January 21, 2021

Nova Scotia Lands Inc.
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Attention: Cory MacPhee, P.Eng.
Project Manager

Long-Term Maintenance and Monitoring
Semi-Annual Surface Water Quality Monitoring Program – Fall 2020
Final Report

Following completion of the Sydney Tar Ponds and Coke Ovens Remediation Project, surface water quality monitoring was implemented as part of a long-term maintenance and monitoring (LTMM) program to provide ongoing data and compliance commitments to regulatory agencies and/or stakeholders. Nova Scotia Lands Inc. ("NSLI") is a Crown Corporation of the Province of Nova Scotia responsible for the LTMM semi-annual surface water quality program. NSLI retained Dillon Consulting Limited ("Dillon") to conduct the fall (December 2020) LTMM Surface Water Quality Monitoring Program, the details of which are provided herein.

Project Methodology

The fall 2020 Surface Water Quality Monitoring Program, which was completed on December 1, 2020, was planned to include the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) (see Figure 1). Surface water samples were not collected at one (i.e., COB-A-SW) of the ten stations, as this location was found to have standing water with no flow.

A GPS unit was used to confirm that the monitoring locations sampled as part of the fall 2020 LTMM surface water quality monitoring program were the same as those used during historical surface water monitoring events (i.e., historical LTMM events and the Environmental Effects Monitoring and Surface Water Monitoring (EEMSWM) Program associated with the Sydney Tar Ponds remediation and past LTMM program events). Tasks associated with the fall 2020 Surface Water Monitoring Program included:

- Documenting ecological activity in the surface water bodies, if observed;
- Recording physical conditions and potential contaminants (i.e., debris, precipitate);
- Measurement of field parameters (i.e., pH, conductivity, temperature, salinity and turbidity);

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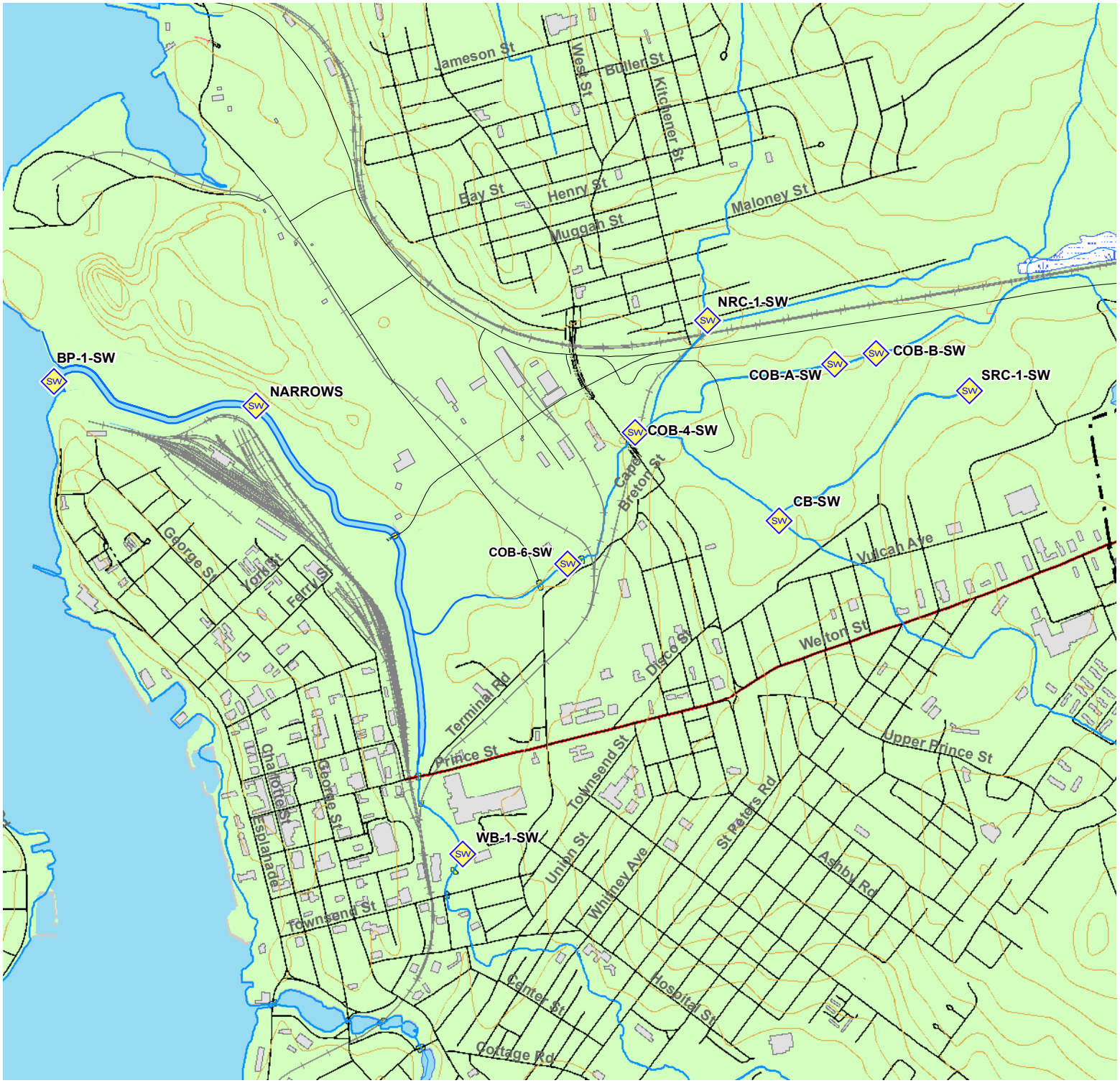

NS Lands
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LONG TERM MAINTENANCE
AND MONITORING
SURFACE WATER QUALITY MONITORING PROGRAM
November 2018

SURFACE WATER LOCATIONS 2020

FIGURE 1

SW Surface Water Locations

0 100 200 400 600 m

MAP DRAWING INFORMATION:
Province of Nova Scotia Mapping

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

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PROJECT: 20-2862

Date: 2020-12-08

Document Path: G:\GIS\141360\NSLI Figures\Surface Water\Figure 1 Surface Water 2020.mxd

- Flow calculation; and
- Collection of surface water samples for polycyclic aromatic hydrocarbons (PAHs), general chemistry and total metals (including mercury) (RCApMS) analysis.

A summary of the surface water stations included in the fall 2020 Monitoring Program is presented in Table 1.

Table 1: Surface Water Quality Monitoring Stations

Monitoring Station ID	Water Body	Rationale for Sampling
CB-SW	Cagney Brook	To characterize surface water quality within the urban area of Sydney upstream of CO7/CO8[1].
NRC-1-SW	North Realigned Channel	To characterize surface water quality within the urban area of Whitney Pier upstream of CO7/CO8.
SRC-1-SW	South Realigned Channel	To characterize surface water quality related to runoff from the municipal landfill upstream of CO7/CO8.
COB-A-SW	Coke Ovens Brook - concrete riffles upstream of Stable Drive	To characterize surface water quality from runoff and leachate associated with the municipal landfill upstream of CO1[2], CO6[3] and CO7/CO8.
COB-B-SW[4]	Coke Oven Brook along SPAR Road, east of COB-A-SW	To further characterize the potential for impacts from the municipal landfill to COB-A-SW.
COB-4-SW	COB-A-SW	To characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B[5].
COB-6-SW	Coke Ovens Brook	To further characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B.
WB-1-SW	Wash Brook	To characterize surface water quality within the urban area of Sydney upstream of TP6B and TP7[6].
NARROWS	Wash Brook	To characterize surface water quality downgradient of the majority of the remediated sites.

Table 1: Surface Water Quality Monitoring Stations

BP-1-SW[7]	North Channel, Open Hearth Park	To further characterize surface water quality downgradient of the remediation sites and as it discharges to Sydney Harbour.

Notes:
1. CO7/CO8: Collection System (CO7)/Water Treatment Plant (CO8).
2. CO1: Coke Oven Brook.
3. CO6: Surface Cap.
4. Upstream monitoring station COB-B-SW was added to the monitoring program in 2015 to further characterize the potential for impacts from the municipal landfill to COB-A-SW.
5. TP6B: Solidification/Stabilization/Channel.
6. TP7: Tar Ponds Cap.
7. The LTMM location of surface water station BP-1-SW is similar to the location used during Pre-Construction activities associated with the EEM Program, and is approximately 40 meters (m) upstream from the collection point utilized during the Construction period of the EEM Program.

Field data was recorded on site specific electronic data sheets. Stream flow measurements were calculated by measuring the width of the stream at the sampling location and by measuring the depth of the stream at ¼, ½ and ¾ width intervals. The stream flow velocity was also measured at ¼, ½ and ¾ intervals. Using a spreadsheet formula, the approximate stream flow was calculated for each monitoring station. Due to the depth of surface water at the Narrows and BP-1-SW it was not possible to obtain field measurements across the entire channel widths. Dillon personnel collected as much field data at these deeper locations as safely possible (i.e., from the stream banks/shoreline, and from the bridge at the Narrows). The Muggah Creek North Channel Survey (CBCL Limited, October 2014) provided by NSLI was used in calculating the stream flow velocity for BP-1-SW.

Sample containers were pre-labelled by the laboratory with the sample identification, analysis required and the project number. The date and time of sample collection were noted on the sample containers in the field at the time of collection. New nitrile gloves were worn by field staff for each sample to avoid cross-contamination between sampling stations. Samples were collected by opening the container facing upstream. Where samples were collected directly into the sample bottles containing preservative, the container was not fully submerged during sampling to avoid washing the preservative out of the container. The sample bottles for metals analysis contained nitric acid preservative so that dissolved metals remained in solution.

Surface water samples were not collected at one (i.e., COB-A-SW) of the ten stations, as this location was found to have standing water with no flow.

Weather Conditions

Weather information obtained from Environment Canada's climate station at the Sydney Airport indicates that total precipitation recorded for the 30 days preceding the December 1, 2020 surface water monitoring program was approximately 77.1 millimeters (mm). No significant rainfall was recorded on the days preceding the sampling event. No rainfall occurred during the sampling event.

Tidal information obtained from Meteo365 (https://www.tide-forecast.com) for December 1, 2020, indicated a high tide level of 1.02 m and a low tide level of 0.42 m.

Field Observations and Measurements

Observations at the ten surface water stations during the fall 2020 Monitoring Program are summarized in Table 2. Field measurements are summarized in Table 3.

Table 2: Fall 2020 Surface Water Quality Monitoring Field Observations

Monitoring Station ID	Field Observations	Corresponding Photograph Numbers
CB-SW	Vegetation in the brook and on the banks. Plastic and textile debris observed on brook banks.	1 and 2
NRC-1-SW	Vegetation observed in the channel and on the banks. Debris (i.e., plastic, paper, textile, wood varnish container, Styrofoam and metal) observed in the channel and on the channel banks.	3 and 4
SRC-1-SW	Algae observed on the concrete channel bottom and edges. The concrete channel walls have spray painted graffiti visibly dissolving at the high water point. Plastic, Styrofoam and paper debris observed in the channel.	5 and 6
COB-A-SW	Sampling location was observed to have standing water with no flow. Vegetation growth observed on the brook banks and within the brook. Plastic and Styrofoam debris observed on banks.	7 and 8
COB-B-SW	Orange staining observed on stream bed soils and vegetation lining the brook. What appeared to be a manganese sheen was observed near the edges of the brook. The historically observed periodic nearby groundwater seep was dry.	9 and 10
COB-4-SW	Algae and vegetation were observed on rocks in brook. Plastic debris observed on the brook banks.	11 and 12

Table 2: Fall 2020 Surface Water Quality Monitoring Field Observations

COB-6-SW	Vegetation observed along the channel banks and algae observed on the channel bottom. Plastic and Styrofoam debris observed along the brook banks.	13 and 14
WB-1-SW	Algae and vegetation observed in the brook bed and vegetation observed along brook banks.	15 and 16
NARROWS	Snails, seaweed and barnacles observed on the rocks below the high tide water mark. Wood, metal, plastic and fabric debris observed on the channel banks.	17 and 18
BP-1-SW	Seaweed, barnacles, and snails observed on the rocks below the high tide water mark. Wood and plastic debris observed on banks.	19 and 20

Note:
1. Photographs are presented in Appendix A.

Table 3: Fall 2020 Surface Water Quality Monitoring Field Measurements

Monitoring Station ID	pH	Turbidity (NTU)	Conductivity (mS/cm)	Salinity (%)	Stream Flow[1] (m^3/s)
CB-SW	8.97	3.5	0.310	0.07	0.074
NRC-1-SW	9.27	1.9	0.229	0.12	0.066
SRC-1-SW	8.96	6.8	0.533	0.26	0.094
COB-A-SW	STANDING WATER - NO FLOW				
COB-B-SW	8.82	1.9	0.654	0.32	0.018
COB-4-SW	8.89	0	0.668	0.35	0.346
COB-6-SW	8.78	2.3	0.402	0.19	0.156
WB-1-SW	8.76	35	0.147	0.07	0.025
NARROWS	8.88	5.0	37.2	22.87	2.60
BP-1-SW [2]	8.01	7.70	46.1	29.21	0.492

Notes:
1. Stream flow is an approximate calculated value.
2. Collected during low tide conditions.

Regulatory Framework

As specified in Section 4.2, page 21 of the NS Lands LTMM Plan, the remedial criteria used for eight of the ten surface water stations included in the LTMM monitoring program (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW and WB-1-SW) were the Nova Scotia Contaminated Sites Regulations (NS CSRs) Tier I Environmental Quality Standards (EQS) (which came into effect December 6, 2013) for surface water (fresh water) and the Canadian Council of Ministers of the Environment (CCME) for the protection of fresh water aquatic life (FWAL) (accessed online December 2020). Analytical results for the remaining two surface water stations included in the monitoring program (i.e., Narrows and BP-1-SW) were compared to the NS CSRs Tier I EQS for surface water (marine) and the CCME guidelines for the protection of aquatic life (marine).

Additionally, as specified in Section 4.2, page 21 of the NSLI LTMM Plan, analytical results for surface water samples collected at the upstream sampling stations were compared to previously calculated 95% upper confidence limits (UCL) of available Pre-Construction/Baseline analytical data from the EEMSWCM Program associated with the Sydney Tar Ponds remediation. Furthermore, analytical results for the upstream sampling stations were also compared to calculated 95% UCLs of available historical upstream analytical data (i.e., the Upstream Calculated 95% UCL). Analytical results for the two sampling stations near Sydney Harbour were compared to the calculated 95% UCLs of available Pre-Construction/Baseline analytical data for the Battery Point sampling station.

Surface Water Quality Trend Analysis – Mann Kendall

Mann-Kendall analysis is a non-parametric statistic test routinely used to assess concentration trends (e.g., stable, decreasing, fluctuating, or increasing). At least four independent sampling events are required to evaluate surface water quality trends via Mann-Kendall analysis. The Mann-Kendall test procedure starts by comparing the most recent round of water quality data with the results of earlier rounds. Non-detect data values are typically assigned a value that is half the laboratory detection limit. The Mann-Kendall test is not designed to account for seasonal variation in data.

Based on a review of the analytical results from the fall 2020 monitoring event, and historical monitoring events, select parameters, with concentrations above (or historically above) applicable guidelines were selected for Mann-Kendall analysis. These include PAH indicator parameters anthracene, pyrene, and benzo(a)pyrene,

and inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate, and zinc.

In certain situations, Mann-Kendall analysis results may be biased due to elevated laboratory detection limits. Non-detected data on the Mann-Kendall analysis of indicator parameters was identified and Dillon confirmed that the influence of non-detected data is minimal.

Surface Water Results

The surface water quality results for the fall 2020 event, and available post-remediation surface water data, are presented Tables B-1 and B-2, attached in Appendix B. Laboratory certificates of analysis are presented in Appendix C. As stated above, surface water samples were analyzed for PAHs and RCApMS. Samples were delivered to Bureau Veritas Laboratory in Sydney, Nova Scotia for analysis. Bureau Veritas is accredited through the Standard Council of Canada (SCC) and is a member of the Canadian Association for Laboratory Accreditation (CALA).

Review of the fall 2020 data indicates analyzed PAH parameters were non-detect and/or below the comparison criteria. A summary of concentrations of select organic parameters (i.e., naphthalene and benzo(a)pyrene) reported at each station relative to the calculated 95% UCLs is provided in Table 4. There were no PAH exceedances of the relative calculated 95% UCLs during the fall 2020 monitoring event.

Review of the fall 2020 general chemistry and metals results indicates:

- Concentrations of aluminum ranging from 6.4 µg/L to 190 µg/L exceeded the Tier I EQS (fresh water) of 5 µg/L in CB-SW, NRC-1-SW, SRC-1-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW and the duplicate sample of WB-1-SW. The aluminum concentrations of 190 µg/L in SRC-1-SW and 110 µg/L in WB-1-SW also exceeded the CCME FWAL of 100 µg/L (note the field duplicate sample for WB-1-SW did note exceed the CCME FWAL guideline).
- The boron concentrations of 2,600 µg/L and 3,600 µg/L, in the Narrows and BP-1-SW, respectively, exceeded Tier I EQS (marine water) of 1,200 µg/L.
- Cadmium concentrations ranging from 0.011 µg/L to 0.027 µg/L in CB-SW, NRC-1-SW, SRC-1-SW, WB-1-SW and the duplicate sample of WB-1-SW exceeded the Tier I EQS (fresh water) of 0.01 µg/L.
- The iron concentration of 330 ug/L in WB-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 300 ug/L (noting that the concentration in the field duplicate sample was 300 ug/L, which is below the CCME FWAL guideline).

Table 4 - Summary of Organic Surface Water Indicator Parameter Concentrations relative to Calculated 95% (ug/L)												
Parameter	**Pre-Construction/ Baseline Calculated 95% UCL[1]**	**Date**	**Sample Location**									
			CB-SW	**NRC-1-SW**	**SRC-1-SW**	**COB-A-SW**	**COB-B-SW[2]**	**COB-4-SW**	**COB-6-SW**	**WB-1-SW**	**NARROWS**	**BP-1-SW**
Naphthalene	1.8	12-22-14	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	0.22	<0.20
		07-27-15	<0.20	<0.20	<0.20	Dry	Dry	<0.20	<0.20	<0.20	<0.20	<0.20
		11-18-15	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		07-22-16	<0.20	<0.20	<0.20	Dry	Dry	<0.20	<0.20	<0.20	<0.20	<0.20
		12-08-16	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	0.38	<0.20	0.21	<0.20
		08-03-17	<0.20	Dry	<0.20	Dry	Dry	<0.20	<0.20	<0.20	<0.20	<0.20
		12-18-17	<0.20	<0.20	<0.20	Dry	<0.20	<0.20	0.54	<0.20	0.30	0.33
		07-25-18	Dry	<0.20	<0.20	<0.20	Dry	<0.20	<0.20	<0.20	0.41	<0.20
		11-23-18	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.49	<0.20	0.22	0.20
		07-29-19	Dry	<0.20	Insufficient Water to Sample	<0.20	Dry	<0.20	<0.20	<0.20	<0.20	<0.20
		12-13-19	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.75	<0.20	0.36	0.53
		07-21-20	Dry	<0.20	<0.20	Dry	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		12-01-20	<0.20	<0.20	<0.20	No Flow	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.05	12-22-14	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010
		07-27-15	<0.010	<0.010	<0.010	Dry	Dry	<0.010	<0.010	<0.010	<0.010	<0.010
		11-18-15	<0.010	**0.068**	<0.010	<0.010	<0.010	**0.39**	0.015	<0.010	<0.010	<0.010
		07-22-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	<0.010	<0.010
		12-08-16	<0.010	0.011	<0.010	<0.010	<0.010	0.028	0.027	<0.010	<0.010	<0.010
		08-03-17	<0.010	Dry	<0.010	Dry	Dry	<0.010	<0.010	<0.010	<0.010	<0.010
		12-18-17	<0.010	<0.010	0.016	Dry	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
		07-25-18	Dry	<0.010	0.034	<0.010	Dry	<0.010	<0.010	<0.010	<0.010	<0.010
		11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**1.3**	<0.010	<0.010
		07-29-19	Dry	<0.010	Insufficient Water to Sample	<0.010	Dry	<0.010	<0.010	<0.010	<0.010	<0.010
		12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
		07-21-20	Dry	<0.010	<0.010	Dry	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
		12-01-20	<0.010	<0.010	<0.010	No Flow	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Notes:

[1] Pre-Construction/Baseline Calculated 95% UCL are from the EEMSWCM Program

[2] Added to the program in July 2015

Bold indicates the concentration exceeds the Pre-Construction/Baseline Calculated 95% UCL

- The strontium concentrations ranging from 150 µg/L to 220 µg/L in SRC-1-SW, COB-B-SW, COB-4-SW and COB-6-SW exceeded the Upstream Calculated 95% UCL of 132 ug/L. The strontium concentration of 220 µg/L in COB-B-SW also exceeded the Pre-Construction/Baseline Calculated 95% UCL of 210 ug/L.
- The sulphate concentrations ranging from 27 µg/L to 150 µg/L in CB-SW, NRC-1-SW, SRC-1-SW, COB-B-SW, COB-4-SW and COB-6-SW exceeded the Upstream Calculated 95% UCL of 26 ug/L. The sulphate concentration of 150 µg/L in COB-B-SW exceeded the Pre-Construction/Baseline Calculated 95% UCL of 84 ug/L.
- The zinc concentration of 7.1 ug/L exceeded the CCME FWAL guideline of 7 ug/L in WB-1-SW (noting that the concentration in the field duplicate sample was <5.0 ug/L and did not exceed the CCME FWAL guideline).
- The laboratory detection limits for chromium, cobalt, copper, iron, lead, nickel, selenium and zinc were elevated above one or more comparison criteria for the Narrows and BP-1-SW.

