO2	mg/L		0.5	4.5	2.6	2.9
Chloride	mg/L		1	19	17	14
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	4	3	4
Alkalinity	mg/L		5	9	10	6
True Color	TCU		5.00	11.1	156	125
Turbidity	NTU		0.50	3.26	0.67	0.75
Electrical Conductivity	umho/cm		1	111	101	84
Nitrate + Nitrite as N	mg/L		0.05	<0.05	0.06	0.10
Nitrate as N	mg/L		0.05	<0.05	0.06	0.10
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	17.6	9.0	15.6
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	18.7	15.0	12.8
Total Potassium	mg/L		0.1	1.0	1.3	1.0
Total Calcium	mg/L		0.1	3.8	4.0	3.3
Total Magnesium	mg/L		0.1	0.8	1.1	0.8
Bicarb. Alkalinity (as CaCO3)	mg/L		5	9	10	6
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5
Calculated TDS	mg/L		1	54	48	41
Hardness	mg/L			12.8	14.5	11.5
Langelier Index (@20C)	NA			-3.64	-3.59	-4.11
Langelier Index (@ 4C)	NA			-3.96	-3.91	-4.43
Saturation pH (@ 20C)	NA			10.0	9.95	10.3
Saturation pH (@ 4C)	NA			10.3	10.3	10.6
Anion Sum	me/L			0.80	0.75	0.61
Cation sum	me/L			1.19	1.02	0.87

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Certificate of Analysis

AGAT WORK ORDER: 23X060399

PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-22

DATE REPORTED: 2023-09-01

		SAMPLE DESCRIPTION:		FBWHT SW9	FBWHT SW10	FBWHT DUP
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-08-22	2023-08-22	2023-08-22
Parameter	Unit	G / S	RDL	5230906	5230907	5230908
% Difference/ Ion Balance	%			19.5	15.3	18.0
Total Aluminum	ug/L		5	452	193	378
Total Antimony	ug/L		2	<2	<2	<2
Total Arsenic	ug/L		2	3	<2	<2
Total Barium	ug/L		5	18	10	13
Total Beryllium	ug/L		2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2
Total Boron	ug/L		5	10	353	86
Total Cadmium	ug/L		0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L		2	<2	<2	<2
Total Cobalt	ug/L		1	<1	<1	<1
Total Copper	ug/L		2	3	7	<2
Total Iron	ug/L		50	1030	412	403
Total Lead	ug/L		0.5	0.9	0.7	5.2
Total Manganese	ug/L		2	107	39	42
Total Molybdenum	ug/L		2	<2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2
Total Phosphorous	mg/L		0.02	0.92	0.92	0.92
Total Selenium	ug/L		1	<1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	17	18	15
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2
Total Titanium	ug/L		3	5	<3	3
Total Uranium	ug/L		0.2	2.4	<0.2	0.3
Total Vanadium	ug/L		2	<2	<2	<2
Total Zinc	ug/L		5	<5	43	12

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PROJECT:

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-22 **DATE REPORTED: 2023-09-01**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5230897-5230899 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Ion Balance is biased high, contributing parameters have been confirmed.

5230900 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

5230901 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

5230902 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

5230903 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

5230904-5230905 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

5230906-5230907 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
Ion Balance is biased high, contributing parameters have been confirmed.

5230908 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

Analysis performed at AGAT Halifax (unless marked by *)

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Quality Assurance

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 01, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)															
Benzene	1	5230897	< 0.001	< 0.001	NA	< 0.001	91%	70%	130%	85%	70%	130%			
Toluene	1	5230897	< 0.001	< 0.001	NA	< 0.001	86%	70%	130%	75%	70%	130%			
Ethylbenzene	1	5230897	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	70%	70%	130%			
Xylene (Total)	1	5230897	< 0.002	< 0.002	NA	< 0.002	87%	70%	130%	78%	70%	130%			
C6-C10 (less BTEX)	1	5230897	< 0.01	< 0.01	NA	< 0.01	94%	70%	130%	85%	70%	130%	72%	70%	130%
>C10-C16 Hydrocarbons	1	5230897	< 0.05	< 0.05	NA	< 0.05	96%	70%	130%	98%	70%	130%	96%	70%	130%
>C16-C21 Hydrocarbons	1	5230897	< 0.05	< 0.05	NA	< 0.05	106%	70%	130%	98%	70%	130%	96%	70%	130%
>C21-C32 Hydrocarbons	1	5230897	< 0.1	< 0.1	NA	< 0.1	122%	70%	130%	98%	70%	130%	96%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on a different sample than the duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