Table 5 provides a summary of concentrations reported for select inorganic parameters relative to the calculated 95% UCLs. Inorganic parameter exceedances of the Upstream Calculated 95% UCLs occurred in CB-SW (sulphate), NRC-1-SW (sulphate), SRC-1-SW (sulphate and strontium), COB-B-SW (sulphate and strontium), COB-4-SW (sulphate and strontium) and COB-6-SW (sulphate and strontium). Inorganic parameter exceedances of the Pre-Construction/ Baseline Calculated 95% UCL occurred in COB-B-SW (sulphate and strontium).There were no exceedances of the relative Battery Point/Narrows Calculated 95% UCL during the fall 2020 monitoring event; however, as noted above, the laboratory detection limits for cobalt and iron in the Narrows and BP-1-SW were elevated above the comparison criteria.

Trend Analysis

The surface water quality trend analysis for the fall 2020 monitoring event was based on the available analytical results (i.e., four rounds of sampling events are required) for select parameters, including:

- PAH indicator parameters anthracene, pyrene, and benzo(a)pyrene; and
- Inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate, and zinc.

Trend analysis results for these select parameters were generally stable or indicated fluctuations with no trend. Sulphate at CB-SW indicated an increasing trend. Strontium at CB-SW, and anthracene, pyrene and cadmium at NRC-1-SW indicated declining trends.

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs												
Sample Location	**Date**	**SO4**	**Al**	**As**	**Cd**	**Cr**	**Co**	**Fe**	**Pb**	**Mn**	**Se**	**Sr**
	Units	**(mg/L)**	**(ug/L)**									
Upstream Calculated 95% UCL[1]		**26**	**220**	**1.6**	**0.1**	**8.3**	**-**	**3,318**	**1.2**	**583**	**1.9**	**132**
Pre-Construction/Baseline Calculated 95% UCL[1]		**84**	**-**	**1.98**	**-**	**-**	**1.3**	**1,900**	**-**	**800**	**-**	**210**
CB-SW	12-22-14	26	110	<1.0	0.018	<1.0	<0.40	290	<0.50	190	<1.0	130
	07-27-15	16	28	<1.0	<0.010	<1.0	<0.40	260	<0.50	61	<1.0	**320**
	11-18-15	24	130	<1.0	0.011	<1.0	<0.40	280	<0.50	140	<1.0	**140**
	07-22-16	10	55	1.4	<0.010	<1.0	<0.40	640	<0.50	71	<1.0	**160**
	12-08-16	23	84	<1.0	0.017	<1.0	<0.40	330	<0.50	310	<1.0	110
	08-03-17	12	150	1.4	<0.010	1.0	<0.40	750	0.61	380	<1.0	**340**
	12-18-17	24	91	<1.0	0.015	<1.0	<0.40	300	<0.50	200	<1.0	130
	07-25-18						Dry					
	11-23-18	**32**	91	<1.0	0.014	<1.0	<0.40	210	<0.50	210	<1.0	77
	07-29-19						Dry					
	12-13-19	**35**	**430**	<1.0	0.026	1.3	0.52	830	**2**	270	<0.50	78
	07-21-20						Dry - No Sample					
	12-01-20	**28**	45	<1.0	0.011	<1.0	<0.40	160	<0.50	83	<0.50	99
NRC-1-SW	12-22-14	20	58	<1.0	0.022	<1.0	<0.40	150	<0.50	85	<1.0	32
	07-27-15	22	45	<1.0	0.019	<1.0	<0.40	1,300	<0.50	75	<1.0	54
	11-18-15	15	**1,500**	**3.5**	**0.14**	1.9	1.5	**3,800**	**9.5**	**1,100**	<1.0	36
	07-22-16	15	31	<1.0	0.016	<1.0	<0.40	970	0.61	47	<1.0	52
	12-08-16	16	110	<1.0	0.025	<1.0	<0.40	360	0.8	200	<1.0	34
	08-03-17						Dry					
	12-18-17	21	34	<1.0	0.016	<1.0	<0.40	140	<0.50	87	<1.0	31
	07-25-18	12	**270**	<1.0	0.012	<1.0	<0.40	460	0.99	62	<1.0	60
	11-23-18	17	36	<1.0	0.015	<1.0	<0.40	130	<0.50	61	<1.0	35
	07-29-19	15	46	<1.0	0.018	<1.0	<0.40	1400	<0.50	130	<1.0	55
	12-13-19	18	92	<1.0	0.020	<1.0	<0.40	270	<0.50	150	<0.50	34
	07-21-20	11	99	<1.0	0.011	<1.0	<0.40	160	2.7	26	<0.50	60
	12-01-20	**27**	14	<1.0	0.011	<1.0	<0.40	62	<0.50	37	<0.50	47
SRC-1-SW	12-22-14	**54**	**290**	<1.0	0.035	<1.0	<0.40	340	1.2	190	<1.0	**150**
	07-27-15	**47**	51	1.0	0.013	<1.0	<0.40	210	1.1	260	<1.0	**150**
	11-18-15	**43**	**240**	<1.0	0.023	1.2	<0.40	310	0.75	230	<1.0	**150**
	07-22-16	**51**	50	**1.9**	0.018	<1.0	<0.40	350	<0.50	350	<1.0	**170**
	12-08-16	**42**	**300**	<1.0	0.039	1.0	<0.40	400	**1.6**	200	<1.0	**140**
	08-03-17	**54**	24	**1.8**	<0.010	<1.0	<0.40	150	<0.50	91	<1.0	**190**
	12-18-17	**50**	**3,000**	**4.1**	**0.31**	4.9	1.7	**4,600**	**10**	**2,200**	<1.0	**140**
	07-25-18	**43**	**2,500**	**4.9**	**0.26**	4.0	1.9	**5,500**	**12**	**2,600**	<1.0	**170**
	11-23-18	**46**	**320**	<1.0	0.027	<1.0	<0.40	420	**1.3**	160	<1.0	130
	07-29-19						Insufficient Water Present - No Sample					
	12-13-19	**47**	**460**	1.2	0.034	1.4	<0.40	770	**1.6**	150	<0.50	130
	07-21-20	**98**	96	**1.8**	0.019	<1.0	<0.40	350	<0.50	280	<0.50	200
	12-01-20	**43**	190	<1.0	0.017	<1.0	<0.40	280	0.72	190	<0.50	**150**
COB-A-SW	12-22-14	**160**	16	<1.0	<0.010	<1.0	<0.40	51	<0.50	25	<1.0	**260**
	07-27-15						Dry					
	11-18-15	**170**	5.1	<1.0	<0.010	<1.0	<0.40	82	<0.50	74	<1.0	**260**
	07-22-16						Dry					
	12-08-16	**150**	8.5	<1.0	<0.010	<1.0	<0.40	68	<0.50	92	<1.0	**250**
	08-03-17						Dry					
	12-18-17						Dry					
	07-25-18	**100**	**300**	**2.6**	0.058	<1.0	1.6	**9,100**	**1.4**	**2,900**	<1.0	**270**
	11-23-18	**110**	46	<1.0	<0.010	<1.0	<0.40	810	<0.50	300	<1.0	**210**
	07-29-19	**100**	10	<1.0	<0.010	<1.0	<0.40	240	<0.50	290	<1.0	**240**
	12-13-19	**120**	7.5	<1.0	<0.010	<1.0	<0.40	<50	<0.50	35	<0.50	**220**
	07-21-20						Dry - No Sample					
	12-01-20						Standing Water/No Flow - No Sample					
COB-B-SW[2]	12-22-14						Dry					
	11-18-15	**190**	7.9	<1.0	<0.010	<1.0	<0.40	<50	<0.50	21	<1.0	**250**
	07-22-16						Dry					
	12-08-16	**440**	13	<1.0	0.027	<1.0	0.90	130	<0.50	**1,400**	<1.0	**480**
	08-03-17						Dry					
	12-18-17	**120**	6.7	<1.0	<0.010	<1.0	0.42	110	<0.50	490	<1.0	**190**
	07-25-18						Dry					
	11-23-18	**110**	7.0	<1.0	<0.010	<1.0	0.46	200	<0.50	500	<1.0	**200**
	07-29-19						Dry					
	12-13-19	**120**	6.1	<1.0	<0.010	<1.0	<0.40	78	<0.50	190	<0.50	**200**
	07-21-20	**140**	6	<1.0	<0.010	<1.0	<0.40	85	<0.50	210	<0.50	**240**
	12-01-20	**150**	6.4	<1.0	<0.010	<1.0	<0.40	96	<0.50	210	<0.50	**220**

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs

Sample Location	Date	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
	Units	(mg/L)	(ug/L)									
Upstream Calculated 95% UCL[1]		**26**	**220**	**1.6**	**0.1**	**8.3**	**-**	**3,318**	**1.2**	**583**	**1.9**	**132**
Pre-Construction/Baseline Calculated 95% UCL[1]		**84**	**-**	**1.98**	**-**	**-**	**1.3**	**1,900**	**-**	**800**	**-**	**210**
COB-4-SW	12-22-14	**47**	82	<1.0	0.014	<1.0	<0.40	210	<0.50	95	<1.0	**140**
	07-27-15	**100**	51	<1.0	<0.010	<1.0	<0.40	460	<0.50	110	<1.0	**250**
	11-18-15	**41**	**7,100**	**13**	**0.29**	8.0	4.6	**14,000**	**37**	**1,500**	<1.0	**150**
	07-22-16	**74**	28	<1.0	<0.010	<1.0	<0.40	300	<0.50	140	<1.0	**270**
	12-08-16	**39**	120	<1.0	0.014	<1.0	<0.40	390	0.99	180	<1.0	110
	08-03-17	**110**	14	<1.0	0.011	<1.0	<0.40	83	<0.50	130	<1.0	**450**
	12-18-17	**42**	53	<1.0	0.010	<1.0	<0.40	270	<0.50	120	<1.0	110
	07-25-18	**100**	43	1.0	<0.010	<1.0	<0.40	51	0.75	23	<1.0	**430**
	11-23-18	**41**	140	<1.0	0.014	<1.0	<0.40	230	0.55	99	<1.0	130
	07-29-19	**69**	28	<1.0	<0.010	<1.0	<0.40	370	<0.50	150	<1.0	**230**
	12-13-19	**43**	35	<1.0	0.015	<1.0	<0.40	170	<0.50	130	<0.50	**110**
	07-21-20	**99**	20	<1.0	<0.010	<1.0	<0.40	120	<0.50	220	<0.50	**340**
	12-01-20	**57**	41	<1.0	<0.010	<1.0	<0.40	160	<0.50	160	<0.50	**170**
COB-6-SW	12-22-14	**56**	61	<1.0	0.01	<1.0	<0.40	170	<0.50	56	<1.0	**180**
	07-27-15	**91**	39	<1.0	<0.010	<1.0	<0.40	160	<0.50	23	<1.0	**300**
	11-18-15	**44**	220	<1.0	0.018	<1.0	<0.40	490	**1.5**	79	<1.0	**180**
	07-22-16	**64**	46	1.0	<0.010	<1.0	<0.40	180	<0.50	37	<1.0	**300**
	12-08-16	**41**	200	<1.0	0.015	<1.0	<0.40	360	1.0	110	<1.0	**160**
	08-03-17	**110**	42	1.3	0.011	<1.0	<0.40	<50	<0.50	35	<1.0	**500**
	12-18-17	**48**	130	<1.0	0.010	<1.0	<0.40	260	<0.50	73	<1.0	**160**
	07-25-18	**95**	23	<1.0	<0.010	<1.0	<0.40	140	<0.50	110	<1.0	**350**
	11-23-18	**45**	150	<1.0	0.015	<1.0	<0.40	360	0.87	130	<1.0	**140**
	07-29-19	**76**	37	<1.0	<0.010	<1.0	<0.40	130	<0.50	31	<1.0	**300**
	12-13-19	**49**	88	<1.0	0.014	<1.0	<0.40	220	<0.50	88	<0.50	**150**
	07-21-20	**110**	32	<1.0	0.016	<1.0	<0.40	<50	<0.50	32	<0.50	**430**
	12-01-20	**54**	52	<1.0	<0.010	<1.0	<0.40	120	<0.50	56	<0.50	**180**
WB-1-SW	12-22-14	7.9	160	<1.0	0.038	<1.0	<0.40	270	0.71	95	<1.0	53
	07-27-15	10	89	<1.0	0.012	<1.0	<0.40	480	<0.50	41	<1.0	100
	11-18-15	8.3	63	<1.0	<0.010	<1.0	<0.40	200	<0.50	43	<1.0	73
	07-22-16	**410**	87	<1.0	0.035	<1.0	<0.40	590	0.56	160	<1.0	**1300**
	12-08-16	8.4	100	<1.0	0.026	<1.0	<0.40	220	<0.50	100	<1.0	61
	08-03-17	**230**	28	1.0	0.027	<1.0	<0.40	680	<0.50	450	<1.0	**940**
	12-18-17	8.0	110	<1.0	0.022	<1.0	<0.40	190	<0.50	63	<1.0	49
	07-25-18	**71**	120	<1.0	0.024	<1.0	<0.40	330	**1.8**	140	<1.0	**320**
	11-23-18	6.5	**1200**	**4.3**	**0.15**	3.5	1.2	**3700**	**28**	200	<1.0	50
	07-29-19	14	69	<1.0	0.02	<1.0	<0.40	290	<0.50	64	<1.0	120
	12-13-19	6.6	110	<1.0	0.027	<1.0	<0.40	210	<0.50	67	<0.50	39
	07-21-20	**330**	55	<1.0	0.087	<1.0	<0.40	420	<0.50	610	<0.50	**1200**
	12-01-20	7.0	110	<1.0	0.027	<1.0	<0.40	330	<0.50	69	<0.50	57
Battery Point/Narrows Calculated 95% UCL[1]		**2,180**	**-**	**-**	**-**	**-**	**0.9**	**190**	**-**	**70**	**-**	**7,000**
NARROWS	12-22-14	270	110	<1.0	0.027	<1.0	<0.40	***250***	<0.50	63	<1.0	610
	07-27-15	1,500	86	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***100***	<10	5,400
	11-18-15	110	76	<1.0	0.012	<1.0	<0.40	***320***	<0.50	45	<1.0	370
	07-22-16	1,400	51	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***120***	<10	5,400
	12-08-16	270	75	<1.0	0.029	<1.0	<0.40	***250***	<0.50	***110***	<1.0	890
	08-03-17	2,000	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***110***	<10	6,100
	12-18-17	150	110	<1.0	0.018	<1.0	<0.40	***280***	<0.50	***72***	<1.0	450
	07-25-18	1,700	56	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***100***	<10	5,000
	11-23-18	180	86	<1.0	0.021	<1.0	<0.40	***220***	<0.50	52	<1.0	500
	07-29-19	1,700	110	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***120***	<10	5,000
	12-13-19	120	110	<1.0	0.021	<1.0	<0.40	***290***	<0.50	65	<0.50	340
	07-21-20	2,100	66	<10	0.13	<10	*<4.0*	*<500*	<5.0	***120***	<5.0	5,600
	12-01-20	1,700	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	38	<5.0	4,500
BP-1-SW	12-22-14	170	110	<1.0	0.028	<1.0	<0.40	***240***	<0.50	61	<1.0	950
	07-27-15	1,300	140	<10	<0.10	<10	*<4.0*	*<500*	<5.0	59	<10	5,300
	11-18-15	190	140	<1.0	0.014	<1.0	<0.40	***410***	<0.50	57	<1.0	580
	07-22-16	1,600	63	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***71***	<10	5,500
	12-08-16	290	86	<1.0	0.025	<1.0	<0.40	***280***	<0.50	***100***	<1.0	1,000
	08-03-17	2,000	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***110***	<10	6,100
	12-18-17	210	95	<1.0	0.020	<1.0	<0.40	***220***	<0.50	60	<1.0	630
	07-25-18	1,900	58	<10	<0.10	<10	*<4.0*	***1,000***	<5.0	***94***	<10	5,900
	11-23-18	250	86	<1.0	0.024	<1.0	<0.40	***240***	<0.50	50	<1.0	730
	07-29-19	1,700	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	50	<10	5,000
	12-13-19	250	88	<1.0	0.021	<1.0	*<0.40*	***220***	<0.50	51	<0.50	660
	07-21-20	2,100	63	<10	0.110	<10	*<4.0*	*<500*	<5.0	44	<5.0	5,500
	12-01-20	2,100	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	22	<5.0	5,600

Notes:

[1] Upstream, Pre-Construction/Baseline and Battery Point/Narrows Calculated 95% UCLs are from the EEMSWCM Program

[2] Added to the program in July 2015

Bold indicates the concentration exceeds the Upstream Calculated 95% UCL

Underline indicates exceedance of the Pre-Construction/Baseline Calculated 95% UCL

Italics Bold indicates exceedance of the Battery Point/Narrows Calculated 95% UCL

Italics indicates that the laboratory detection limit is greater than the comparison criteria

Parameters in NRC-1-SW (i.e., benzo(a)pyrene), SRC-1-SW (i.e., benzo(a)pyrene), COB-4-SW (i.e., pyrene), WB-1-SW (i.e., benzo(a)pyrene) and the Narrows (anthracene) appear to be statistically fluctuating; however, when studied further, results show concentrations are stable (rather than fluctuating) at/near the detection limits of each parameter.

Mann-Kendall results are presented in Appendix D.

Quality Control Process

The laboratory analytical certificate has been reviewed for quality assurance/quality control purposes. The laboratory completed quality control analysis including duplicates, blanks, spikes, surrogate recoveries and spiked blanks to assess accuracy and precision as well as the potential for bias, contamination and degradation or matrix effects. Review of the laboratory report indicated no concern relative to data quality.

One field duplicate sample was collected at WB-1-SW during the fall 2020 monitoring event. The relative percent difference (RPD) was calculated between the original sample and associated field duplicate results. The RPD was not calculated for those parameters where one or both of the results associated with the original and/or field duplicate sample exhibited concentrations less than five times the laboratory reportable detection limit (RDL). Calculations indicate that the RPDs of the analyzed parameters were within the acceptable RPD range (i.e., 40% for organics and 25% for inorganics) with calculated RPDs ranging from 0% to 18.40%, with the exception of turbidity (129.17% RPD). Although the RPD for turbidity was outside the generally acceptable limits, the turbidity concentration in the original sample was 2.0 NTU and the field duplicate was 5.1 NTU, both of which represent low turbidity not expected to affect data quality. The data quality is considered acceptable and the results representative. There were no holding time exceedances.

Summary

Analytical results of the fall 2020 Surface Water Monitoring Program indicate that concentrations of the analyzed parameters are generally below the applicable criteria and respective 95% UCLs. Criteria and 95% UCL exceedances are summarized in Table 6.

Table 6: Summary of Surface Water Station Criteria and 95% UCL Exceedances Fall 2020

Parameter	Location (Criteria and/or 95% UCL Exceedance)
General Chemistry and Metals	
Aluminum	• CB-SW (Tier I EQS (fresh water)) • NRC-1-SW (Tier I EQS (fresh water)) • SRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-B-SW (Tier I EQS (fresh water)) • COB-4-SW (Tier I EQS (fresh water)) • COB-6-SW (Tier I EQS (fresh water)) • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL) and the field duplicate sample of WB-1-SW (Tier I EQS (fresh water))
Boron	• BP-1-SW (Tier I EQS (marine water)) • Narrows (Tier I EQS (marine water))
Cadmium	• CB-SW (Tier I EQS (fresh water)) • NRC-1-SW (Tier I EQS (fresh water)) • SRC-1-SW (Tier I EQS (fresh water)) • WB-1-SW and the field duplicate sample of WB-1-SW (Tier I EQS (fresh water))
Iron	• WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Strontium	• SRC-1-SW (Upstream Calculated 95% UCL) • COB-B-SW (Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Upstream Calculated 95% UCL) • COB-6-SW (Upstream Calculated 95% UCL)
Sulphate	• CB-SW (Upstream Calculated 95% UCL) • NRC-1-SW (Upstream Calculated 95% UCL) • SRC-1-SW (Upstream Calculated 95% UCL) • COB-B-SW (Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Upstream Calculated 95% UCL) • COB-6-SW (Upstream Calculated 95% UCL)
Zinc	• WB-1-SW (CCME FWAL)

Review of the surface water analytical data from the fall 2020 monitoring event indicates findings are generally consistent with past LTMM events, with the following exception:

- NRC-1-SW: The sulphate exceedance of the Upstream Calculated 95% UCL is the first exceedance observed for this parameter at this location since LTMM commenced.

Recommendations

The next semi-annual surface water monitoring event will be conducted in summer 2021. It is recommended that the summer 2021 sampling program include the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) for RCApMS analysis.

Review of current and historical PAH data, including the selected PAH indicator parameters, indicates that PAH exceedances potentially related to remediation activities, or the site, have not been observed since 2016. Based on this, PAHs no longer represent a potential contaminant of concern in surface water at the site, therefore, we recommend removal of PAH analysis from the LTMM surface water program.

During the next sampling event (i.e., summer 2021), if COB-A-SW is observed to be dry or only have standing water, sampling slightly downstream is recommended if conditions support (i.e., if flow is observed at a slightly downstream location).

Disclaimer

Closing

We trust this information is adequate for your needs. Please, however, contact the undersigned if you have any comments or questions regarding the content of this report.

Yours truly,

DILLON CONSULTING LIMITED

Nadine J. Wambolt, B.Tech., CET
Project Manager, Associate

NJW:jb

Attachments

Our file: 20-2862

Appendix A

Site Photographs

Photo No. 1: View of CB-SW looking southeast.

Photo No. 2: View of CB-SW looking northwest.

Photo No. 3: View of NRC-1-SW looking north.

Photo No. 4: View of NRC-1-SW looking southeast.

Photo No. 5: View of SRC-1-SW looking northwest.

Photo No. 6: View of SRC-1-SW looking east**.**

Photo No. 7: View northeast of COB-A-SW, looking northeast.

Photo No. 8: View of COB-A-SW looking west.

Photo No. 9: View of COB-B-SW looking southwest.

Photo No. 10: View of nearby intermittent groundwater surface seepage location northwest of COB-B-SW. Seepage was observed to be dry during the Fall 2020 sampling event.

Photo No. 11: View of COB-4-SW looking west.

Photo No. 12: View of COB-4-SW looking northeast.

Photo No. 13: View of COB-6-SW looking west.

Photo No. 14: View of COB-6-SW looking northeast.

Photo No. 15: View of WB-1-SW looking northeast.

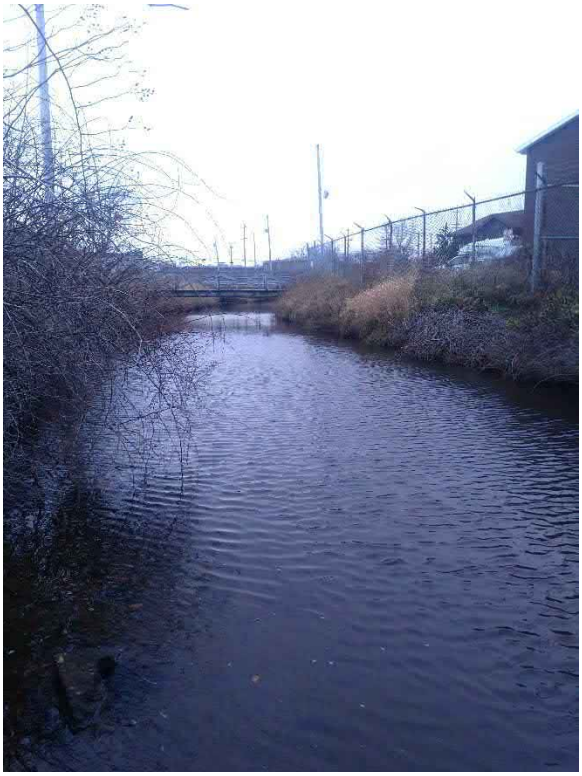

Photo No. 16: View of WB-1-SW looking southwest.

Photo No. 17: View of the Narrows looking northwest.

Photo No. 18: View of the Narrows looking east.

Photo No. 19: View of BP-1-SW looking northwest.

Photo No. 20: View of BP-1-SW looking southeast.

Appendix B

Tables

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	4.6	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	1.4	0.26	0.04	3	0.21	2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
CB-SW	07-23-13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12-22-14	0.049	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.028	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.012
	07-27-15	0.066	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.039	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.016
	11-18-15	0.049	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	0.027	<0.010	<0.050	<0.050	<0.20	<0.010	0.026	0.019
	07-22-16	0.11	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	0.051	<0.010	<0.050	<0.050	<0.20	<0.010	0.05	0.017
	12-8-16	0.056	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.028	<0.010	<0.050	<0.050	<0.20	<0.010	0.028	0.014
	8-3-17	0.071	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.062**	0.048	<0.010	<0.050	<0.050	<0.20	<0.010	0.037	**0.033**
	12-18-17	0.042	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.020	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	0.011
	07-25-18	DRY - NO SAMPLE																			
	11-23-18	0.026	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.050	<0.050	<0.20	<0.010	0.015	<0.010
	07-29-19	DRY - NO SAMPLE																			
	12-13-19	0.029	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.018	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.019
	07-21-20	DRY - NO SAMPLE																			
	12-01-20	0.028	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.017	<0.010	<0.050	<0.050	<0.20	<0.010	0.024	0.014
NRC-1-SW	07-23-13	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.025	0.015	<0.010	<0.20	<0.050	<0.05	<0.010	0.025	0.019
	12-22-14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-27-15	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	11-18-15	0.022	<0.010	**0.037**	**0.075**	**0.068**	0.068	0.039	0.038	0.032	0.091	0.017	**0.18**	0.021	0.041	<0.050	<0.050	<0.20	0.017	0.13	**0.14**
	07-22-16	0.028	<0.010	**0.021**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	<0.010
	12-8-16	0.059	<0.010	0.010	0.011	0.011	0.011	<0.010	<0.010	<0.010	0.016	<0.010	0.03	0.036	<0.010	<0.050	0.056	0.20	<0.010	0.066	**0.027**
	8-3-17	DRY - NO SAMPLE																			
	12-18-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-25-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.01
	11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-29-19	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.020 *	0.016	<0.010
	12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-21-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	4.6	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	1.4	0.26	0.04	3	0.21	2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
SRC-1-SW	07-23-13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12/22/14 [FD]	<0.010	<0.010	<0.010	<0.010	0.013	0.013	0.010	<0.010	<0.010	0.011	<0.010	0.021	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	0.018
	12-22-14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-27-15 [FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-27-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-18-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-22-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.013	0.011
	08-03-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	<0.010	<0.010	<0.010	0.015	**0.016**	0.018	0.012	<0.010	<0.010	0.024	<0.010	0.040	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.021	**0.035**
	7/25/2018 [FD]	<0.010	<0.010	<0.010	0.018	0.013	0.023	0.017	0.014	0.012	0.028	<0.010	**0.052**	<0.010	0.013	<0.050	<0.050	<0.20	<0.010	0.032	**0.048**
	07-25-18	<0.010	<0.010	<0.010	**0.024**	**0.034**	0.036	0.028	0.019	0.022	0.034	<0.010	**0.073**	<0.010	0.018	<0.050	<0.050	<0.20	<0.010	0.047	**0.06**
	11-23-18	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	0.011
	07-29-19	INSUFFICIENT WATER PRESENT - NO SAMPLE																			
	12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.014
	07-21-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
COB-A-SW	07-23-13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12-22-14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.01
	07-27-15	DRY - NO SAMPLE																			
	11-18-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-22-16	DRY - NO SAMPLE																			
	12-8-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	08-03-17	DRY - NO SAMPLE																			
	12-18-17	DRY - NO SAMPLE																			
	07-25-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-29-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.020 *	<0.010	<0.010
	12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-21-20	DRY - NO SAMPLE																			
	12-01-20	STANDING WATER/NO FLOW - NO SAMPLE																			

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	4.6	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	1.4	0.26	0.04	3	0.21	2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
COB-B-SW	07-27-15	DRY - NO SAMPLE																			
	11-18-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-22-16	DRY - NO SAMPLE																			
	12-8-16	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	08-03-17	DRY - NO SAMPLE																			
	12-18-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-25-18	DRY - NO SAMPLE																			
	11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-29-19	DRY - NO SAMPLE																			
	12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-21-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
COB-4-SW	12-22-14	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-27-15	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.010	0.012
	11-18-15	0.14	0.027	**0.12**	**0.43**	**0.39**	0.33	**0.24**	0.20	0.19	0.48	0.073	**0.88**	0.078	**0.22**	<0.050	<0.050	<0.20	0.10	**0.48**	**0.74**
	07-22-16	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16[FD]	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	0.059	<0.010	**0.013**	**0.021**	**0.028**	0.026	0.018	0.017	0.014	0.031	<0.010	**0.043**	0.036	0.013	<0.050	<0.050	<0.20	<0.010	0.065	**0.04**
	08-03-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	8/3/17[FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-25-18	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	<0.010
	07-29-19	0.029	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.010	<0.050	<0.050	<0.20	<0.020 *	0.013	<0.010
	12-13-19	0.031	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	07-21-20	0.037	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.050	<0.050	<0.20	<0.010	0.013	<0.010
	12-01-20	0.025	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.014	<0.010

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	4.6	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	1.4	0.26	0.04	3	0.21	2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
COB-6-SW	07-23-13	0.073	0.025	**0.015**	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.034	0.034	<0.010	<0.20	<0.050	<0.05	<0.010	0.048	**0.026**
	12-22-14	0.089	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.02	0.026	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.013
	07-27-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-18-15	0.016	<0.010	<0.010	0.015	0.015	0.016	0.019	<0.010	<0.010	0.018	<0.010	0.030	<0.010	0.016	<0.050	<0.050	<0.20	<0.010	0.014	**0.030**
	07-22-16	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	0.11	0.012	0.01	0.018	**0.027**	0.025	0.019	0.016	0.013	0.029	<0.010	**0.043**	0.052	0.013	0.083	<0.050	0.38	0.011	0.049	0.038
	08-03-17	0.052	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.036	0.024	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	0.017
	12-18-17	0.13	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.048	<0.010	0.14	0.057	0.54	<0.010	0.030	0.012
	07-25-18	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-23-18	0.15	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.076	<0.010	0.13	0.062	0.49	<0.010	0.043	0.01
	07-29-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.020 *	<0.010	<0.010
	12-13-19	0.19	0.019	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.091	<0.010	0.18	0.083	0.75	<0.010	0.049	0.015
	07-21-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.010	<0.010
WB-1-SW	07-23-13	0.11	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.018	0.054	<0.010	<0.20	<0.050	<0.05	<0.010	0.066	<0.010
	12-22-14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	07-27-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-18-15 [FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-18-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-22-16	0.019	<0.010	<0.010	<0.010	**0.025**	0.029	0.012	0.013	0.017	0.15	<0.010	**0.16**	0.011	0.011	<0.050	<0.050	<0.20	<0.010	0.07	**0.092**
	12-8-16 [FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	08-03-17	0.029	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	**0.044**	0.016	<0.010	<0.050	<0.050	<0.20	<0.010	0.035	**0.027**
	12-18-17[FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-25-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.023	<0.010
	11-23-18	0.25	0.12	**0.84**	**1.6**	**1.3**	**1.1**	**0.69**	**0.61**	**0.67**	**1.7**	0.20	**3.3**	0.33	**0.64**	0.059	0.063	<0.20	0.31	**2.3**	**2.5**
	11-23-18 [FD]	0.22	0.11	**0.97**	**1.6**	**1.1**	**0.99**	**0.60**	**0.56**	**0.59**	**1.7**	0.17	**3.1**	0.30	**0.58**	<0.050	0.057	<0.20	0.27	**2.1**	**2.5**
	07-29-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.020 *	<0.010	<0.010
	07-29-19 [FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	<0.010
	12-13-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-13-19[FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-21-20	0.017	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	0.012
	12-01-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20 [FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Marine Water [1]		6	6	-	-	0.01	-	-	-	-	0.1	-	11	12	-	1	2	1.4	-	4.6	0.02
CCME MAL [2]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BP-1-SW	07-23-13	0.02	<0.03	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.012	0.025	<0.010	<0.20	<0.050	<0.05	<0.03	0.034	0.01
	12-22-14	0.069	0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.041	0.083	<0.010	0.094	<0.050	<0.20	<0.010	0.065	0.036
	07-27-15	0.014	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.015	<0.010
	11-18-15	0.052	0.067	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	0.058	<0.010	0.057	<0.050	<0.20	<0.010	0.042	0.022
	07-22-16	0.014	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	<0.010
	12-8-16	0.059	0.055	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.046	<0.010	0.072	<0.050	<0.20	<0.010	0.03	0.016
	08-03-17	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	0.071	0.071	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.019	0.058	<0.010	0.091	<0.050	0.33	<0.010	0.044	0.018
	07-25-18	0.028	0.033	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.036	<0.010	<0.050	<0.050	<0.20	<0.010	0.028	<0.010
	11-23-18	0.071	0.067	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.022	0.063	<0.010	0.064	<0.050	0.20	<0.010	0.048	0.031
	07-29-19	0.017	<0.020 **	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.016	<0.010	<0.050	<0.050	<0.20	<0.020 *	0.016	<0.010
	12-13-19	0.088	0.08	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.019	0.077	<0.010	0.11	<0.050	0.53	<0.010	0.05	0.025
	07-21-20	0.013	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.015	<0.010
	12-01-20	0.017	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.014	<0.010	<0.050	<0.050	<0.20	<0.010	0.019	<0.010
NARROWS	12-22-14	0.10	0.11	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.033	0.089	<0.010	0.013	<0.050	0.22	<0.51	0.065	0.030
	07-27-15	0.035	0.037	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	0.033	<0.010	<0.050	<0.050	<0.20	<0.010	0.026	0.014
	11-18-15	0.074	0.099	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.023	0.071	<0.010	0.068	<0.050	<0.20	<0.010	0.041	0.019
	07-22-16	0.024	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.021	<0.010	<0.050	<0.050	<0.20	<0.010	0.016	<0.010
	12-8-16	0.078	0.058	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.049	<0.010	0.069	<0.050	0.21	<0.010	0.031	0.016
	08-03-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	0.10	0.099	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.022	0.080	<0.010	0.12	<0.050	0.30	<0.010	0.048	0.018
	07-25-18	0.11	0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.03	0.098	<0.010	0.085	<0.050	0.41	<0.010	0.067	0.013
	11-23-18	0.077	0.069	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.033	0.062	<0.010	0.065	<0.050	0.22	<0.010	0.052	0.035
	07-29-19	0.031	0.023	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010	0.035	0.028	<0.010	<0.050	<0.050	<0.20	<0.020 *	0.029	0.029
	12-13-19	0.090	0.075	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.019	0.074	<0.010	0.097	0.050	0.36	<0.010	0.047	0.019
	07-21-20	0.029	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.029	<0.010	<0.050	<0.050	<0.20	<0.010	0.022	<0.010
	07-21-20 [FD]	0.026	0.023	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.028	<0.010	<0.050	<0.050	<0.20	<0.010	0.021	<0.010
	12-01-20	0.024	0.026	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.020	<0.010	<0.050	<0.050	<0.20	<0.010	0.021	0.012

NOTES:

FD - Field Duplicate

NM - Not Measured or not analyzed

mg/L - milligrams per liter

UCL - Upper Concentration Limit

* Elevated RDL(s) due to detected levels in the method blank

**Elevated PAH RDL(s) due to Matrix/co-extractive interference

- No applicable guideline criteria

1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) 2013.

2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) 2014.

3 - Guideline values for benzo(b)fluoranthene, benzo(j)fluoranthene and benzo(k)fluoranthene are to be compared to the sum of the parameters.

Bold	Concentration exceeds Tier I EQS for surface water (freshwater)
Underline	Concentration exceeds Tier I EQS for surface water (marine)
Shading	Concentration exceeds CCME FWAL
Shading	Concentration exceeds CCME MAL
Double Underline	Concentration exceeds Upstream Calculated 95% Upper Concentration Limit
Dashed Border	Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit
Red	Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit

This summary is to be used in conjunction with, not as a replacement of, the Laboratory Certificates of Analysis.

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
Units		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**TCU**	**mg/L**	**NTU**	**µS/cm**	**pH**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**me/L**	**%**	**unitless**	**unitless**	**unitless**	**unitless**
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	1 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-SW	07-23-13	41100	1710	52000	5620	140	6.5	67	8.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	24	4.4	0.5	500	7.63	150	140	<1.0	270	4.81	0.93	0.08	-0.17	7.55	7.8
	12-22-14	20000	1400	27000	3700	62	26	30	7.3	0.046	110	0.18	<0.010	0.18	0.081	29	4.4	1.1	270	7.74	82	61	<1.0	150	2.65	1.53	-0.418	-0.669	8.16	8.41
	07-27-15	38000	1800	33000	4300	96	16	55	10.0	0.12	210	<0.050	<0.010	<0.050	0.087	9	2.0	1.1	380	7.95	99	95	<1.0	220	3.81	1.60	0.0480	-0.201	7.90	8.15
	11-18-15	27000	1700	28000	3800	72	24	43	7.6	0.048	110	0.12	<0.010	0.12	<0.050	20	5.3	2.1	320	7.81	84	72	<1.0	180	3.17	4.11	-0.271	-0.521	8.08	8.33
	07-22-16	27000	1400	27000	3500	75	10	40	8.6	0.096	140	0.11	0.012	0.12	0.052	65	9.8	1.6	270	7.88	82	75	<1.0	160	2.86	0	-0.188	-0.439	8.07	8.32
	12-8-16	22000	1400	26000	3400	65	23	48	7.1	0.033	<100	0.19	<0.010	0.19	<0.050	30	4.9	1.9	280	7.46	78	65	<1.0	170	3.12	9.86	-0.694	-0.944	8.15	8.4
	8-3-17	33000	2200	30000	3900	97	12	56	10	0.15	330	<0.010	0.06	0.06	0.071	<5.0	1.9	0.88	370	7.99	92	96	<1.0	210	3.76	5.92	0.065	-0.185	7.93	8.18
	12-18-17	22000	1300	26000	3500	66	24	38	7.3	0.038	<100	0.13	<0.01	0.13	<0.050	26	5.7	2.1	280	7.79	80	65	<1.0	160	2.89	5.47	-0.345	-0.595	8.14	8.39
	07-25-18	DRY - NO SAMPLE																												
	11-23-18	68000	1300	29000	3500	58	32	130	6.5	<0.010	<100	0.19	<0.010	0.19	0.059	36	5.8	1.2	550	7.70	88	58	<1.0	300	5.38	6.11	-0.494	-0.743	8.19	8.44
	07-29-19	DRY - NO SAMPLE																												
	12-13-19	24000	1400	31000	3900	66	35	42	7.3	0.011	<100	0.21	<0.010	0.21	0.053	27	4.6	10	310	7.93	94	66	<1.0	190	3.24	3.68	-0.139	-0.389	8.07	8.32
	07-21-20	DRY - NO SAMPLE																												
	12-01-20	25000	1500	29000	3700	62	28	43	5.9	0.024	<100	0.13	0.014	0.14	0.063	27	6.8	1.8	310	7.66	87	62	<1.0	170	3.05	3.21	-0.464	-0.714	8.13	8.38
NRC-1-SW	07-23-13	27800	1560	16600	1370	46	19	27	9.6	0.022	<100	0.092	0.011	0.1	0.098	19	3.9	1.3	220	8.31	47	45	<1.0	131	2.09	2.56	-0.172	-0.423	8.48	8.73
	07/23/13[L]	NM	NM	NM	NM	NM	19	27	9.5	0.028	NM	NM	0.011	0.1	NM	16	NM	NM	220	8.22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	12-22-14	13000	640	12000	1500	17	20	20	5.1	<0.010	<100	0.21	<0.010	0.21	<0.050	10	2.2	0.51	140	7.28	36	17	<1.0	84	1.34	0.37	-1.75	-2.01	9.03	9.28
	07-27-15	20000	480	19000	2100	44	22	29	6.0	<0.010	<100	0.077	<0.010	0.077	0.077	42	5.8	2.4	220	7.47	56	44	<1.0	130	2.16	2.61	-0.963	-1.21	8.43	8.68
	11-18-15	14000	1000	12000	1800	25	15	25	5.7	<0.010	130	0.10	<0.010	0.10	<0.050	15	4.2	21	160	7.37	38	25	<1.0	95	1.51	0.980	-1.49	-1.74	8.86	9.11
	07-22-16	20000	690	18000	2200	49	15	25	5.8	0.012	<100	0.13	<0.010	0.13	<0.050	42	8.1	1.6	200	7.96	55	48	<1.0	120	2	0.25	-0.447	-0.698	8.41	8.66
	12-8-16	15000	680	12000	1600	21	16	26	5.3	<0.010	<100	0.19	<0.010	0.19	0.1	11	2.2	2.3	160	7.21	36	21	<1.0	90	1.49	3.47	-1.74	-1.99	8.95	9.2
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	15000	730	12000	1700	21	21	25	5.7	<0.010	<100	0.21	<0.010	0.21	<0.050	6.7	3.3	0.71	170	7.22	36	21	<1.0	94	1.57	6.44	-1.74	-1.99	8.95	9.2
	07-25-18	25000	770	20000	2400	48	12	39	5.5	<0.010	<100	0.12	<0.010	0.12	<0.050	24	6.4	1.7	260	7.73	59	48	<1.0	140	2.32	0.22	-0.657	-0.907	8.38	8.63
	11-23-18	49000	710	12000	1700	21	17	87	5.0	<0.010	<100	0.14	<0.010	0.14	<0.050	12	2.7	0.89	350	6.98	38	21	<1.0	190	3.24	5.37	-1.99	-2.24	8.97	9.22
	07-29-19	24000	630	19000	2400	52	15	34	6.6	<0.010	<100	<0.010	0.077	0.077	<0.050	49	6.2	2.7	220	7.86	57	52	<1.0	130	2.32	1.98	-0.508	-0.759	8.37	8.62
	12-13-19	17000	680	13000	1700	26	18	29	5.5	<0.010	<100	0.17	<0.010	0.17	<0.050	11	2.4	0.87	160	7.11	38	26	<1.0	100	1.71	5.88	-1.71	-1.96	8.82	9.07
	07-21-20	17000	680	18000	1600	44	11	30	4.9	<0.010	<100	<0.050	<0.010	<0.050	0.05	13	4.8	1.3	200	7.67	52	44	<1.0	110	1.95	4	-0.775	-1.03	8.44	8.70
	12-01-20	20000	760	16000	2200	24	27	37	4.8	<0.010	<100	0.11	<0.010	0.11	<0.050	5.6	2.1	0.27	220	7.42	49	24	<1.0	120	2.08	5.32	-1.35	-1.60	8.77	9.02
SRC-1-SW	07-23-13	39700	2290	51700	7230	110	40	59	6.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	14	4.9	0.46	500	8.37	160	110	2.4	272	4.67	3.11	0.7	0.451	7.67	7.92
	12/22/14[FD]	34000	2700	46000	4800	87	53	56	8.3	<0.010	<100	0.24	0.025	0.26	0.20	16	4.6	5.0	450	7.92	130	86	<1.0	260	4.44	2.42	0.108	-0.141	7.81	8.06
	12-22-14	34000	2600	46000	4800	86	54	56	7.6	<0.010	<100	0.23	0.023	0.25	0.21	16	4.8	5.4	440	7.80	140	85	<1.0	260	4.43	1.84	-0.01	-0.259	7.81	8.06
	07/27/15[FD]	40000	1900	42000	4700	95	46	55	6.6	<0.010	<100	0.092	<0.010	0.092	0.084	17	5.0	1.5	430	7.79	120	94	<1.0	250	4.41	1.73	-0.024	-0.273	7.81	8.06
	07-27-15	38000	1800	41000	4300	95	47	57	6.7	<0.010	<100	0.092	<0.010	0.092	0.079	16	5.0	1.6	430	7.66	120	95	<1.0	250	4.49	4.54	-0.157	-0.407	7.82	8.07
	11-18-15	32000	2700	41000	4600	94	43	51	5.7	<0.010	<100	0.076	<0.010	0.076	<0.050	13	5.0	4.4	430	7.87	120	93	<1.0	240	4.22	3.94	0.0500	-0.200	7.82	8.07
	07-22-16	33000	2900	48000	5600	100	51	46	8.9	0.013	<100	0.08	<0.010	0.08	<0.050	22	7.3	1.8	420	7.99	140	100	<1.0	260	4.39	0	0.266	0.016	7.73	7.98
	12-8-16	51000	2300	42000	4500	86	42	110	7.8	0.012	<100	0.15	0.012	0.16	0.17	19	4.3	7.3	520	7.58	120	86	<1.0	310	5.58	7.72	-0.29	-0.539	7.87	8.12
	8-3-17	50000	2800	51000	5400	120	54	85	10	<0.010	<100	0.014	<0.050	0.055	0.073	14	5.7	1.2	580	8.15	150	110	1.5	330	5.83	5.42	0.492	0.243	7.66	7.91
	12-18-17	24000	5200	110000	22000	86	290	25	13	<0.3	<100	0.17	<0.06	0.17	0.2	72	2.6	17	740	7.7	380	85	<1	545	8.39	2.1	0.214	-0.034	7.49	7.73
	07-25-18[FD]	45000	2700	50000	6000	120	43	63	1.8	<0.010	140	0.066	<0.010	0.066	<0.050	19	8.5	250	530	8	150	120	1.1	290	5.06	1.65	0.348	0.099	7.65	7.9
	07-25-18	48000	2700	48000	2600	110	43	69	2.0	<0.010	180	0.085	<0.010	0.085	<0.050	18	11	140	540	8.14	140	110	1.4	290	5.09	0.1	0.447	0.197	7.69	7.94
	11-23-18	50000	2200	40000	4400	91	46	90	7.7	<0.010	<100	0.19	0.011	0.20	0.41	22	5.3	6.8	530	7.71	120	91	<1.0	300	5.32	6.61	-0.152	-0.401	7.86	8.11
	07-29-19	INSUFFICIENT WATER PRESENT - NO SAMPLE																												
	12-13-19	48000	2300	42000	4400	89	47	74	7.6	<0.010	<100	0.19	0.012	0.21	0.24	23	4.9	18	500	7.72	120	88	<1.0	280	4.87	2.10	-0.117	-0.366	7.84	8.09
	07-21-20	65000	4600	74000	8200	120	98	99	7.2	<0.010	<100	0.24	<0.010	0.24	0.06	14	6.2	3	730	7.82	220	120	<1.0	430	7.21	0.62	0.307	0.058	7.52	7.77
	12-01-20	47000	2300	46000	5000	100	43	75	6.9	<0.010	<100	0.10	<0.010	0.10	<0.050	13	5.0	6.1	520	7.90	140	100	<1.0	290	5.03	2.34	0.144	-0.106	7.75	8.00