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Quality Assurance

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Sep 01, 2023

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals															
pH	5230901	5230901	6.43	6.32	1.7%	<	101%	80%	120%	NA			NA		
Reactive Silica as SiO2	5226878		6.2	6.7	8.3%	< 0.5	NA	80%	120%	NA	80%	120%	116%	80%	120%
Chloride	5231296		4	4	NA	< 1	82%	80%	120%	NA	80%	120%	83%	70%	130%
Fluoride	5231296		0.26	0.30	NA	< 0.12	98%	80%	120%	NA	80%	120%	102%	70%	130%
Sulphate	5231296		5	6	NA	< 2	95%	80%	120%	NA	80%	120%	85%	70%	130%
Alkalinity	5230901	5230901	10	8	NA	< 5	118%	80%	120%	NA			NA		
True Color	5226878		<5.00	<5.00	NA	< 5	84%	80%	120%	105%	80%	120%	NA		
Turbidity	5230901	5230901	1.09	0.97	NA	< 0.5	NA	80%	120%	NA			NA		
Electrical Conductivity	5230901	5230901	262	262	0.0%	< 1	97%	90%	110%	NA			NA		
Nitrate as N	5231296		0.08	0.07	NA	< 0.05	93%	80%	120%	NA	80%	120%	78%	70%	130%
Nitrite as N	5231296		<0.05	<0.05	NA	< 0.05	93%	80%	120%	NA	80%	120%	89%	70%	130%
Ammonia as N	5231296		<0.03	<0.03	NA	< 0.03	100%	80%	120%	99%	80%	120%	109%	70%	130%
Total Organic Carbon	1		<0.5	<0.5	NA	< 0.5		80%	120%		80%	120%		80%	120%
Ortho-Phosphate as P	5226878		0.05	0.04	NA	< 0.01	108%	80%	120%	99%	80%	120%	109%	80%	120%
Total Sodium	5236298		7.4	7.6	3.0%	< 0.1	99%	80%	120%	99%	80%	120%	122%	70%	130%
Total Potassium	5236298		0.9	0.9	1.3%	<0.1	99%	80%	120%	101%	80%	120%	103%	70%	130%
Total Calcium	5236298		9.6	9.8	1.4%	<0.1	101%	80%	120%	102%	80%	120%	126%	70%	130%
Total Magnesium	5236298		1.1	1.2	3.9%	< 0.1	100%	80%	120%	104%	80%	120%	106%	70%	130%
Bicarb. Alkalinity (as CaCO3)	5230901	5230901	10	8	NA	< 5	NA	80%	120%	NA			NA		
Carb. Alkalinity (as CaCO3)	5230901	5230901	<10	<10	NA	< 10	NA	80%	120%	NA			NA		
Hydroxide	5230901	5230901	<5	<5	NA	< 5	NA	80%	120%	NA			NA		
Total Aluminum	5236298		270	284	5.3%	< 5	95%	80%	120%	95%	80%	120%	NA	70%	130%
Total Antimony	5236298		<2	<2	NA	< 2	97%	80%	120%	95%	80%	120%	93%	70%	130%
Total Arsenic	5236298		<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	96%	70%	130%
Total Barium	5236298		<5	<5	NA	< 5	97%	80%	120%	94%	80%	120%	96%	70%	130%
Total Beryllium	5236298		<2	<2	NA	< 2	110%	80%	120%	NA	80%	120%	117%	70%	130%
Total Bismuth	5236298		<2	<2	NA	< 2	102%	80%	120%	NA	80%	120%	99%	70%	130%
Total Boron	5236298		<5	<5	NA	< 5	98%	80%	120%	92%	80%	120%	115%	70%	130%
Total Cadmium	5236298		0.09	0.09	NA	< 0.09	100%	80%	120%	100%	80%	120%	95%	70%	130%
Total Chromium	5236298		<2	<2	NA	< 1	101%	80%	120%	98%	80%	120%	98%	70%	130%
Total Cobalt	5236298		<1	<1	NA	< 1	100%	80%	120%	99%	80%	120%	97%	70%	130%
Total Copper	5236298		3	3	NA	< 1	101%	80%	120%	100%	80%	120%	97%	70%	130%
Total Iron	5236298		1430	1460	2.7%	< 50	101%	80%	120%	100%	80%	120%	NA	70%	130%
Total Lead	5236298		5.1	5.2	2.4%	< 0.5	100%	80%	120%	99%	80%	120%	98%	70%	130%
Total Manganese	5236298		389	403	3.5%	< 2	100%	80%	120%	103%	80%	120%	NA	70%	130%
Total Molybdenum	5236298		3	3	NA	< 2	96%	80%	120%	92%	80%	120%	94%	70%	130%
Total Nickel	5236298		<2	<2	NA	< 2	101%	80%	120%	98%	80%	120%	98%	70%	130%
Total Phosphorous	5236298		3.95	4.13	4.5%	< 0.02	105%	80%	120%	87%	80%	120%	NA	70%	130%
Total Selenium	5236298		<1	<1	NA	< 1	103%	80%	120%	103%	80%	120%	99%	70%	130%