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
Units		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
NSE Tier 1 EQS Fresh Water [1]		5	20	5.0	1000	5.3	-	1200	0.01	-	10	2	300	1	820	0.026	73	25	1.0	0.1	21000	0.8	-	-	300	6	30
CCME FWAL [2]		100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [6]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	7
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
CB-SW	07-23-13	**28.5**	<1.0	1.4	61.9	<1.0	<2.0	<50	**0.016**	1.3	<0.40	2.0	**454**	<0.50	**3690**	NM	<2.0	<2.0	<1.0	<0.10	196	<0.10	<2.0	<2.0	0.37	<2.0	<5
	12-22-14	**110**	<1.0	<1.0	27	<1.0	<2.0	<50	**0.018**	<1.0	<0.40	<2.0	290	<0.50	190	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.5	0.17	<2.0	6.0
	07-27-15	**28**	<1.0	<1.0	52	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	260	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	320	<0.10	<2.0	<2.0	<0.10	<2.0	9.0
	11-18-15	**130**	<1.0	<1.0	29	<1.0	<2.0	<50	**0.011**	<1.0	<0.40	<2.0	280	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	4.3	0.12	<2.0	6.1
	07-22-16	**55**	<1.0	1.4	30	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	**640**	<0.50	71	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	5.6	<0.10	<2.0	<5.0
	12-8-16	**84**	<1.0	<1.0	25	<1.0	<2.0	<50	**0.017**	<1.0	<0.40	<2.0	**330**	<0.50	310	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.14	<2.0	<5.0
	8-3-17	**150**	<1.0	1.4	87	<1.0	<2.0	<50	<0.010	1.0	<0.40	<2.0	**750**	0.61	380	<0.013	<2.0	<2.0	<1.0	<0.10	340	<0.10	<2.0	2.9	<0.10	2.6	<5.0
	12-18-17	**91**	<1.0	<1.0	28	<1.0	<2.0	<50	**0.015**	<1.0	<0.40	<2.0	**300**	<0.50	200	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	2.4	0.11	<2.0	<5.0
	07-25-18	DRY - NO SAMPLE																									
	11-23-18	**91**	<1.0	<1.0	16	<1.0	<2.0	<50	**0.014**	<1.0	<0.40	<2.0	210	<0.50	210	<0.013	<2.0	<2.0	<1.0	<0.10	77	<0.10	<2.0	2.4	0.19	<2.0	5.5
	07-29-19	DRY - NO SAMPLE																									
	12-13-19	**430**	<1.0	<1.0	15	<1.0	<2.0	<50	**0.026**	1.3	0.52	**2.6**	**830**	**2.0**	270	<0.013	<2.0	<2.0	<0.50	<0.10	78	<0.10	<2.0	11	0.22	2.5	12
	07-21-20	DRY - NO SAMPLE																									
	12-01-20	**45**	<1.0	<1.0	15	<1.0	<2.0	<50	**0.011**	<1.0	<0.40	1.4	160	<0.50	83	<0.013	<2.0	<2.0	<0.50	<0.10	99	<0.10	<2.0	<2.0	0.11	<2.0	6.5
NRC-1-SW	07-23-13	**131**	<1.0	1.4	11.8	<1.0	<2.0	<50	**0.021**	<1.0	<0.40	**3.1**	148	**1.53**	69.1	NM	<2.0	<2.0	<1.0	<0.10	64.7	<0.10	<2.0	2.4	0.21	2.2	5.3
	07/23/13[L]	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	12-22-14	**58**	<1.0	<1.0	12	<1.0	<2.0	<50	**0.022**	<1.0	<0.40	<2.0	150	<0.50	85	<0.013	<2.0	<2.0	<1.0	<0.10	32	<0.10	<2.0	<2.0	<0.10	<2.0	9.1
	07-27-15	**45**	<1.0	<1.0	11	<1.0	<2.0	<50	**0.019**	<1.0	<0.40	<2.0	**1300**	<0.50	75	<0.013	<2.0	<2.0	<1.0	<0.10	54	<0.10	<2.0	<2.0	<0.10	<2.0	11
	11-18-15	**1500**	<1.0	3.5	29	<1.0	<2.0	<50	**0.14**	1.9	1.5	**5**	**3800**	**9.5**	**1100**	<0.013	<2.0	3.3	<1.0	<0.10	36	<0.10	<2.0	34	0.14	3	27
	07-22-16	**31**	<1.0	<1.0	10	<1.0	<2.0	<50	**0.016**	<1.0	<0.40	<2.0	**970**	0.61	47	<0.013	<2.0	<2.0	<1.0	<0.10	52	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-8-16	**110**	<1.0	<1.0	19	<1.0	<2.0	<50	**0.025**	<1.0	<0.40	<2.0	**360**	0.8	200	<0.013	<2.0	<2.0	<1.0	<0.10	34	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	**34**	<1.0	<1.0	11	<1.0	<2.0	<50	**0.016**	<1.0	<0.40	<2.0	140	<0.50	87	<0.013	<2.0	<2.0	<1.0	<0.10	31	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-25-18	**270**	<1.0	<1.0	14	<1.0	<2.0	<50	**0.012**	<1.0	<0.40	**2.5**	**460**	0.99	62	<0.013	<2.0	<2.0	<1.0	<0.10	60	<0.10	<2.0	7.0	0.10	<2.0	<5.0
	11-23-18	**36**	<1.0	<1.0	13	<1.0	<2.0	<50	**0.015**	<1.0	<0.40	<2.0	130	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	35	<0.10	<2.0	<2.0	<0.1	<2.0	6.7
	07-29-19	**46**	<1.0	<1.0	9.7	<1.0	<2.0	<50	**0.018**	<1.0	<0.40	0.77	**1400**	<0.50	130	<0.013	<2.0	<2.0	<1.0	<0.10	55	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-13-19	**92**	<1.0	<1.0	12	<1.0	<2.0	<50	**0.020**	<1.0	<0.40	0.82	270	<0.50	150	<0.013	<2.0	<2.0	<0.50	<0.10	34	<0.10	<2.0	2.1	<0.10	<2.0	5.1
	07-21-20	**99**	<1.0	<1.0	11	<1.0	<2.0	<50	**0.011**	<1.0	<0.40	1.9	160	**2.7**	26	<0.013	<2.0	<2.0	<0.50	<0.10	60	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-01-20	**14**	<1.0	<1.0	13	<1.0	<2.0	<50	**0.011**	<1.0	<0.40	0.54	62	<0.50	37	<0.013	<2.0	<2.0	<0.50	<0.10	47	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
SRC-1-SW	07-23-13	**29**	<1.0	1.2	10.2	<1.0	<2.0	57	<0.01	<1.0	<0.40	<2.0	69	<0.50	41.4	NM	<2.0	<2.0	<1.0	<0.10	174	<0.10	<2.0	<2.0	0.38	<2.0	<5
	12/22/14[FD]	**350**	<1.0	<1.0	17	<1.0	<2.0	110	**0.042**	<1.0	<0.40	**2.8**	**350**	**1.2**	200	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.8	0.40	<2.0	7.0
	12-22-14	**290**	<1.0	<1.0	17	<1.0	<2.0	110	**0.035**	<1.0	<0.40	**2.6**	**340**	**1.2**	190	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.6	0.40	<2.0	6.9
	07/27/15[FD]	**51**	<1.0	1.0	17	<1.0	<2.0	64	**0.015**	1.5	<0.40	<2.0	190	<0.50	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	<2.0	0.32	<2.0	8.4
	07-27-15	**51**	<1.0	1.0	16	<1.0	<2.0	63	**0.013**	<1.0	<0.40	**24**	210	**1.1**	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	2.4	0.29	<2.0	9.5
	11-18-15	**240**	<1.0	<1.0	16	<1.0	<2.0	57	**0.023**	1.2	<0.40	**2.2**	**310**	0.75	230	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	5.3	0.33	<2.0	<5.0
	07-22-16	**50**	<1.0	1.9	11	<1.0	<2.0	91	**0.018**	<1.0	<0.40	<2.0	**350**	<0.50	350	<0.013	<2.0	<2.0	<1.0	<0.10	170	<0.10	<2.0	2.1	0.38	<2.0	<5.0
	12-8-16	**300**	<1.0	<1.0	18	<1.0	<2.0	54	**0.039**	1.0	<0.40	**2.7**	**400**	**1.6**	200	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	13	0.35	<2.0	5.7
	8-3-17	**24**	<1.0	1.8	19	<1.0	<2.0	130	<0.010	<1.0	<0.40	<2.0	150	<0.50	91	<0.013	<2.0	<2.0	<1.0	<0.10	190	<0.10	<2.0	<2.0	0.4	<2.0	<5.0
	12-18-17	**17**	<0.4	<0.6	25	<0.5	<2	<100	0.017	2.8	2.1	<2	**1400**	<1	1500	<0.013	<4	<3	<1	<0.1	350	<0.8	<20	<3	0.31	<2.0	6.2
	07-25-18[FD]	**1600**	<1.0	3.5	45	<1.0	<2.0	120	**0.18**	2.5	1.2	**5.3**	**3400**	**9.5**	**2600**	**0.04**	<2.0	2.1	<1.0	<0.10	180	<0.10	<2.0	34	0.54	4.9	**30**
	07-25-18	**2500**	1.1	4.9	58	<1.0	<2.0	120	**0.26**	4.0	1.9	**7.9**	**5500**	**12**	**2600**	**0.04**	<2.0	3.4	<1.0	<0.10	170	<0.10	<2.0	50	0.56	**7.4**	**47**
	11-23-18	**320**	<1.0	<1.0	16	<1.0	<2.0	74	**0.027**	<1.0	<0.40	**2.7**	**420**	**1.3**	160	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	9.3	0.32	<2.0	6.2
	07-29-19	INSUFFICIENT WATER PRESENT - NO SAMPLE																									
	12-13-19	**460**	<1.0	1.2	19	<1.0	<2.0	74	**0.034**	1.4	<0.40	**2.8**	**770**	**1.6**	150	<0.013	<2.0	<2.0	<0.5	<0.10	130	<0.10	<2.0	13	0.39	<2.0	7.3
	07-21-20	**96**	<1.0	1.8	24	<1.0	<2.0	210	**0.019**	<1.0	<0.40	1.9	**350**	<0.50	280	<0.013	<2.0	<2.0	<0.5	<0.10	200	<0.10	<2.0	2.8	0.47	<2.0	<5.0
	12-01-20	**190**	<1.0	<1.0	16	<1.0	<2.0	<50	**0.017**	<1.0	<0.40	1.9	280	0.72	190	<0.013	<2.0	<2.0	<0.50	<0.10	150	<0.10	<2.0	5.9	0.34	<2.0	<5.0

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
Units		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	1 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB-A-SW	07-23-13	94700	27000	336000	34900	150	740	150	22	<0.010	<100	3.5	<0.010	3.5	<0.05	5.3	4.8	0.1	2000	7.90	980	150	1.1	1,510	22.8	3.51	1	0.756	6.9	7.14
	12-22-14	23000	3300	88000	13000	97	160	37	13	<0.010	<100	0.4	<0.010	0.4	<0.050	5.4	2	0.41	640	7.68	270	96	<1.0	400	6.32	1.94	0.165	-0.084	7.52	7.76
	07-27-15	DRY - NO SAMPLE																												
	11-18-15	24000	3700	88000	13000	120	170	33	12	0.013	<100	0.25	<0.010	0.25	<0.050	<5.0	2.6	0.25	640	7.95	270	120	<1.0	420	6.88	2.38	0.505	0.257	7.44	7.69
	07-22-16	DRY - NO SAMPLE																												
	12-8-16	22000	4000	81000	11000	110	150	47	13	0.015	<100	0.49	0.012	0.51	0.59	6.3	2.8	0.35	640	7.75	250	100	<1.0	400	6.65	4.64	0.235	-0.014	7.52	7.77
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	DRY - NO SAMPLE																												
	07-25-18	27000	1600	80	9300	140	100	37	16	<0.010	0.16	<0.05	<0.010	<0.05	<0.050	8.2	3.3	2.4	600	8.05	240	140	1.5	370	5.99	2.44	0.658	0.409	7.39	7.64
	11-23-18	21000	2300	70000	10,000	110	110	32	13	<0.010	<100	0.24	<0.010	0.24	0.050	6.2	2.3	14	540	7.78	220	110	<1.0	330	5.42	0.840	0.216	-0.033	7.56	7.81
	07-29-19	29000	1700	75000	9,000	140	100	40	15	<0.010	<100	<0.010	<0.050	<0.050	<0.050	9.2	2.6	0.84	550	8.02	220	140	1.4	360	6.09	2.78	0.611	0.363	7.41	7.66
	12-13-19	21000	2100	71000	9700	110	120	33	13	<0.010	<100	0.21	0.011	0.22	<0.050	5.1	2.5	0.21	510	7.95	220	110	<1.0	330	5.58	2.48	0.405	0.156	7.54	7.79
	07-21-20	DRY - NO SAMPLE																												
	12-01-20	DRY - NO SAMPLE																												
COB-B-SW	07-27-15	DRY - NO SAMPLE																												
	11-18-15	25000	3800	89000	13000	110	190	35	11	0.013	<100	0.35	<0.010	0.35	<0.050	<5.0	2.4	<0.10	670	7.86	280	110	<1.0	430	7.13	3.03	0.393	0.144	7.46	7.71
	07-22-16	DRY - NO SAMPLE																												
	12-8-16	68000	20000	200000	21000	170	440	140	17	0.017	<100	0.56	0.017	0.58	8.1	9.7	6.2	0.4	1600	7.4	590	170	<1.0	1,000	16.7	2.77	0.378	0.132	7.02	7.27
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	21000	2400	63000	9800	96	120	34	12	<0.010	<100	0.31	<0.010	0.31	0.06	<5.0	3.4	0.77	510	7.47	200	96	<1.0	320	5.37	4.07	-0.179	-0.428	7.65	7.89
	07-25-18	DRY - NO SAMPLE																												
	11-23-18	21000	2200	65000	9200	95	110	32	11	<0.010	<100	0.30	<0.010	0.30	0.065	6.2	2.2	1.1	520	7.41	200	94	<1.0	310	5.10	1.29	-0.229	-0.478	7.64	7.88
	07-29-19	DRY - NO SAMPLE																												
	12-13-19	21000	2100	69000	9000	98	120	34	11	<0.010	<100	0.29	<0.010	0.29	<0.050	<5.0	2.2	0.32	530	7.56	210	98	<1.0	330	5.44	2.74	-0.04	-0.289	7.60	7.85
	07-21-20	26000	1700	87000	11000	130	140	35	17	<0.010	<100	<0.050	<0.010	<0.050	<0.050	8	2.7	5.1	620	7.48	260	130	<1.0	400	6.51	0.7	0.086	-0.162	7.4	7.65
	12-01-20	28000	3000	78000	11000	110	150	43	11	<0.010	<100	0.25	<0.010	0.25	<0.050	<5.0	2.4	0.42	630	7.77	240	110	<1.0	390	6.44	2.88	0.248	0.000	7.53	7.77
COB-4-SW	12-22-14	20000	1600	34000	3600	53	47	31	7.4	<0.010	<100	0.26	<0.010	0.26	0.057	12	3	1.5	300	7.70	99	52	<1.0	180	2.92	0.17	-0.431	-0.681	8.13	8.38
	07-27-15	37000	2900	60000	6300	94	100	58	8.5	<0.010	<100	0.31	0.013	0.33	<0.050	11	4.1	1.8	530	7.72	180	93	<1.0	330	5.65	4.15	0.036	-0.213	7.68	7.93
	11-18-15	21000	2800	33000	4600	58	41	33	7.5	0.012	390	0.18	<0.010	0.18	<0.050	14	9.3	140	310	7.56	100	58	<1.0	190	2.96	8.50	-0.540	-0.790	8.10	8.35
	07-22-16	34000	2400	55000	5300	98	74	54	9.2	0.015	<100	0.15	<0.010	0.15	<0.050	19	5.2	1.3	460	7.91	160	98	<1.0	300	5.06	3.27	0.223	-0.026	7.69	7.94
	07/22/16 [FD]	36000	2500	55000	5700	99	72	49	9.1	0.016	<100	0.15	<0.010	0.15	<0.050	18	4.8	1.2	460	7.85	160	99	<1.0	290	4.89	0.31	0.169	-0.081	7.68	7.93
	12-8-16	19000	1300	28000	2900	49	39	34	7.4	0.012	<100	0.27	<0.010	0.27	0.083	8.8	2.6	2.7	270	7.76	81	49	<1.0	160	2.79	5.08	-0.477	-0.727	8.24	8.49
	8-3-17	44000	3300	78000	7600	130	110	72	11	<0.010	<100	<0.010	0.12	0.12	0.061	<5.0	2.6	0.46	690	7.98	230	130	1.2	410	6.98	3.41	0.543	0.295	7.44	7.68
	8/3/17 [FD]	46000	3500	81000	7700	140	110	71	11	<0.010	<100	<0.010	0.1	0.1	0.11	<5.0	2.5	0.34	700	8.15	230	130	1.8	410	6.98	1.45	0.73	0.482	7.42	7.67
	12-18-17	20000	1200	28000	3000	45	42	32	7.8	<0.010	<100	0.22	<0.010	0.22	0.07	7.8	2.7	1.30	280	7.72	81	45	<1.0	160	2.71	3.24	-0.560	-0.810	8.28	8.53
	07-25-18	64000	2500	60000	5200	76	100	110	7.9	<0.010	<100	<0.05	<0.010	<0.05	<0.050	12	4.0	0.42	720	8.84	170	71	4.6	400	6.68	3.01	1.02	0.772	7.81	8.06
	07-25-18	64000	2500	60000	5200	76	100	110	7.9	<0.010	<100	<0.05	<0.010	<0.05	<0.050	12	4.0	0.42	720	8.84	170	71	4.6	400	6.68	3.01	1.02	0.772	7.81	8.06
	11-23-18	56000	1800	38000	4200	73	41	97	7.1	<0.010	<100	0.26	<0.010	0.26	0.21	23	5.0	2.0	520	7.85	110	72	<1.0	290	5.07	3.79	-0.130	-0.379	7.98	8.23
	07-29-19	35000	1700	51000	5000	97	69	53	10	<0.010	<100	<0.010	0.11	0.11	0.074	18	4.1	1.4	470	7.80	150	96	<1.0	280	4.88	3.61	0.0810	-0.168	7.72	7.97
	12-13-19	20000	1100	29000	2900	52	43	35	8	<0.010	<100	0.2	<0.010	0.2	0.061	9.8	2.4	1.3	270	7.66	84	52	<1.0	170	2.93	5.97	-0.542	-0.792	8.20	8.45
	07-21-20	42000	2700	76000	7000	110	99	71	11	<0.010	<100	0.17	<0.010	0.17	0.075	9.6	3.6	0.68	640	7.69	220	110	<1.0	380	6.36	0.63	0.185	-0.064	7.5	7.75
	12-01-20	27000	1700	38000	4000	60	57	47	8.2	<0.010	<100	0.18	0.010	0.19	0.072	14	2.3	0.79	380	7.71	110	59	<1.0	220	3.72	3.62	-0.328	-0.578	8.04	8.29

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
	Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
	NSE Tier 1 EQS Fresh Water [1]	5	20	5.0	1000	5.3	-	1200	0.01	-	10	2	300	1	820	0.026	73	25	1.0	0.1	21000	0.8	-	-	300	6	30
	CCME FWAL [2]	100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [6]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	7
	Upstream Calculated 95% UCL	220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
	Pre-Construction/Baseline Calculated 95% UCL	-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
COB-A-SW	07-23-13	**17.2**	<1.0	<1.0	56.2	<1.0	<2.0	415	**0.015**	<1.0	<0.40	<2.0	56	<0.50	27.9	NM	<2.0	<2.0	<1.0	<0.10	671	<0.10	<2.0	<2.0	2.14	<2.0	<5
	12-22-14	**16**	<1.0	<1.0	14	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	51	<0.50	25	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.38	<2.0	<5.0
	07-27-15	DRY - NO SAMPLE																									
	11-18-15	**5.1**	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	82	<0.50	74	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07-22-16	DRY - NO SAMPLE																									
	12-8-16	**8.5**	<1.0	<1.0	12	<1.0	<2.0	85	<0.010	<1.0	<0.40	<2.0	68	<0.50	92	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	DRY - NO SAMPLE																									
	07-25-18	**300**	<1.0	2.6	73	<1.0	<2.0	58	**0.058**	<1.0	1.6	**2.2**	**9100**	**1.4**	**2900**	<0.013	<2.0	3	<1.0	<0.10	270	<0.10	<2.0	4.6	0.5	<2.0	14
	11-23-18	**46**	<1.0	<1.0	16	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	**810**	<0.50	300	<0.013	<2.0	<2.0	<1.0	<0.10	210	<0.10	<2.0	2	0.31	<2.0	<5.0
	07-29-19	**10**	<1.0	<1.0	18	<1.0	<2.0	53	<0.010	<1.0	<0.40	<0.50	240	<0.50	290	<0.013	<2.0	<2.0	<1.0	<0.10	240	<0.10	<2.0	<2.0	0.49	<2.0	<5.0
	12-13-19	**7.5**	<1.0	<1.0	13	<1.0	<2.0	57	<0.010	<1.0	<0.40	<0.50	<50	<0.50	35	<0.013	<2.0	<2.0	<0.5	<0.10	220	<0.10	<2.0	<2.0	0.31	<2.0	<5.0
	07-21-20	DRY - NO SAMPLE																									
	12-01-20	STANDING WATER/NO FLOW - NO SAMPLE																									
COB-B-SW	07-27-15	DRY - NO SAMPLE																									
	11-18-15	**7.9**	<1.0	<1.0	18	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	<50	<0.50	21	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07-22-16	DRY - NO SAMPLE																									
	12-8-16	**13**	<1.0	<1.0	52	<1.0	<2.0	540	**0.027**	<1.0	0.90	<2.0	130	<0.50	**1400**	<0.013	<2.0	2.8	<1.0	<0.10	480	<0.10	<2.0	<2.0	0.68	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	**6.7**	<1.0	<1.0	14	<1.0	<2.0	<50	<0.010	<1.0	0.42	<2.0	110	<0.50	490	<0.013	<2.0	<2.0	<1.0	<0.10	190	<0.10	<2.0	<2.0	0.18	<2.0	<5.0
	07-25-18	DRY - NO SAMPLE																									
	11-23-18	**7.0**	<1.0	<1.0	17	<1.0	<2.0	<50	<0.010	<1.0	0.46	<2.0	200	<0.50	500	<0.013	<2.0	<2.0	<1.0	<0.1	200	<0.10	<2.0	<2.0	0.27	<2.0	<5.0
	07-29-19	DRY - NO SAMPLE																									
	12-13-19	**6.1**	<1.0	<1.0	16	<1.0	<2.0	67	<0.010	<1.0	<0.40	<0.50	78	<0.50	190	<0.013	<2.0	<2.0	<0.5	<0.10	200	<0.10	<2.0	<2.0	0.29	<2.0	<5.0
	07-21-20	**6.0**	<1.0	<1.0	14	<1.0	<2.0	66	<0.010	<1.0	<0.40	<0.50	85	<0.50	210	<0.013	<2.0	<2.0	<0.5	<0.10	240	<0.10	<2.0	<2.0	0.45	<2.0	<5.0
	12-01-20	**6.4**	<1.0	<1.0	12	<1.0	<2.0	52	<0.010	<1.0	<0.40	<0.50	96	<0.50	210	<0.013	<2.0	<2.0	<0.50	<0.10	220	<0.10	<2.0	<2.0	0.36	<2.0	<5.0
COB-4-SW	12-22-14	**82**	<1.0	<1.0	20	<1.0	<2.0	<50	**0.014**	<1.0	<0.40	<2.0	210	<0.50	95	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	3.2	0.18	<2.0	7.2
	07-27-15	**51**	<1.0	<1.0	32	<1.0	<2.0	60	<0.010	<1.0	<0.40	<2.0	**460**	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	2.1	0.35	<2.0	10
	11-18-15	**7100**	<1.0	**13**	77	<1.0	<2.0	<50	**0.29**	8.0	4.6	**17**	**14000**	**37**	**1500**	**0.082**	<2.0	9.5	<1.0	<0.10	150	0.18	<2.0	200	0.53	**14**	**96**
	07-22-16	**28**	<1.0	<1.0	24	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	300	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	270	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
	07/22/16 [FD]	**42**	<1.0	<1.0	26	<1.0	<2.0	<50	<0.010	<1.0	<0.40	2	**310**	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	280	<0.10	<2.0	<2.0	0.33	<2.0	<5.0
	12-8-16	**120**	<1.0	<1.0	19	<1.0	<2.0	<50	**0.014**	<1.0	<0.40	<2.0	**390**	0.99	180	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.18	<2.0	<5.0
	8-3-17	**13**	<1.0	<1.0	36	<1.0	<2.0	58	**0.011**	<1.0	<0.40	<2.0	83	<0.50	120	<0.013	<2.0	<2.0	<1.0	<0.10	440	<0.10	<2.0	<2.0	0.5	<2.0	<5.0
	8/3/17 [FD]	**14**	<1.0	<1.0	37	<1.0	<2.0	63	<0.010	<1.0	<0.40	<2.0	83	<0.50	130	<0.013	<2.0	<2.0	<1.0	<0.10	450	<0.10	<2.0	<2.0	0.54	<2.0	<5.0
	12-18-17	**53**	<1.0	<1.0	18	<1.0	<2.0	<50	0.010	<1.0	<0.40	<2.0	270	<0.50	120	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.16	<2.0	5.1
	07-25-18	**43**	<1.0	1.0	33	<1.0	<2.0	57	<0.010	<1.0	<0.40	<2.0	51	0.75	23	<0.013	<2.0	<2.0	<1.0	<0.10	430	<0.10	<2.0	<2.0	0.48	<2.0	<5.0
	07-25-18	**43**	<1.0	1.0	33	<1.0	<2.0	57	<0.010	<1.0	<0.40	<2.0	51	0.75	23	<0.013	<2.0	<2.0	<1.0	<0.10	430	<0.10	<2.0	<2.0	0.48	<2.0	<5.0
	11-23-18	**140**	<1.0	<1.0	17	<1.0	<2.0	<50	**0.014**	<1.0	<0.40	2.0	230	0.55	99	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.6	0.27	<2.0	<5.0
	07-29-19	**28**	<1.0	<1.0	26	<1.0	<2.0	<50	<0.010	<1.0	<0.40	1.2	**370**	<0.50	150	<0.013	<2.0	<2.0	<1.0	<0.10	230	<0.10	<2.0	<2.0	0.35	<2.0	<5.0
	12-13-19	**35**	<1.0	<1.0	18	<1.0	<2.0	<50	**0.015**	<1.0	<0.40	0.70	170	<0.50	130	<0.013	<2.0	<2.0	<0.5	<0.10	110	<0.10	<2.0	<2.0	0.21	<2.0	<5.0
	07-21-20	**20**	<1.0	<1.0	33	<1.0	<2.0	54	<0.010	<1.0	<0.40	1.3	120	<0.50	220	<0.013	<2.0	<2.0	<0.5	<0.10	340	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	12-01-20	**41**	<1.0	<1.0	24	<1.0	<2.0	<50	<0.010	<1.0	<0.40	0.75	160	<0.50	160	<0.013	<2.0	<2.0	<0.5	<0.10	170	<0.10	<2.0	<2.0	0.17	<2.0	<5.0

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat. pH (@20C)	Sat. pH (@4C)
Units		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	1 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB-6-SW	07-23-13	69200	5110	98900	9820	81	170	110	11	<0.010	<100	0.35	<0.010	0.35	<0.05	7.2	2.4	0.38	890	8.36	290	79	1.7	520	8.18	4.1	0.78	0.532	7.58	7.83
	12-22-14	22000	1800	39000	3800	58	56	35	8.3	<0.010	<100	0.28	0.011	0.29	0.1	11	2.6	0.87	340	7.86	110	57	<1.0	200	3.33	0.76	-0.173	-0.423	8.04	8.29
	07-27-15	39000	2600	57000	5000	93	91	61	8.4	<0.010	<100	0.18	0.015	0.19	<0.050	10	3.7	0.98	520	8.46	160	91	2.5	320	5.5	4.46	0.75	0.501	7.71	7.96
	11-18-15	27000	2100	37000	3700	70	44	42	7.6	0.012	<100	0.16	<0.010	0.16	<0.050	10	3.7	4.9	360	7.96	110	69	<1.0	210	3.51	1.89	-0.023	-0.273	7.98	8.23
	07-22-16	40000	2400	55000	4700	99	64	67	8.2	0.015	<100	0.081	<0.010	0.081	<0.050	23	5.3	1	490	8.05	160	98	1.0	300	5.21	2.46	0.365	0.116	7.69	7.94
	12-8-16	26000	1700	34000	3400	60	41	53	7.9	0.014	<100	0.27	0.01	0.28	<0.050	12	2.9	3.4	340	7.87	100	60	<1.0	210	3.56	5.33	-0.203	-0.453	8.08	8.33
	8-3-17	74000	3300	61000	5300	72	110	130	9.9	<0.010	<100	<0.010	0.082	0.082	0.093	6.3	3.1	0.29	760	8.83	170	67	4.3	430	7.29	3.7	0.989	0.74	7.84	8.09
	12-18-17	26000	1600	34000	3400	60	48	44	8.4	<0.010	<100	0.26	<0.010	0.26	0.05	13	3.5	2.7	350	7.6	99	60	<1.0	200	3.46	4.22	-0.473	-0.723	8.08	8.33
	07-25-18	43000	2800	72000	6600	130	95	67	9.7	<0.010	<100	0.14	<0.010	0.14	<0.050	12	4.1	0.6	640	7.99	210	120	1.1	370	6.41	2.56	0.499	0.25	7.49	7.74
	11-23-18	44000	1500	33000	3400	56	45	76	7.6	<0.010	<100	0.20	<0.010	0.20	0.084	15	3.5	1.8	440	7.95	96	55	<1.0	240	4.19	3.71	-0.191	-0.440	8.14	8.39
	07-29-19	44000	2100	56000	4300	100	76	72	8.9	<0.010	<100	<0.010	0.064	0.06	<0.050	16	4.1	1.0	530	8.68	160	96	4.3	320	5.63	4.65	0.986	0.737	7.70	7.95
	12-13-19	29000	1600	36000	3400	68	49	54	8.3	<0.010	<100	0.24	0.013	0.25	0.058	13	3.2	2.8	370	7.78	100	67	<1.0	220	3.91	6.68	-0.228	-0.478	8.01	8.26
	07-21-20	60000	2900	77000	6300	120	110	96	8.1	<0.010	<100	0.056	<0.010	0.056	<0.050	12	3.7	0.52	750	8.28	220	120	2.1	440	7.42	2.42	0.78	0.531	7.5	7.75
	12-01-20	33000	1800	41000	4100	72	54	56	7.4	<0.010	<100	0.15	0.010	0.16	<0.050	9.8	<5.0**	2.3	430	7.88	120	71	<1.0	240	4.15	3.49	-0.0550	-0.305	7.94	8.19
WB-1-SW	07-23-13	5750000	210000	323000	667000	83	1500	11000	2	<0.010	<1000	0.051	<0.010	0.051	0.2	9.6	<5	6	31000	7.65	3600	82	<1.0	19,000	330	0.43	0.178	-0.059	7.47	7.71
	12-22-14	12000	700	7500	1400	17	7.9	21	3.4	0.011	<100	0.14	<0.010	0.14	0.12	32	3.7	0.83	120	7.19	25	17	<1.0	65	1.1	2.33	-2.04	-2.29	9.23	9.48
	07-27-15	19000	860	12000	2200	28	10	32	3.6	0.023	<100	0.16	0.016	0.18	0.18	51	6.3	0.82	170	7.44	39	28	<1.0	98	1.68	0.00	-1.37	-1.62	8.82	9.07
	11/18/15 [FD]	14000	760	9200	1600	23	8.3	26	3.9	0.012	<100	0.098	<0.010	0.098	<0.050	30	4.5	0.18	140	7.42	29	23	<1.0	77	1.36	6.25	-1.59	-1.84	9.01	9.26
	11-18-15	14000	760	9600	1600	23	8.3	24	3.9	0.012	<100	0.11	<0.010	0.11	<0.050	30	4.3	0.67	140	7.45	31	23	<1.0	77	1.32	3.13	-1.54	-1.79	8.99	9.24
	07-22-16	1600000	54000	79000	190000	62	410	2900	4.2	0.024	<100	0.22	0.021	0.24	0.084	37	16	2.2	8500	7.52	980	62	<1.0	5,300	92.8	2.21	-0.583	-0.823	8.11	8.35
	12/8/16 [FD]	14000	770	9400	1700	22	8.5	24	3.7	0.03	<100	0.15	<0.010	0.15	0.13	26	3.7	1.1	140	7.29	30	22	<1.0	76	1.3	1.56	-1.71	-1.97	9.01	9.26
	12-8-16	14000	800	9700	1600	22	8.4	25	3.8	0.03	<100	0.15	<0.010	0.15	0.14	27	3.6	1.2	140	7.46	31	22	<1.0	77	1.33	3.1	-1.54	-1.79	9	9.25
	8-3-17	940000	35000	82000	110000	97	230	1600	5.2	<0.010	<100	<0.010	0.055	0.055	0.075	9	2.6	1.8	5900	7.73	660	96	<1.0	3,100	52	2.7	-0.088	-0.33	7.81	8.06
	12-18-17 [FD]	11000	610	7400	1400	19	8.3	21	3.4	<0.010	<100	0.11	<0.010	0.11	<0.050	32	4.9	0.78	120	7.18	24	19	<1.0	66	1.16	7.91	-1.99	-2.24	9.17	9.42
	12-18-17	11000	590	7600	1400	19	8.0	21	3.4	<0.010	<100	0.11	<0.010	0.11	<0.050	30	4.8	0.75	110	7.28	25	19	<1.0	65	1.13	6.10	-1.88	-2.14	9.17	9.42
	07-25-18	220000	8500	33000	26000	63	71	460	4.0	<0.010	<100	0.16	0.013	0.17	0.051	21	4.3	1.3	1800	7.96	190	63	<1.0	870	15.8	7.17	-0.25	-0.497	8.21	8.46
	11-23-18	15000	820	7700	1600	17	6.5	26	3.0	<0.010	160	0.091	<0.010	0.091	<0.050	38	6.3	83	130	7.63	26	17	<1.0	75	1.21	4.35	-1.58	-1.83	9.21	9.47
	11-23-18 [FD]	15000	780	8000	1500	16	6.5	26	3.0	<0.010	<100	0.12	<0.010	0.12	0.41	39	6.2	50	130	7.29	26	16	<1.0	75	1.20	6.25	-1.93	-2.18	9.22	9.47
	07-29-19	33000	1500	16000	3900	35	14	67	4.0	<0.010	<100	<0.010	0.091	0.091	<0.050	43	5.3	0.79	300	7.55	55	35	<1.0	160	2.89	5.28	-1.09	-1.34	8.64	8.89
	07-29-19 [FD]	39000	1500	16000	4800	36	16	77	3.9	<0.010	<100	<0.010	0.13	0.13	<0.050	40	5.2	0.91	320	7.54	60	36	<1.0	180	3.23	4.70	-1.08	-1.33	8.62	8.87
	12-13-19	12000	500	6700	1300	16	6.6	23	3.2	<0.010	<100	0.1	<0.010	0.1	<0.050	33	3.9	1.3	110	7.22	22	16	<1.0	64	1.12	6.16	-2.08	-2.33	9.29	9.55
	12-13-19 [FD]	12000	490	6200	1200	16	7.5	24	3.2	<0.010	<100	0.098	<0.010	0.1	<0.050	31	3.9	1.1	110	7.13	21	16	<1.0	65	1.16	10.5	-2.19	-2.44	9.31	9.57
	07-21-20	1200000	47000	90000	150000	60	330	2500	4.3	<0.010	<100	0.086	<0.010	0.086	0.099	15	3.9	2	7700	7.59	860	60	<1.0	4,400	78.2	3.63	-0.451	-0.691	8.04	8.28
	12-01-20	13000	580	8100	1500	16	7.0	26	2.9	<0.010	<100	0.095	<0.010	0.095	<0.050	37	<5.0**	2.0	120	7.22	26	16	<1.0	69	1.20	4.35	-1.99	-2.24	9.21	9.46
	12-01-20 [FD]	13000	580	8000	1500	18	7.5	26	3.2	<0.010	<100	0.098	<0.010	0.098	<0.050	38	5.4	5.1	130	7.29	26	18	<1.0	72	1.26	5.88	-1.89	-2.14	9.17	9.43

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NSE Tier 1 EQS Fresh Water [1]		5	20	5.0	1000	5.3	-	1200	0.01	-	10	2	300	1	820	0.026	73	25	1.0	0.1	21000	0.8	-	-	300	6	30
CCME FWAL [2]		100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [6]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	7
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
COB-6-SW	07-23-13	**65.7**	<1.0	1.0	66.6	<1.0	<2.0	66	<0.01	<1.0	<0.40	<2.0	61	<0.50	30.3	NM	<2.0	<2.0	<1.0	<0.10	645	<0.10	<2.0	<2.0	0.68	<2.0	<5
	12-22-14	**61**	<1.0	<1.0	22	<1.0	<2.0	<50	0.01	<1.0	<0.40	<2.0	170	<0.50	56	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	<2.0	0.22	<2.0	6.0
	07-27-15	**39**	<1.0	<1.0	29	<1.0	<2.0	52	<0.010	<1.0	<0.40	**2.2**	160	<0.50	23	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.34	<2.0	7.4
	11-18-15	**220**	<1.0	<1.0	21	<1.0	<2.0	<50	**0.018**	<1.0	<0.40	<2.0	**490**	**1.5**	79	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	4	0.22	<2.0	<5.0
	07-22-16	**46**	<1.0	1.0	26	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	180	<0.50	37	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.3	<2.0	<5.0
	12-8-16	**200**	<1.0	<1.0	21	<1.0	<2.0	<50	**0.015**	<1.0	<0.40	<2.0	**360**	1.0	110	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	3	0.23	<2.0	<5.0
	8-3-17	**42**	<1.0	1.3	38	<1.0	<2.0	59	**0.011**	<1.0	<0.40	<2.0	<50	<0.50	35	<0.013	<2.0	<2.0	<1.0	<0.10	500	<0.10	<2.0	<2.0	0.43	<2.0	<5.0
	12-18-17	**130**	<1.0	<1.0	20	<1.0	<2.0	<50	0.010	<1.0	<0.40	<2.0	260	<0.50	73	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	3.0	0.19	<2.0	<5.0
	07-25-18	**23**	<1.0	<1.0	35	<1.0	<2.0	62	<0.010	<1.0	<0.40	<2.0	140	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	350	<0.10	<2.0	<2.0	0.5	<2.0	<5.0
	11-23-18	**150**	<1.0	<1.0	20	<1.0	<2.0	<50	**0.015**	<1.0	<0.40	<2.0	**360**	0.87	130	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	4.8	0.22	<2.0	6.4
	07-29-19	**37**	<1.0	<1.0	25	<1.0	<2.0	<50	<0.010	<1.0	<0.40	1.2	130	<0.50	31	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.39	<2.0	<5.0
	12-13-19	**88**	<1.0	<1.0	19	<1.0	<2.0	<50	**0.014**	<1.0	<0.40	1.1	220	<0.50	88	<0.013	<2.0	<2.0	<0.5	<0.10	150	<0.10	<2.0	<2.0	0.24	<2.0	<5.0
	07-21-20	**32**	<1.0	<1.0	32	<1.0	<2.0	81	**0.016**	<1.0	<0.40	1.3	<50	<0.50	32	<0.013	<2.0	<2.0	<0.5	<0.10	430	<0.10	<2.0	<2.0	0.44	<2.0	<5.0
	12-01-20	**52**	<1.0	<1.0	21	<1.0	<2.0	<50	<0.010	<1.0	<0.40	1.1	120	<0.50	56	<0.013	<2.0	<2.0	<0.50	<0.10	180	<0.10	<2.0	<2.0	0.22	<2.0	<5.0
WB-1-SW	07-23-13	*<50*	<10	<10	280	<10	<20	**2470**	**0.6**	*<10*	*<4.0*	*<20*	**936**	*<5*	**1920**	NM	*<20*	*<20*	*<10*	*<1.0*	4660	*<1*	<20	<20	1.6	<20	*<50*
	12-22-14	**180**	<1.0	<1.0	15	<1.0	<2.0	<50	**0.038**	<1.0	<0.40	<2.0	270	0.71	95	<0.013	<2.0	<2.0	<1.0	<0.10	53	<0.10	<2.0	4.6	<0.10	<2.0	10
	07-27-15	**89**	<1.0	<1.0	18	<1.0	<2.0	<50	**0.012**	<1.0	<0.40	<2.0	**480**	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	100	<0.10	<2.0	<2.0	<0.10	<2.0	7.9
	11/18/15 [FD]	**63**	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	70	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	11-18-15	**63**	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	43	<0.013	<2.0	<2.0	<1.0	<0.10	73	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-22-16	**87**	<1.0	<1.0	39	<1.0	<2.0	690	**0.035**	<1.0	<0.40	<2.0	**590**	0.56	160	<0.013	<2.0	<2.0	<1.0	<0.10	1300	<0.10	<2.0	<2.0	0.47	<2.0	11
	12/8/16 [FD]	**140**	<1.0	<1.0	15	<1.0	<2.0	<50	**0.025**	<1.0	<0.40	<2.0	220	<0.50	98	<0.013	<2.0	<2.0	<1.0	<0.10	59	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-8-16	**100**	<1.0	<1.0	16	<1.0	<2.0	<50	**0.026**	<1.0	<0.40	<2.0	220	<0.50	100	<0.013	<2.0	<2.0	<1.0	<0.10	61	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	8-3-17	**28**	<1.0	1.0	73	<1.0	<2.0	430	**0.027**	<1.0	<0.40	<2.0	**680**	<0.50	450	<0.013	<2.0	<2.0	<1.0	<0.10	940	<0.10	<2.0	<2.0	0.43	<2.0	<5.0
	12-18-17 [FD]	**110**	<1.0	<1.0	12	<1.0	<2.0	<50	**0.027**	<1.0	<0.40	<2.0	190	<0.50	62	<0.013	<2.0	<2.0	<1.0	<0.10	48	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-18-17	**110**	<1.0	<1.0	12	<1.0	<2.0	<50	**0.022**	<1.0	<0.40	<2.0	190	<0.50	63	<0.013	<2.0	<2.0	<1.0	<0.10	49	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-25-18	**120**	<1.0	<1.0	35	<1.0	<2.0	110	**0.024**	<1.0	<0.40	**4.7**	**330**	**1.8**	140	<0.013	<2.0	<2.0	<1.0	<0.1	320	<0.10	<2.0	2.7	0.18	<2.0	6.0
	11-23-18	**1800**	<1.0	4.3	37	<1.0	<2.0	<50	0.14	3.5	1.2	**9.7**	3500	**29**	210	**0.037**	<2.0	2.8	<1.0	**1.7**	50	<0.10	<2.0	25	0.17	**6.8**	**79**
	11-23-18 [FD]	**1200**	<1.0	3.9	40	<1.0	<2.0	<50	0.15	3.3	1.2	**9.2**	3700	**28**	200	**0.033**	<2.0	2.3	<1.0	**1.5**	50	<0.10	<2.0	23	0.15	5.2	**160**
	07-29-19	**69**	<1.0	<1.0	20	<1.0	<2.0	<50	**0.020**	<1.0	<0.40	0.94	290	<0.50	64	<0.013	<2.0	<2.0	<1.0	<0.10	120	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-29-19 [FD]	**71**	<1.0	<1.0	21	<1.0	<2.0	<50	**0.021**	<1.0	<0.40	0.89	**310**	<0.50	71	<0.013	<2.0	<2.0	<1.0	<0.10	120	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-13-19	**110**	<1.0	<1.0	12	<1.0	<2.0	<50	**0.027**	<1.0	<0.40	<0.50	210	<0.50	67	<0.013	<2.0	<2.0	<0.5	<0.10	39	<0.10	<2.0	<2.0	<0.10	<2.0	5.0
	12-13-19 [FD]	**110**	<1.0	<1.0	11	<1.0	<2.0	<50	**0.029**	<1.0	<0.40	<0.50	180	<0.50	61	<0.013	<2.0	<2.0	<0.5	<0.10	37	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-21-20	**55**	<1.0	<1.0	95	<1.0	<2.0	550	**0.087**	<1.0	<0.40	1.8	**420**	<0.50	610	<0.013	<2.0	<2.0	<0.5	<0.10	1200	<0.10	<2.0	<2.0	0.39	<2.0	6.9
	12-01-20	**110**	<1.0	<1.0	14	<1.0	<2.0	<50	**0.027**	<1.0	<0.40	0.71	**330**	<0.50	69	<0.013	<2.0	<2.0	<0.50	<0.10	57	<0.10	<2.0	2.4	<0.10	<2.0	7.1
	12-01-20 [FD]	**97**	<1.0	<1.0	14	<1.0	<2.0	<50	**0.013**	<1.0	<0.40	0.65	300	<0.50	65	<0.013	<2.0	<2.0	<0.50	<0.10	58	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
Units		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**TCU**	**mg/L**	**NTU**	**µS/cm**	**pH**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**me/L**	**%**	**unitless**	**unitless**	**unitless**	**unitless**
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	1 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NSE Tier 1 EQS Marine Water [1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME MAL [2]		-	-	-	-	-	-	-	-	-	-	200	-	-	1.5 [3]	-	-	-	-	7.0-8.7	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	2180	-	-	-	-	-	-	-	-	-	-	88	-	-	-	-	-	-	-	-	-	-	-	-
BP-1-SW	11-26-12	2500000	84000	130000	300000	68	650	4400	5.8	0.011	<100	0.17	0.02	0.19	0.091	14	<5	29	15000	7.8	1600	67	<1	8,190	140	1.16	-0.131	-0.37	7.93	8.17
	11/26/12 [FL]	2600000	98000	130000	330000	NM	NM	NM	6.7	NM	<100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	11/26/12 [F]	2400000	110000	150000	350000	64	660	4500	6.1	0.011	<100	0.16	0.02	0.18	0.13	14	<5	19	14000	7.8	1800	64	<1	8,230	143	0.07	-0.083	-0.321	7.88	8.12
	07-23-13	8480000	304000	343000	1000000	84	2000	14000	<0.5	<0.010	<1000	<0.05	<0.010	<0.05	<0.05	<5	<5	7.2	41000	8.07	5000	83	<1.0	26000	434	4.66	0.664	0.425	7.41	7.65
	12-22-14	1000000	38000	68000	120000	56	270	1900	5.5	0.012	<100	0.19	0.019	0.21	0.11	18	2.3	1.1	6300	8.42	680	54	1.3	3,500	60.8	1.58	0.248	0.007	8.17	8.41
	07-27-15	7100000	260000	300000	870000	88	1500	13000	1.1	0.018	<1000	0.11	0.011	0.12	0.05	6.8	<5.0	0.6	37000	7.83	4300	87	<1.0	23,000	393	0.97	0.369	0.131	7.46	7.7
	11-18-15	650000	27000	52000	71000	58	190	1200	5.4	0.015	<100	0.14	<0.010	0.14	0.064	25	3.3	1.0	4200	8.00	420	57	<1.0	2,200	38.8	1.80	-0.189	-0.432	8.19	8.44
	07-22-16	7500000	280000	300000	910000	92	1600	13000	1	0.026	<1000	0.092	0.01	0.1	0.088	8.3	<5.0	1.2	36000	7.99	4500	91	<1.0	24,000	411	1.77	0.559	0.321	7.43	7.67
	12-8-16	1200000	45000	70000	150000	52	290	2300	4.8	0.015	<100	0.21	<0.010	0.21	0.088	20	<5.0	2.1	7000	7.56	780	52	<1.0	4,100	72.9	3.02	-0.642	-0.883	8.2	8.44
	8-3-17	8400000	300000	340000	1000000	98	2000	13000	0.78	0.01	<1000	<0.010	0.057	0.057	0.13	<5.0	<5.0	1.5	40000	8.05	5000	97	1	25,000	405	7.68	0.698	0.46	7.35	7.59
	12-18-17	720000	28000	50000	85000	52	210	1300	5.4	0.011	<100	0.20	<0.010	0.20	0.098	21	3.5	1.6	4500	8.10	480	52	<1.0	2,400	42	0.51	-0.166	-0.409	8.26	8.51
	07-25-18	8300000	290000	330000	980000	98	1900	12000	0.81	0.022	<1000	0.051	0.012	0.063	0.076	9	2.4	1.1	39,000	8.14	4800	96	1.3	24,000	377	10.3	0.767	0.529	7.37	7.61
	11-23-18	860000	33,000	62000	98000	60	250	1600	5	<0.010	<100	0.16	0.011	0.17	0.075	24	3.9	1.8	5500	8.74	560	56	2.9	3,000	52.7	3.16	0.573	0.331	8.17	8.41
	07-29-19	6900000	250,000	280000	860000	94	1700	12000	0.69	<0.010	<1000	<0.010	<0.050	<0.050	0.060	8.7	2.6	0.96	36000	8.26	4200	92	1.6	22,000	382	1.23	0.788	0.55	7.47	7.71
	12-13-19	800000	30000	55000	92000	57	250	1600	5.2	<0.010	<100	0.16	0.016	0.18	0.068	16	3.5	2.6	5100	8.68	520	55	<1.0	2,900	51.3	5.67	0.452	0.21	8.23	8.47
	07-21-20	6700000	270000	310000	850000	92	2100	14000	0.71	<0.010	<1000	<0.050	<0.010	<0.050	0.09	8.1	2.1	0.84	39000	7.95	4300	91	<1.0	25,000	447	7.45	0.53	0.292	7.42	7.66
	12-01-20	7900000	280000	320000	960000	91	2100	15000	1.0	0.015	<1000	0.068	0.013	0.081	0.080	<5.0	1.7	0.74	39000	7.58	4700	91	<1.0	27,000	472	3.14	0.185	-0.0530	7.40	7.63
NARROWS	12-22-14	600000	24000	58000	74000	57	170	1100	5.6	0.013	<100	0.22	0.016	0.24	0.11	16	2	1	3900	8.56	450	55	1.9	2,100	36	0.1	0.403	0.16	8.15	8.4
	07-27-15	7200000	270000	300000	900000	91	1300	13000	1.2	<0.010	<1000	0.067	<0.010	0.067	0.067	7.4	<5.0	0.36	37000	7.96	4400	90	<1.0	23,000	383	3.36	0.502	0.265	7.45	7.69
	11-18-15	330000	15000	38000	36000	55	110	640	5.8	0.016	<100	0.15	<0.010	0.15	0.053	21	3.7	1.7	2400	7.86	240	55	<1.0	1,200	21.6	4.13	-0.398	-0.643	8.26	8.50
	07-22-16	7500000	270000	300000	900000	93	1400	12000	1.3	0.017	<1000	0.05	0.01	0.06	0.08	9.9	2.3	1.2	36000	7.97	4400	92	<1.0	23,000	378	5.2	0.533	0.295	7.44	7.68
	12-8-16	1000000	38000	72000	130000	61	270	1900	6.1	0.016	<100	0.21	<0.010	0.21	0.082	21	<5.0	1.2	6200	7.67	700	61	<1.0	3,500	60.8	0.65	-0.418	-0.66	8.09	8.33
	8-3-17	8300000	300000	340000	990000	97	2000	12000	1.1	0.016	<1000	<0.010	0.077	0.077	0.21	<5.0	<5.0	1.4	40000	7.8	4900	97	<1.0	24,000	392	8.83	0.45	0.213	7.36	7.59
	12-18-17	440000	18000	45000	53000	52	150	820	6.0	0.010	<100	0.21	<0.010	0.21	0.076	21	3.5	2.1	2900	7.82	330	52	<1.0	1,600	27	2.06	-0.428	-0.672	8.25	8.49
	07-25-18	6600000	240000	300000	780000	97	1700	11000	2.0	0.018	<1000	0.064	0.012	0.076	0.09	8.3	<5	0.73	34000	8.08	3900	96	1.1	20,000	334	5.38	0.641	0.404	7.44	7.68
	11-23-18	530000	21,000	50000	60000	58	180	1100	5.3	<0.010	<100	0.18	<0.010	0.18	0.076	28	4.1	1.7	3700	8.78	370	54	3.1	1,900	34.5	5.13	0.574	0.331	8.21	8.45
	07-29-19	6800000	250,000	280000	850000	93	1700	12000	1.3	<0.010	<1000	<0.010	<0.050	<0.050	0.088	7.8	<5.0 *	1.4	35000	7.88	4200	93	<1.0	22,000	376	1.51	0.415	0.177	7.47	7.70
	12-13-19	350000	14000	36000	43000	45	120	660	5.2	<0.010	<100	0.14	0.017	0.15	0.056	27	3.7	2.3	2300	8.13	270	45	<1.0	1,300	22.2	2.5	-0.246	-0.491	8.38	8.62
	07-21-20	6800000	270000	310000	880000	95	2100	14000	1.3	<0.010	<1000	<0.050	<0.010	<0.050	0.075	7.1	2.3	1.1	38000	7.91	4400	94	<1.0	25,000	443	6.12	0.503	0.265	7.41	7.64
	07-21-20 [FD]	6500000	260000	290000	840000	95	2100	14000	1.2	<0.010	<1000	<0.050	<0.010	<0.050	0.078	7.2	2.2	1.8	38000	7.93	4200	94	<1.0	24,000	435	7.67	0.493	0.256	7.43	7.67
	12-01-20	6300000	230000	260000	770000	86	1700	10000	1.6	0.012	<1000	0.085	0.013	0.098	0.074	5.6	3.7	0.59	35000	7.83	3800	86	<1.0	20,000	331	3.62	0.284	0.0470	7.55	7.79

NOTES:

FD - Field Duplicate

NM - Not Measured or not analyzed

mg/L - milligrams per liter

UCL - Upper Concentration Limit

- No applicable guideline criteria

* Elevated reporting limit due to sample matrix

** Elevated reporting limit due to turbidity

A - Total mercury analysis was preformed on nitric acid preserved sample aliquot.

1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) 2013

2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) 2017

3 - Guideline value for NH3 is based on a pH value of 8 and a temperature of 10 C

4 - Guideline for chromium is based on CR6+

5 - Guideline value for aluminum based on a pH >6.5

6 - CCME FWAL guideline values for cadmium and copper are based on a hardness value. If value is unknown, the guideline is 2µg/L. The most conservative number, based on the lowest hardness, was used.

7 - CCME FWAL guideline value for lead is based on a hardness value. If value is unknown, the guideline is 1µg/L

8 - CCME FWAL guideline value for lead is based on a hardness value. If value is unknown, the guideline is 25µg/L. The lowest conctration, most conservative, of hardness was use.

Bold Concentration exceeds Tier I EQS for surface water (freshwater)

Underline Concentration exceeds Tier I EQS for surface water (marine)

Shading Concentration exceeds CCME FWAL

Shading Concentration exceeds CCME MAL

Double Underline Concentration exceeds Upstream Calculated 95% UCL

Dashed Border Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit

Red Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit

italics Laboratory detection limit is higher than guideline criteria

This summary is to be used in conjunction with, not as a replacement of, the Laboratory Certificates of Analysis

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2020
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NSE Tier 1 EQS Fresh Water [1]		5	20	5.0	1000	5.3	-	1200	0.01	-	10	2	300	1	820	0.026	73	25	1.0	0.1	21000	0.8	-	-	300	6	30
CCME FWAL [2]		100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [6]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	7
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
NSE Tier 1 EQS Marine Water [1]		-	500	12.5	500	100	-	1200	0.12	-	-	2	-	2	-	0.016	-	8.3	2	1.5	-	21.3	-	-	100	50	10
CCME MAL [2]		-	-	12.5	-	-	-	-	0.12	1.5 [4]	-	-	-	-	-	0.016	-	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	-	-	-	-	0.9	-	190	-	70	0.189	-	-	-	-	7000	-	-	-	-	-	-
BP-1-SW	11-26-12	310	<1	6.3	47	<0.5	<2	1200	0.053	1	*<1*	<2	310	1.2	100	0.017	<4	<3	7	2.4	2300	<0.8	<20	5.5	0.98	<2	5.4
	11/26/12 [FL]	530	<1	6.4	53	<0.5	<2	1200	0.054	1.5	*<1*	<2	650	1.5	120	NM	<4	<3	6	1.8	2300	<0.8	<20	12	0.99	<2	6.9
	11/26/12 [F]	350	<1	6.2	49	<0.5	<2	1200	0.052	2	*<1*	<2	340	1.3	110	0.018	<4	<3	5.7	2	2300	<0.8	<20	6.6	0.97	<2	6.2
	07-23-13	168	<10	<10	41	<10	<20	3700	0.14	*<10*	*<4.0*	*<20*	1990	*<5.0*	109	<0.013	<20	*<20*	*<10*	<1.0	6130	<1	<20	<20	2.6	<20	*<50*
	12-22-14	110	<1.0	<1.0	19	<1.0	<2.0	480	0.028	<1.0	<0.40	<2.0	240	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	950	<0.10	<2.0	<2.0	0.41	<2.0	7.2
	07-27-15	86	<10	<10	19	<10	<20	2900	<0.10	*<10*	*<4.0*	<20	*<500*	*<5.0*	59	<0.013	<20	*<20*	*<10*	<1.0	5300	<1.0	<20	<20	2.1	<20	*<50*
	11-18-15	140	<1.0	<1.0	16	<1.0	<2.0	330	0.014	<1.0	<0.40	<2.0	410	<0.50	57	0.070	<2.0	<2.0	*<1.0*	<0.10	580	<0.10	<2.0	<2.0	0.29	<2.0	41
	07-22-16	63	<10	<10	23	<10	<20	3600	<0.10	*<10*	*<4.0*	<20	*<500*	*<5.0*	71	<0.013	<20	*<20*	*<10*	<1.0	5500	<1.0	<20	<20	2.4	<20	*<50*
	12-8-16	86	<1.0	<1.0	20	<1.0	<2.0	520	0.025	<1.0	<0.40	<2.0	280	<0.50	100	<0.013	<2.0	<2.0	<1.0	<0.10	1000	<0.10	<2.0	<2.0	0.48	<2.0	<5.0
	8-3-17	<50	<10	<10	25	<10	<20	3600	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<10*	<1.0	6100	<1.0	<20	<20	2.5	<20	*<50*
	12-18-17	95	<1.0	<1.0	17	<1.0	<2.0	340	0.020	<1.0	<0.40	<2.0	220	<0.50	60	<0.013	<2.0	<2.0	<1.0	<0.10	630	<0.10	<2.0	3.6	0.35	<2.0	<5.0
	07-25-18	58	<10	<10	23	<10	<20	3500	<0.10	*<10*	*<4.0*	*<20*	1000	*<5.0*	94	<0.013	<20	*<20*	*<10*	<1.0	5900	<1.0	<20	<20	2.5	<20	*<50*
	11-23-18	86	<1.0	<1.0	18	<1.0	<2.0	420	0.024	<1.0	<0.40	<2.0	240	<0.50	50	<0.013	<2.0	<2.0	<1.0	<0.10	730	<0.10	<2.0	<2.0	0.4	<2.0	<5.0
	07-29-19	<50	<10	<10	18	<10	<20	3100	<0.10	*<10*	*<4.0*	5.6	*<500*	*<5.0*	50	<0.013	<20	*<20*	*<10*	<1.0	5000	<1.0	<20	<20	2.4	<20	*<50*
	12-13-19	88	<1.0	<1.0	13	<1.0	<2.0	360	0.021	<1.0	<0.40	0.96	220	<0.50	51	<0.013	<2.0	<2.0	<0.5	<0.10	340	<0.10	<2.0	<2.0	0.35	<2.0	<5.0
	07-21-20	63	<1.0	<1.0	19	<1.0	<20	3200	0.11	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	44	<0.013	<20	*<20*	*<5.0*	<1.0	5500	<1.0	<20	<20	2.3	<20	*<50*
	12-01-20	<50	<10	<10	12	<10	<20	3600	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	22	0.015 [A]	<20	*<20*	*<5.0*	<1.0	5600	<1.0	<20	<20	2.5	<20	*<50*
NARROWS	12-22-14	110	<1.0	<1.0	19	<1.0	<2.0	300	0.027	<1.0	<0.40	<2.0	250	<0.50	63	<0.013	<2.0	<2.0	<1.0	<0.10	610	<0.10	<2.0	2.4	0.32	<2.0	7.3
	07-27-15	140	<10	*<10*	21	<10	<20	3100	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	100	<0.013	<20	*<20*	*<10*	<1.0	5400	<1.0	<20	<20	2.2	<20	*<50*
	11-18-15	76	1.8	<1.0	15	<1.0	<2.0	180	0.012	<1.0	<0.40	<2.0	*320*	<0.50	45	<0.013	<2.0	<2.0	*<1.0*	<0.10	370	<0.10	<2.0	<2.0	0.22	<2.0	63
	07-22-16	51	<10	*<10*	28	<10	<20	3500	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<10*	<1.0	5400	<1.0	<20	<20	2.1	<20	*<50*
	12-8-16	75	<1.0	<1.0	20	<1.0	<2.0	460	0.029	<1.0	<0.40	<2.0	250	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	890	<0.10	<2.0	<2.0	0.58	<2.0	15
	8-3-17	<50	<10	*<10*	26	<10	<20	3600	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<10*	<1.0	6100	<1.0	<20	<20	2.4	<20	*<50*
	12-18-17	110	<1.0	<1.0	17	<1.0	<2.0	210	0.018	<1.0	<0.40	<2.0	280	<0.50	72	<0.013	<2.0	<2.0	<1.0	<0.10	450	<0.10	<2.0	3.6	0.27	<2.0	5.8
	07-25-18	56	<10	*<10*	29	<10	<20	2800	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	100	<0.013	<20	*<20*	*<10*	<1.0	5000	<1.0	<20	<20	2	<20	*<50*
	11-23-18	86	<1.0	<1.0	17	<1.0	<2.0	260	0.021	<1.0	<0.40	<2.0	220	<0.50	52	<0.013	<2.0	<2.0	<1.0	<0.10	500	<0.10	<2.0	<2.0	0.32	<2.0	8.8
	07-29-19	110	<10	*<10*	21	<10	<20	3000	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<10*	<1.0	5000	<1.0	<20	<20	2.0	<20	*<50*
	12-13-19	110	<1.0	<1.0	15	<1.0	<2.0	180	0.021	<1.0	<0.40	2.7	290	<0.50	65	<0.013	<2.0	<2.0	<0.5	<0.10	660	<0.10	<2.0	<2.0	0.22	<2.0	7.2
	07-21-20	66	<10	<10	24	<10	<20	3200	0.13	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<5.0*	<1.0	5600	<1.0	<20	<20	2.5	<20	*<50*
	07-21-20 [FD]	67	<10	<10	20	<10	<20	3100	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<5.0*	<1.0	5300	<1.0	<20	<20	2.2	<20	*<50*
	12-01-20	<50	<10	<10	15	<10	<20	2600	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	38	<0.013	<20	*<20*	*<5.0*	<1.0	4500	<1.0	<20	<20	1.9	<20	*<50*

NOTES:
FD - Field Duplicate
NM - Not Measured or not analyzed
mg/L - milligrams per liter
UCL - Upper Concentration Limit
- No applicable guideline criteria
* Elevated reporting limit due to sample matrix
** Elevated reporting limit due to turbidity
A - Total mercury analysis was preformed on nitric acid preserved sample aliquot.
1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) 2013
2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) 2017
3 - Guideline value for NH3 is based on a pH value of 8 and a temperature of 10 C
4 - Guideline for chromium is based on CR6+
5 - Guideline value for aluminum based on a pH >6.5
6 - CCME FWAL guideline values for cadmium and copper are based on a hardness value. If value is unknown, the guideline is 2µg/L. The most conservative number, based on the lowest hardness, was used.
7 - CCME FWAL guideline value for lead is based on a hardness value. If value is unknown, the guideline is 1µg/L
8 - CCME FWAL guideline value for lead is based on a hardness value. If value is unknown, the guideline is 25µg/L. The lowest conctration, most conservative, of hardness was use.

Bold Concentration exceeds Tier I EQS for surface water (freshwater)
Underline Concentration exceeds Tier I EQS for surface water (marine)
Shading Concentration exceeds CCME FWAL
Shading Concentration exceeds CCME MAL
Double Underline Concentration exceeds Upstream Calculated 95% UCL
Dashed Border Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit
Red Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit
italics Laboratory detection limit is higher than guideline criteria

This summary is to be used in conjunction with, not as a replacement of, the Laboratory Certificates of Analysis

Appendix C

Laboratory Certificate

Your Project #: 20-2862
Site#: NS LANDS SW PROGRAM
Site Location: NS LANDS SW PROGRAM

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2020/12/11
Report #: R6445693
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0V9218
Received: 2020/12/01, 16:40

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonate, Bicarbonate and Hydroxide (1)	10	N/A	2020/12/09	N/A	SM 23 4500-CO2 D
Alkalinity (1)	10	N/A	2020/12/09	ATL SOP 00013	EPA 310.2 R1974 m
Benzo(b/j)fluoranthene Sum (water) (1)	10	N/A	2020/12/08	N/A	Auto Calc.
Chloride (1)	10	N/A	2020/12/09	ATL SOP 00014	SM 23 4500-Cl- E m
Colour (1)	10	N/A	2020/12/09	ATL SOP 00020	SM 23 2120C m
Conductance - water (1)	10	N/A	2020/12/09	ATL SOP 00004	SM 23 2510B m
Hardness (calculated as CaCO3) (1)	2	N/A	2020/12/10	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3) (1)	1	N/A	2020/12/11	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3) (1)	7	N/A	2020/12/09	ATL SOP 00048	Auto Calc
Mercury - Total (CVAA,LL) (1)	10	2020/12/07	2020/12/08	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS (1)	1	2020/12/08	2020/12/10	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS (1)	7	2020/12/08	2020/12/08	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS (1)	2	2020/12/08	2020/12/09	ATL SOP 00058	EPA 6020B R2 m
Ion Balance (% Difference) (1)	9	N/A	2020/12/10	N/A	Auto Calc.
Ion Balance (% Difference) (1)	1	N/A	2020/12/11	N/A	Auto Calc.
Anion and Cation Sum (1)	2	N/A	2020/12/10	N/A	Auto Calc.
Anion and Cation Sum (1)	1	N/A	2020/12/11	N/A	Auto Calc.
Anion and Cation Sum (1)	7	N/A	2020/12/09	N/A	Auto Calc.
Nitrogen Ammonia - water (1)	10	N/A	2020/12/08	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite (1)	10	N/A	2020/12/09	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite (1)	10	N/A	2020/12/09	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N) (1)	10	N/A	2020/12/10	ATL SOP 00018	ASTM D3867-16
PAH in Water by GC/MS (SIM) (1)	8	2020/12/07	2020/12/07	ATL SOP 00103	EPA 8270E R6 m
PAH in Water by GC/MS (SIM) (1)	2	2020/12/07	2020/12/08	ATL SOP 00103	EPA 8270E R6 m
pH (1, 2)	10	N/A	2020/12/09	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho (1)	10	N/A	2020/12/09	ATL SOP 00021	SM 23 4500-P E m
Sat. pH and Langelier Index (@ 20C) (1)	9	N/A	2020/12/10	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C) (1)	1	N/A	2020/12/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	9	N/A	2020/12/10	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	1	N/A	2020/12/11	ATL SOP 00049	Auto Calc.
Reactive Silica (1)	10	N/A	2020/12/09	ATL SOP 00022	EPA 366.0 m
Sulphate (1)	2	N/A	2020/12/10	ATL SOP 00023	ASTM D516-16 m

Your Project #: 20-2862
Site#: NS LANDS SW PROGRAM
Site Location: NS LANDS SW PROGRAM

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2020/12/11
Report #: R6445693
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0V9218
Received: 2020/12/01, 16:40

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sulphate (1)	8	N/A	2020/12/09	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc) (1)	9	N/A	2020/12/10	N/A	Auto Calc.
Total Dissolved Solids (TDS calc) (1)	1	N/A	2020/12/11	N/A	Auto Calc.
Organic carbon - Total (TOC) (1, 3)	9	N/A	2020/12/10	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (1, 3)	1	N/A	2020/12/11	ATL SOP 00203	SM 23 5310B m
Turbidity (1)	10	N/A	2020/12/08	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by BV Labs Bedford
(2) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(3) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

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Your Project #: 20-2862
Site#: NS LANDS SW PROGRAM
Site Location: NS LANDS SW PROGRAM

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2020/12/11
Report #: R6445693
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0V9218
Received: 2020/12/01, 16:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Natalie MacAskill, Key Account Specialist
Email: Natalie.MacAskill@bvlabs.com
Phone# (902)567-1255 Ext:17

==========

BV Labs Job #: C0V9218
Report Date: 2020/12/11

Dillon Consulting Limited
Client Project #: 20-2862
Site Location: NS LANDS SW PROGRAM

RESULTS OF ANALYSES OF WATER

BV Labs ID		OHM374		OHM396			OHM397		
Sampling Date		2020/12/01		2020/12/01			2020/12/01		
	UNITS	CB-SW	QC Batch	NRC-1-SW	RDL	QC Batch	SRC-1-SW	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	3.05	7084818	2.08	N/A	7084818	5.03	N/A	7084818
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	62	7084815	24	1.0	7084815	100	1.0	7084815
Calculated TDS	mg/L	170	7084823	120	1.0	7084823	290	1.0	7084823
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	7084815	<1.0	1.0	7084815	<1.0	1.0	7084815
Cation Sum	me/L	2.86	7084818	1.87	N/A	7084818	4.80	N/A	7084818
Hardness (CaCO3)	mg/L	87	7084816	49	1.0	7084816	140	1.0	7084816
Ion Balance (% Difference)	%	3.21	7084817	5.32	N/A	7084817	2.34	N/A	7084817
Langelier Index (@ 20C)	N/A	-0.464	7084821	-1.35		7084821	0.144		7084821
Langelier Index (@ 4C)	N/A	-0.714	7084822	-1.60		7084822	-0.106		7084822
Nitrate (N)	mg/L	0.13	7087548	0.11	0.050	7087548	0.10	0.050	7087548
Saturation pH (@ 20C)	N/A	8.13	7084821	8.77		7084821	7.75		7084821
Saturation pH (@ 4C)	N/A	8.38	7084822	9.02		7084822	8.00		7084822
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	62	7099282	24	5.0	7099282	100	25	7099282
Dissolved Chloride (Cl-)	mg/L	43	7099289	37	1.0	7099289	75	1.0	7099289
Colour	TCU	27	7099295	5.6	5.0	7099295	13	5.0	7099295
Nitrate + Nitrite (N)	mg/L	0.14	7099297	0.11	0.050	7099297	0.10	0.050	7099297
Nitrite (N)	mg/L	0.014	7099299	<0.010	0.010	7099299	<0.010	0.010	7099299
Nitrogen (Ammonia Nitrogen)	mg/L	0.063	7097094	<0.050	0.050	7097094	<0.050	0.050	7097094
Total Organic Carbon (C)	mg/L	6.8	7097272	2.1	0.50	7097762	5.0	0.50	7097579
Orthophosphate (P)	mg/L	0.024	7099296	<0.010	0.010	7099296	<0.010	0.010	7099296
pH	pH	7.66	7099326	7.42		7099326	7.90		7099326
Reactive Silica (SiO2)	mg/L	5.9	7099292	4.8	0.50	7099292	6.9	0.50	7099292
Dissolved Sulphate (SO4)	mg/L	28	7099290	27	2.0	7099290	43	2.0	7099290
Turbidity	NTU	1.8	7097387	0.27	0.10	7097387	6.1	0.10	7097387
Conductivity	uS/cm	310	7099324	220	1.0	7099324	520	1.0	7099324

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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BV Labs Job #: C0V9218
Report Date: 2020/12/11

Dillon Consulting Limited
Client Project #: 20-2862
Site Location: NS LANDS SW PROGRAM

RESULTS OF ANALYSES OF WATER

BV Labs ID		OHM398		OHM399			OHM400		OHM401		
Sampling Date		2020/12/01		2020/12/01			2020/12/01		2020/12/01		
	UNITS	COB-B-SW	RDL	COB-4-SW	RDL	QC Batch	COB-6-SW	QC Batch	WB-1-SW	RDL	QC Batch
Calculated Parameters											
Anion Sum	me/L	6.44	N/A	3.72	N/A	7084818	4.15	7084818	1.20	N/A	7084818
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	110	1.0	59	1.0	7084815	71	7084815	16	1.0	7084815
Calculated TDS	mg/L	390	1.0	220	1.0	7084823	240	7084823	69	1.0	7084823
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0	7084815	<1.0	7084815	<1.0	1.0	7084815
Cation Sum	me/L	6.08	N/A	3.46	N/A	7084818	3.87	7084818	1.10	N/A	7084818
Hardness (CaCO3)	mg/L	240	1.0	110	1.0	7084816	120	7084816	26	1.0	7084816
Ion Balance (% Difference)	%	2.88	N/A	3.62	N/A	7084817	3.49	7084817	4.35	N/A	7084817
Langelier Index (@ 20C)	N/A	0.248		-0.328		7084821	-0.0550	7084821	-1.99		7084821
Langelier Index (@ 4C)	N/A	0.000		-0.578		7084822	-0.305	7084822	-2.24		7084822
Nitrate (N)	mg/L	0.25	0.050	0.18	0.050	7087548	0.15	7084819	0.095	0.050	7084819
Saturation pH (@ 20C)	N/A	7.53		8.04		7084821	7.94	7084821	9.21		7084821
Saturation pH (@ 4C)	N/A	7.77		8.29		7084822	8.19	7084822	9.46		7084822
Inorganics											
Total Alkalinity (Total as CaCO3)	mg/L	110	25	60	5.0	7099282	72	7099282	16	5.0	7099282
Dissolved Chloride (Cl-)	mg/L	43	1.0	47	1.0	7099289	56	7099289	26	1.0	7099289
Colour	TCU	<5.0	5.0	14	5.0	7099295	9.8	7099295	37	5.0	7099295
Nitrate + Nitrite (N)	mg/L	0.25	0.050	0.19	0.050	7099297	0.16	7099297	0.095	0.050	7099297
Nitrite (N)	mg/L	<0.010	0.010	0.010	0.010	7099299	0.010	7099299	<0.010	0.010	7099299
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	0.072	0.050	7097094	<0.050	7097094	<0.050	0.050	7097144
Total Organic Carbon (C)	mg/L	2.4	0.50	2.3	0.50	7097272	<5.0 (1)	7102189	<5.0 (1)	5.0	7097762
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	7099296	<0.010	7099296	<0.010	0.010	7099296
pH	pH	7.77		7.71		7099326	7.88	7099326	7.22		7099326
Reactive Silica (SiO2)	mg/L	11	0.50	8.2	0.50	7099292	7.4	7099292	2.9	0.50	7099292
Dissolved Sulphate (SO4)	mg/L	150	10	57	2.0	7099290	54	7099290	7.0	2.0	7099290
Turbidity	NTU	0.42	0.10	0.79	0.10	7097387	2.3	7097387	2.0	0.10	7097387
Conductivity	uS/cm	630	1.0	380	1.0	7099324	430	7099324	120	1.0	7099324

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to turbidity.

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Report Date: 2020/12/11

Dillon Consulting Limited
Client Project #: 20-2862
Site Location: NS LANDS SW PROGRAM

RESULTS OF ANALYSES OF WATER

BV Labs ID		OHM405			OHM409			OHM412		
Sampling Date		2020/12/01			2020/12/01			2020/12/01		
	UNITS	NARROWS	RDL	QC Batch	BP-1-SW	RDL	QC Batch	FD-02	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	331	N/A	7084818	472	N/A	7084818	1.26	N/A	7084818
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	86	1.0	7084815	91	1.0	7084815	18	1.0	7084815
Calculated TDS	mg/L	20000	1.0	7084823	27000	1.0	7084823	72	1.0	7084823
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	7084815	<1.0	1.0	7084815	<1.0	1.0	7084815
Cation Sum	me/L	356	N/A	7084818	443	N/A	7084818	1.12	N/A	7084818
Hardness (CaCO3)	mg/L	3800	1.0	7084816	4700	1.0	7084816	26	1.0	7084816
Ion Balance (% Difference)	%	3.62	N/A	7084817	3.14	N/A	7084817	5.88	N/A	7084817
Langelier Index (@ 20C)	N/A	0.284		7084821	0.185		7084821	-1.89		7084821
Langelier Index (@ 4C)	N/A	0.0470		7084822	-0.0530		7084822	-2.14		7084822
Nitrate (N)	mg/L	0.085	0.050	7084819	0.068	0.050	7084819	0.098	0.050	7084819
Saturation pH (@ 20C)	N/A	7.55		7084821	7.40		7084821	9.17		7084821
Saturation pH (@ 4C)	N/A	7.79		7084822	7.63		7084822	9.43		7084822
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	86	5.0	7099282	91	5.0	7099282	18	5.0	7099300
Dissolved Chloride (Cl-)	mg/L	10000	120	7099289	15000	500	7099289	26	1.0	7099303
Colour	TCU	5.6	5.0	7099295	<5.0	5.0	7099295	38	5.0	7099308
Nitrate + Nitrite (N)	mg/L	0.098	0.050	7099297	0.081	0.050	7099297	0.098	0.050	7099317
Nitrite (N)	mg/L	0.013	0.010	7099299	0.013	0.010	7099299	<0.010	0.010	7099320
Nitrogen (Ammonia Nitrogen)	mg/L	0.074	0.050	7097094	0.080	0.050	7097094	<0.050	0.050	7097094
Total Organic Carbon (C)	mg/L	3.7	0.50	7097272	1.7	0.50	7097579	5.4	0.50	7097272
Orthophosphate (P)	mg/L	0.012	0.010	7099296	0.015	0.010	7099296	<0.010	0.010	7099314
pH	pH	7.83		7099326	7.58		7099386	7.29		7099386
Reactive Silica (SiO2)	mg/L	1.6	0.50	7099292	1.0	0.50	7099292	3.2	0.50	7099306
Dissolved Sulphate (SO4)	mg/L	1700	100	7099290	2100	100	7099290	7.5	2.0	7099304
Turbidity	NTU	0.59	0.10	7097387	0.74	0.10	7097387	5.1	0.10	7097387
Conductivity	uS/cm	35000	1.0	7099324	39000	1.0	7099382	130	1.0	7099382

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		OHM374	OHM396	OHM397	OHM398	OHM399	OHM400	OHM401		
Sampling Date		2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01		
	UNITS	CB-SW	NRC-1-SW	SRC-1-SW	COB-B-SW	COB-4-SW	COB-6-SW	WB-1-SW	RDL	QC Batch
Metals										
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	7095406

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		OHM405	OHM409	OHM412		
Sampling Date		2020/12/01	2020/12/01	2020/12/01		
	UNITS	NARROWS	BP-1-SW	FD-02	RDL	QC Batch
Metals						
Total Mercury (Hg)	ug/L	<0.013	0.015 (1)	<0.013	0.013	7095406

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Total mercury analysis was performed on a nitric acid preserved sample aliquot.

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BV Labs Job #: C0V9218
Report Date: 2020/12/11

Dillon Consulting Limited
Client Project #: 20-2862
Site Location: NS LANDS SW PROGRAM

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		OHM374	OHM396	OHM397	OHM398	OHM399	OHM400	OHM401		
Sampling Date		2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01		
	UNITS	CB-SW	NRC-1-SW	SRC-1-SW	COB-B-SW	COB-4-SW	COB-6-SW	WB-1-SW	RDL	QC Batch
Metals										
Total Aluminum (Al)	ug/L	45	14	190	6.4	41	52	110	5.0	7097141
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7097141
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7097141
Total Barium (Ba)	ug/L	15	13	16	12	24	21	14	1.0	7097141
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7097141
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7097141
Total Boron (B)	ug/L	<50	<50	<50	52	<50	<50	<50	50	7097141
Total Cadmium (Cd)	ug/L	0.011	0.011	0.017	<0.010	<0.010	<0.010	0.027	0.010	7097141
Total Calcium (Ca)	ug/L	29000	16000	46000	78000	38000	41000	8100	100	7097141
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7097141
Total Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7097141
Total Copper (Cu)	ug/L	1.4	0.54	1.9	<0.50	0.75	1.1	0.71	0.50	7097141
Total Iron (Fe)	ug/L	160	62	280	96	160	120	330	50	7097141
Total Lead (Pb)	ug/L	<0.50	<0.50	0.72	<0.50	<0.50	<0.50	<0.50	0.50	7097141
Total Magnesium (Mg)	ug/L	3700	2200	5000	11000	4000	4100	1500	100	7097141
Total Manganese (Mn)	ug/L	83	37	190	210	160	56	69	2.0	7097141
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7097141
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7097141
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	<100	<100	100	7097141
Total Potassium (K)	ug/L	1500	760	2300	3000	1700	1800	580	100	7097141
Total Selenium (Se)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7097141
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7097141
Total Sodium (Na)	ug/L	25000	20000	47000	28000	27000	33000	13000	100	7097141
Total Strontium (Sr)	ug/L	99	47	150	220	170	180	57	2.0	7097141
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7097141
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7097141
Total Titanium (Ti)	ug/L	<2.0	<2.0	5.9	<2.0	<2.0	<2.0	2.4	2.0	7097141
Total Uranium (U)	ug/L	0.11	<0.10	0.34	0.36	0.17	0.22	<0.10	0.10	7097141
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7097141
Total Zinc (Zn)	ug/L	6.5	<5.0	<5.0	<5.0	<5.0	<5.0	7.1	5.0	7097141

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0V9218
Report Date: 2020/12/11

Dillon Consulting Limited
Client Project #: 20-2862
Site Location: NS LANDS SW PROGRAM

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		OHM405		OHM409			OHM412		
Sampling Date		2020/12/01		2020/12/01			2020/12/01		
	UNITS	NARROWS	QC Batch	BP-1-SW	RDL	QC Batch	FD-02	RDL	QC Batch
Metals									
Total Aluminum (Al)	ug/L	<50	7097141	<50	50	7097157	97	5.0	7097141
Total Antimony (Sb)	ug/L	<10	7097141	<10	10	7097157	<1.0	1.0	7097141
Total Arsenic (As)	ug/L	<10	7097141	<10	10	7097157	<1.0	1.0	7097141
Total Barium (Ba)	ug/L	15	7097141	12	10	7097157	14	1.0	7097141
Total Beryllium (Be)	ug/L	<10	7097141	<10	10	7097157	<1.0	1.0	7097141
Total Bismuth (Bi)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Boron (B)	ug/L	2600	7097141	3600	500	7097157	<50	50	7097141
Total Cadmium (Cd)	ug/L	<0.10	7097141	<0.10	0.10	7097157	0.013	0.010	7097141
Total Calcium (Ca)	ug/L	260000	7097141	320000	1000	7097157	8000	100	7097141
Total Chromium (Cr)	ug/L	<10	7097141	<10	10	7097157	<1.0	1.0	7097141
Total Cobalt (Co)	ug/L	<4.0	7097141	<4.0	4.0	7097157	<0.40	0.40	7097141
Total Copper (Cu)	ug/L	<5.0	7097141	<5.0	5.0	7097157	0.65	0.50	7097141
Total Iron (Fe)	ug/L	<500	7097141	<500	500	7097157	300	50	7097141
Total Lead (Pb)	ug/L	<5.0	7097141	<5.0	5.0	7097157	<0.50	0.50	7097141
Total Magnesium (Mg)	ug/L	770000	7097141	960000	1000	7097157	1500	100	7097141
Total Manganese (Mn)	ug/L	38	7097141	22	20	7097157	65	2.0	7097141
Total Molybdenum (Mo)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Nickel (Ni)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Phosphorus (P)	ug/L	<1000	7097141	<1000	1000	7097157	<100	100	7097141
Total Potassium (K)	ug/L	230000	7097141	280000	1000	7097157	580	100	7097141
Total Selenium (Se)	ug/L	<5.0	7097141	<5.0	5.0	7097157	<0.50	0.50	7097141
Total Silver (Ag)	ug/L	<1.0	7097141	<1.0	1.0	7097157	<0.10	0.10	7097141
Total Sodium (Na)	ug/L	6300000	7097141	7900000	1000	7097157	13000	100	7097141
Total Strontium (Sr)	ug/L	4500	7097141	5600	20	7097157	58	2.0	7097141
Total Thallium (Tl)	ug/L	<1.0	7097141	<1.0	1.0	7097157	<0.10	0.10	7097141
Total Tin (Sn)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Titanium (Ti)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Uranium (U)	ug/L	1.9	7097141	2.5	1.0	7097157	<0.10	0.10	7097141
Total Vanadium (V)	ug/L	<20	7097141	<20	20	7097157	<2.0	2.0	7097141
Total Zinc (Zn)	ug/L	<50	7097141	<50	50	7097157	<5.0	5.0	7097141

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		OHM374	OHM396	OHM397	OHM398	OHM399	OHM400	OHM401		
Sampling Date		2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01	2020/12/01		
	UNITS	CB-SW	NRC-1-SW	SRC-1-SW	COB-B-SW	COB-4-SW	COB-6-SW	WB-1-SW	RDL	QC Batch
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7095287
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7095287
Acenaphthene	ug/L	0.028	<0.010	<0.010	<0.010	0.025	0.012	<0.010	0.010	7095287
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(b/j)fluoranthene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7085691
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Dibenzo(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Fluoranthene	ug/L	0.014	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.010	7095287
Fluorene	ug/L	0.017	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	0.010	7095287
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7095287
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Phenanthrene	ug/L	0.024	<0.010	0.011	<0.010	0.014	0.010	<0.010	0.010	7095287
Pyrene	ug/L	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7095287
Surrogate Recovery (%)										
D10-Anthracene	%	103	107	102	116	95	108	103		7095287
D14-Terphenyl	%	105	109	103	122	98	113	107		7095287
D8-Acenaphthylene	%	96	99	95	104	90	105	97		7095287

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		OHM405	OHM409	OHM412		
Sampling Date		2020/12/01	2020/12/01	2020/12/01		
	UNITS	NARROWS	BP-1-SW	FD-02	RDL	QC Batch
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	0.050	7095287
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	0.050	7095287
Acenaphthene	ug/L	0.024	0.017	<0.010	0.010	7095287
Acenaphthylene	ug/L	0.026	0.018	<0.010	0.010	7095287
Anthracene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(b/j)fluoranthene	ug/L	<0.020	<0.020	<0.020	0.020	7085691
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Chrysene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Dibenzo(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Fluoranthene	ug/L	0.012	0.010	<0.010	0.010	7095287
Fluorene	ug/L	0.020	0.014	<0.010	0.010	7095287
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Naphthalene	ug/L	<0.20	<0.20	<0.20	0.20	7095287
Perylene	ug/L	<0.010	<0.010	<0.010	0.010	7095287
Phenanthrene	ug/L	0.021	0.019	<0.010	0.010	7095287
Pyrene	ug/L	0.012	<0.010	<0.010	0.010	7095287
Surrogate Recovery (%)						
D10-Anthracene	%	100	109	99		7095287
D14-Terphenyl	%	107	113	103		7095287
D8-Acenaphthylene	%	94	104	97		7095287

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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GENERAL COMMENTS

Sample OHM374 [CB-SW] : ortho-Phosphate > Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample OHM396 [NRC-1-SW] : Poor RCAp Ion Balance due to sample matrix.

Sample OHM405 [NARROWS] : Elevated reporting limits for trace metals due to sample matrix.
ortho-Phosphate > Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample OHM409 [BP-1-SW] : Elevated reporting limits for trace metals due to sample matrix. ortho-Phosphate > Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample OHM412 [FD-02] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7095287	LGE	Matrix Spike [OHM396-06]	D10-Anthracene	2020/12/07		102	%	50 - 130
			D14-Terphenyl	2020/12/07		105	%	50 - 130
			D8-Acenaphthylene	2020/12/07		96	%	50 - 130
			1-Methylnaphthalene	2020/12/07		81	%	50 - 130
			2-Methylnaphthalene	2020/12/07		79	%	50 - 130
			Acenaphthene	2020/12/07		87	%	50 - 130
			Acenaphthylene	2020/12/07		82	%	50 - 130
			Anthracene	2020/12/07		91	%	50 - 130
			Benzo(a)anthracene	2020/12/07		88	%	50 - 130
			Benzo(a)pyrene	2020/12/07		84	%	50 - 130
			Benzo(b)fluoranthene	2020/12/07		89	%	50 - 130
			Benzo(g,h,i)perylene	2020/12/07		86	%	50 - 130
			Benzo(j)fluoranthene	2020/12/07		85	%	50 - 130
			Benzo(k)fluoranthene	2020/12/07		86	%	50 - 130
			Chrysene	2020/12/07		96	%	50 - 130
			Dibenzo(a,h)anthracene	2020/12/07		79	%	50 - 130
			Fluoranthene	2020/12/07		90	%	50 - 130
			Fluorene	2020/12/07		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2020/12/07		82	%	50 - 130
			Naphthalene	2020/12/07		91	%	50 - 130
			Perylene	2020/12/07		86	%	50 - 130
			Phenanthrene	2020/12/07		92	%	50 - 130
			Pyrene	2020/12/07		94	%	50 - 130
7095287	LGE	Spiked Blank	D10-Anthracene	2020/12/07		112	%	50 - 130
			D14-Terphenyl	2020/12/07		114	%	50 - 130
			D8-Acenaphthylene	2020/12/07		109	%	50 - 130
			1-Methylnaphthalene	2020/12/07		89	%	50 - 130
			2-Methylnaphthalene	2020/12/07		89	%	50 - 130
			Acenaphthene	2020/12/07		96	%	50 - 130
			Acenaphthylene	2020/12/07		91	%	50 - 130
			Anthracene	2020/12/07		99	%	50 - 130
			Benzo(a)anthracene	2020/12/07		93	%	50 - 130
			Benzo(a)pyrene	2020/12/07		88	%	50 - 130
			Benzo(b)fluoranthene	2020/12/07		94	%	50 - 130
			Benzo(g,h,i)perylene	2020/12/07		89	%	50 - 130
			Benzo(j)fluoranthene	2020/12/07		91	%	50 - 130
			Benzo(k)fluoranthene	2020/12/07		88	%	50 - 130
			Chrysene	2020/12/07		99	%	50 - 130
			Dibenzo(a,h)anthracene	2020/12/07		81	%	50 - 130
			Fluoranthene	2020/12/07		97	%	50 - 130
			Fluorene	2020/12/07		100	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2020/12/07		85	%	50 - 130
			Naphthalene	2020/12/07		99	%	50 - 130
			Perylene	2020/12/07		90	%	50 - 130
			Phenanthrene	2020/12/07		100	%	50 - 130
			Pyrene	2020/12/07		101	%	50 - 130
7095287	LGE	Method Blank	D10-Anthracene	2020/12/07		111	%	50 - 130
			D14-Terphenyl	2020/12/07		113	%	50 - 130
			D8-Acenaphthylene	2020/12/07		103	%	50 - 130
			1-Methylnaphthalene	2020/12/07	<0.050		ug/L	
			2-Methylnaphthalene	2020/12/07	<0.050		ug/L	
			Acenaphthene	2020/12/07	<0.010		ug/L	
			Acenaphthylene	2020/12/07	<0.010		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Anthracene	2020/12/07	<0.010		ug/L	
			Benzo(a)anthracene	2020/12/07	<0.010		ug/L	
			Benzo(a)pyrene	2020/12/07	<0.010		ug/L	
			Benzo(b)fluoranthene	2020/12/07	<0.010		ug/L	
			Benzo(g,h,i)perylene	2020/12/07	<0.010		ug/L	
			Benzo(j)fluoranthene	2020/12/07	<0.010		ug/L	
			Benzo(k)fluoranthene	2020/12/07	<0.010		ug/L	
			Chrysene	2020/12/07	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2020/12/07	<0.010		ug/L	
			Fluoranthene	2020/12/07	<0.010		ug/L	
			Fluorene	2020/12/07	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2020/12/07	<0.010		ug/L	
			Naphthalene	2020/12/07	<0.20		ug/L	
			Perylene	2020/12/07	<0.010		ug/L	
			Phenanthrene	2020/12/07	<0.010		ug/L	
			Pyrene	2020/12/07	<0.010		ug/L	
7095287	LGE	RPD [OHM374-06]	1-Methylnaphthalene	2020/12/07	NC		%	40
			2-Methylnaphthalene	2020/12/07	NC		%	40
			Acenaphthene	2020/12/07	4.5		%	40
			Acenaphthylene	2020/12/07	NC		%	40
			Anthracene	2020/12/07	NC		%	40
			Benzo(a)anthracene	2020/12/07	NC		%	40
			Benzo(a)pyrene	2020/12/07	NC		%	40
			Benzo(b)fluoranthene	2020/12/07	NC		%	40
			Benzo(g,h,i)perylene	2020/12/07	NC		%	40
			Benzo(j)fluoranthene	2020/12/07	NC		%	40
			Benzo(k)fluoranthene	2020/12/07	NC		%	40
			Chrysene	2020/12/07	NC		%	40
			Dibenzo(a,h)anthracene	2020/12/07	NC		%	40
			Fluoranthene	2020/12/07	9.4		%	40
			Fluorene	2020/12/07	5.2		%	40
			Indeno(1,2,3-cd)pyrene	2020/12/07	NC		%	40
			Naphthalene	2020/12/07	NC		%	40
			Perylene	2020/12/07	NC		%	40
			Phenanthrene	2020/12/07	3.7		%	40
			Pyrene	2020/12/07	9.3		%	40
7095406	NHU	Matrix Spike [OHM396-05]	Total Mercury (Hg)	2020/12/08		99	%	80 - 120
7095406	NHU	Spiked Blank	Total Mercury (Hg)	2020/12/08		102	%	80 - 120
7095406	NHU	Method Blank	Total Mercury (Hg)	2020/12/08	<0.013		ug/L	
7095406	NHU	RPD [OHM374-05]	Total Mercury (Hg)	2020/12/08	NC		%	20
7097094	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2020/12/08		NC	%	80 - 120
7097094	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2020/12/08		104	%	80 - 120
7097094	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2020/12/08	<0.050		mg/L	
7097094	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2020/12/08	0.25		%	20
7097141	BAN	Matrix Spike	Total Aluminum (Al)	2020/12/09		95	%	80 - 120
			Total Antimony (Sb)	2020/12/09		102	%	80 - 120
			Total Arsenic (As)	2020/12/09		93	%	80 - 120
			Total Barium (Ba)	2020/12/09		93	%	80 - 120
			Total Beryllium (Be)	2020/12/09		105	%	80 - 120
			Total Bismuth (Bi)	2020/12/09		98	%	80 - 120
			Total Boron (B)	2020/12/09		109	%	80 - 120
			Total Cadmium (Cd)	2020/12/09		94	%	80 - 120
			Total Calcium (Ca)	2020/12/09		97	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Chromium (Cr)	2020/12/09		94	%	80 - 120
			Total Cobalt (Co)	2020/12/09		95	%	80 - 120
			Total Copper (Cu)	2020/12/09		95	%	80 - 120
			Total Iron (Fe)	2020/12/09		99	%	80 - 120
			Total Lead (Pb)	2020/12/09		95	%	80 - 120
			Total Magnesium (Mg)	2020/12/09		101	%	80 - 120
			Total Manganese (Mn)	2020/12/09		97	%	80 - 120
			Total Molybdenum (Mo)	2020/12/09		100	%	80 - 120
			Total Nickel (Ni)	2020/12/09		97	%	80 - 120
			Total Phosphorus (P)	2020/12/09		101	%	80 - 120
			Total Potassium (K)	2020/12/09		99	%	80 - 120
			Total Selenium (Se)	2020/12/09		97	%	80 - 120
			Total Silver (Ag)	2020/12/09		96	%	80 - 120
			Total Sodium (Na)	2020/12/09		94	%	80 - 120
			Total Strontium (Sr)	2020/12/09		94	%	80 - 120
			Total Thallium (Tl)	2020/12/09		98	%	80 - 120
			Total Tin (Sn)	2020/12/09		96	%	80 - 120
			Total Titanium (Ti)	2020/12/09		97	%	80 - 120
			Total Uranium (U)	2020/12/09		103	%	80 - 120
			Total Vanadium (V)	2020/12/09		97	%	80 - 120
			Total Zinc (Zn)	2020/12/09		89	%	80 - 120
7097141	BAN	Spiked Blank	Total Aluminum (Al)	2020/12/08		100	%	80 - 120
			Total Antimony (Sb)	2020/12/08		102	%	80 - 120
			Total Arsenic (As)	2020/12/08		95	%	80 - 120
			Total Barium (Ba)	2020/12/08		93	%	80 - 120
			Total Beryllium (Be)	2020/12/08		90	%	80 - 120
			Total Bismuth (Bi)	2020/12/08		96	%	80 - 120
			Total Boron (B)	2020/12/08		93	%	80 - 120
			Total Cadmium (Cd)	2020/12/08		94	%	80 - 120
			Total Calcium (Ca)	2020/12/08		99	%	80 - 120
			Total Chromium (Cr)	2020/12/08		95	%	80 - 120
			Total Cobalt (Co)	2020/12/08		95	%	80 - 120
			Total Copper (Cu)	2020/12/08		95	%	80 - 120
			Total Iron (Fe)	2020/12/08		101	%	80 - 120
			Total Lead (Pb)	2020/12/08		95	%	80 - 120
			Total Magnesium (Mg)	2020/12/08		102	%	80 - 120
			Total Manganese (Mn)	2020/12/08		97	%	80 - 120
			Total Molybdenum (Mo)	2020/12/08		100	%	80 - 120
			Total Nickel (Ni)	2020/12/08		97	%	80 - 120
			Total Phosphorus (P)	2020/12/08		99	%	80 - 120
			Total Potassium (K)	2020/12/08		94	%	80 - 120
			Total Selenium (Se)	2020/12/08		98	%	80 - 120
			Total Silver (Ag)	2020/12/08		96	%	80 - 120
			Total Sodium (Na)	2020/12/08		96	%	80 - 120
			Total Strontium (Sr)	2020/12/08		99	%	80 - 120
			Total Thallium (Tl)	2020/12/08		97	%	80 - 120
			Total Tin (Sn)	2020/12/08		98	%	80 - 120
			Total Titanium (Ti)	2020/12/08		101	%	80 - 120
			Total Uranium (U)	2020/12/08		102	%	80 - 120
			Total Vanadium (V)	2020/12/08		97	%	80 - 120
			Total Zinc (Zn)	2020/12/08		98	%	80 - 120
7097141	BAN	Method Blank	Total Aluminum (Al)	2020/12/08	<5.0		ug/L	
			Total Antimony (Sb)	2020/12/08	<1.0		ug/L	
			Total Arsenic (As)	2020/12/08	<1.0		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Barium (Ba)	2020/12/08	<1.0		ug/L	
			Total Beryllium (Be)	2020/12/08	<1.0		ug/L	
			Total Bismuth (Bi)	2020/12/08	<2.0		ug/L	
			Total Boron (B)	2020/12/08	<50		ug/L	
			Total Cadmium (Cd)	2020/12/08	<0.010		ug/L	
			Total Calcium (Ca)	2020/12/08	<100		ug/L	
			Total Chromium (Cr)	2020/12/08	<1.0		ug/L	
			Total Cobalt (Co)	2020/12/08	<0.40		ug/L	
			Total Copper (Cu)	2020/12/08	<0.50		ug/L	
			Total Iron (Fe)	2020/12/08	<50		ug/L	
			Total Lead (Pb)	2020/12/08	<0.50		ug/L	
			Total Magnesium (Mg)	2020/12/08	<100		ug/L	
			Total Manganese (Mn)	2020/12/08	<2.0		ug/L	
			Total Molybdenum (Mo)	2020/12/08	<2.0		ug/L	
			Total Nickel (Ni)	2020/12/08	<2.0		ug/L	
			Total Phosphorus (P)	2020/12/08	<100		ug/L	
			Total Potassium (K)	2020/12/08	<100		ug/L	
			Total Selenium (Se)	2020/12/08	<0.50		ug/L	
			Total Silver (Ag)	2020/12/08	<0.10		ug/L	
			Total Sodium (Na)	2020/12/08	<100		ug/L	
			Total Strontium (Sr)	2020/12/08	<2.0		ug/L	
			Total Thallium (Tl)	2020/12/08	<0.10		ug/L	
			Total Tin (Sn)	2020/12/08	<2.0		ug/L	
			Total Titanium (Ti)	2020/12/08	<2.0		ug/L	
			Total Uranium (U)	2020/12/08	<0.10		ug/L	
			Total Vanadium (V)	2020/12/08	<2.0		ug/L	
			Total Zinc (Zn)	2020/12/08	<5.0		ug/L	
7097141	BAN	RPD	Total Aluminum (Al)	2020/12/09	NC		%	20
			Total Antimony (Sb)	2020/12/09	NC		%	20
			Total Arsenic (As)	2020/12/09	NC		%	20
			Total Barium (Ba)	2020/12/09	1.4		%	20
			Total Beryllium (Be)	2020/12/09	NC		%	20
			Total Bismuth (Bi)	2020/12/09	NC		%	20
			Total Boron (B)	2020/12/09	NC		%	20
			Total Cadmium (Cd)	2020/12/09	11		%	20
			Total Calcium (Ca)	2020/12/09	2.2		%	20
			Total Chromium (Cr)	2020/12/09	NC		%	20
			Total Cobalt (Co)	2020/12/09	NC		%	20
			Total Copper (Cu)	2020/12/09	1.3		%	20
			Total Iron (Fe)	2020/12/09	NC		%	20
			Total Lead (Pb)	2020/12/09	NC		%	20
			Total Magnesium (Mg)	2020/12/09	2.4		%	20
			Total Manganese (Mn)	2020/12/09	NC		%	20
			Total Molybdenum (Mo)	2020/12/09	NC		%	20
			Total Nickel (Ni)	2020/12/09	NC		%	20
			Total Phosphorus (P)	2020/12/09	7.8		%	20
			Total Potassium (K)	2020/12/09	2.2		%	20
			Total Selenium (Se)	2020/12/09	NC		%	20
			Total Silver (Ag)	2020/12/09	NC		%	20
			Total Sodium (Na)	2020/12/09	1.1		%	20
			Total Strontium (Sr)	2020/12/09	1.8		%	20
			Total Thallium (Tl)	2020/12/09	NC		%	20
			Total Tin (Sn)	2020/12/09	NC		%	20
			Total Titanium (Ti)	2020/12/09	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Uranium (U)	2020/12/09	NC		%	20
			Total Vanadium (V)	2020/12/09	NC		%	20
			Total Zinc (Zn)	2020/12/09	2.0		%	20
7097144	MCN	Matrix Spike [OHM401-03]	Nitrogen (Ammonia Nitrogen)	2020/12/08		103	%	80 - 120
7097144	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2020/12/08		106	%	80 - 120
7097144	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2020/12/08	<0.050		mg/L	
7097144	MCN	RPD [OHM401-03]	Nitrogen (Ammonia Nitrogen)	2020/12/08	NC		%	20
7097157	BAN	Matrix Spike	Total Aluminum (Al)	2020/12/09		101	%	80 - 120
			Total Antimony (Sb)	2020/12/09		105	%	80 - 120
			Total Arsenic (As)	2020/12/09		94	%	80 - 120
			Total Barium (Ba)	2020/12/09		93	%	80 - 120
			Total Beryllium (Be)	2020/12/09		87	%	80 - 120
			Total Bismuth (Bi)	2020/12/09		97	%	80 - 120
			Total Boron (B)	2020/12/09		87	%	80 - 120
			Total Cadmium (Cd)	2020/12/09		94	%	80 - 120
			Total Calcium (Ca)	2020/12/09		98	%	80 - 120
			Total Chromium (Cr)	2020/12/09		92	%	80 - 120
			Total Cobalt (Co)	2020/12/09		92	%	80 - 120
			Total Copper (Cu)	2020/12/09		91	%	80 - 120
			Total Iron (Fe)	2020/12/09		98	%	80 - 120
			Total Lead (Pb)	2020/12/09		95	%	80 - 120
			Total Magnesium (Mg)	2020/12/09		100	%	80 - 120
			Total Manganese (Mn)	2020/12/09		94	%	80 - 120
			Total Molybdenum (Mo)	2020/12/09		101	%	80 - 120
			Total Nickel (Ni)	2020/12/09		95	%	80 - 120
			Total Phosphorus (P)	2020/12/09		100	%	80 - 120
			Total Potassium (K)	2020/12/09		98	%	80 - 120
			Total Selenium (Se)	2020/12/09		97	%	80 - 120
			Total Silver (Ag)	2020/12/09		98	%	80 - 120
			Total Strontium (Sr)	2020/12/09		97	%	80 - 120
			Total Thallium (Tl)	2020/12/09		98	%	80 - 120
			Total Tin (Sn)	2020/12/09		98	%	80 - 120
			Total Titanium (Ti)	2020/12/09		95	%	80 - 120
			Total Uranium (U)	2020/12/09		103	%	80 - 120
			Total Vanadium (V)	2020/12/09		95	%	80 - 120
			Total Zinc (Zn)	2020/12/09		96	%	80 - 120
7097157	BAN	Spiked Blank	Total Aluminum (Al)	2020/12/09		101	%	80 - 120
			Total Antimony (Sb)	2020/12/09		105	%	80 - 120
			Total Arsenic (As)	2020/12/09		95	%	80 - 120
			Total Barium (Ba)	2020/12/09		94	%	80 - 120
			Total Beryllium (Be)	2020/12/09		89	%	80 - 120
			Total Bismuth (Bi)	2020/12/09		98	%	80 - 120
			Total Boron (B)	2020/12/09		90	%	80 - 120
			Total Cadmium (Cd)	2020/12/09		95	%	80 - 120
			Total Calcium (Ca)	2020/12/09		99	%	80 - 120
			Total Chromium (Cr)	2020/12/09		95	%	80 - 120
			Total Cobalt (Co)	2020/12/09		96	%	80 - 120
			Total Copper (Cu)	2020/12/09		94	%	80 - 120
			Total Iron (Fe)	2020/12/09		100	%	80 - 120
			Total Lead (Pb)	2020/12/09		96	%	80 - 120
			Total Magnesium (Mg)	2020/12/09		101	%	80 - 120
			Total Manganese (Mn)	2020/12/09		98	%	80 - 120
			Total Molybdenum (Mo)	2020/12/09		103	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Nickel (Ni)	2020/12/09		98	%	80 - 120