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Quality Assurance

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 01, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Silver	5236298		<0.1	<0.1	NA	< 0.1	131%	80%	120%	NA	80%	120%	123%	70%	130%
Total Strontium	5236298		20	21	NA	< 5	99%	80%	120%	100%	80%	120%	104%	70%	130%
Total Thallium	5236298		<0.1	<0.1	NA	< 0.1	98%	80%	120%	99%	80%	120%	95%	70%	130%
Total Tin	5236298		<2	<2	NA	< 2	98%	80%	120%	95%	80%	120%	95%	70%	130%
Total Titanium	5236298		11	13	NA	< 2	99%	80%	120%	99%	80%	120%	101%	70%	130%
Total Uranium	5236298		14.3	14.6	2.3%	< 0.2	99%	80%	120%	96%	80%	120%	99%	70%	130%
Total Vanadium	5236298		<2	<2	NA	< 2	99%	80%	120%	98%	80%	120%	98%	70%	130%
Total Zinc	5236298		882	904	2.4%	< 5	99%	80%	120%	96%	80%	120%	NA	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.
Certified Reference Material: More than 90% of the elements met acceptance limits and overall data quality is acceptable for use. For a multi-element scan up to 10% of analytes may exceed the quoted limits by up to 10% absolute.

Certified By: Ashleigh Drysdale

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QC Exceedance

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

RPT Date: Sep 01, 2023

PARAMETER	Sample Id	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals										
Total Silver		131%	80%	120%	NA	80%	120%	123%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.
Certified Reference Material: More than 90% of the elements met acceptance limits and overall data quality is acceptable for use. For a multi-element scan up to 10% of analytes may exceed the quoted limits by up to 10% absolute.

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Method Summary

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Sediment			GC/MS/FID
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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Method Summary

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6008	SM 2120 B	LACHAT FIA
Turbidity	INOR-121-6001	SM 2130 B	PC TITRATE
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: FIVE BRIDGES WILDERNESS HERITAGE TRUST

AGAT WORK ORDER: 23X060399

PROJECT:

ATTENTION TO: BRIDGET ADAMS

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 15.4, 16.1, 17.3
Hold Time:
AGAT Job Number: 23X060399
Notes:

Report Information
Company: Five Bridges Wilderness Heritage Trust
Contact: B. Adams
Address:
Phone: 902-448-4084 Fax:
Client Project #:
AGAT Quotation: 833098
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: B. Adams
Email: we3bytheseaoutlook.com
2. Name: FBWHT
Email: fbwhtb@gmail.com

Report Format
☐ Single Sample per page
☒ Multiple Samples per page
☒ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☒ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: 23 AUG 22 3:36pm 5pm

Invoice To Same Yes ☒ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☒ List Guidelines on Report ☐ Do not list Guidelines on Report
☒ PIRI
☒ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☒ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☒ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment
FBWHT SW1	22 AUG 2023	SW	8	All samples between ~20°C & ~24°C at time of sampling
FBWHT SW2				
FBWHT SW3				
FBWHT SW4				
FBWHT SW5				
FBWHT SW6				
FBWHT SW7				
FBWHT SW8				
FBWHT SW9				
FBWHT SW10				
FBWHT DUP				

Field Filtered/Preserved	Standard Water Analysis	Metals: ■ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
N/A	X	X								X												

Samples Relinquished By (Print Name): B. Adams
Samples Relinquished By (Sign):
Date/Time: 3:35pm 22 AUG 2023
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time:
Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 1
N°: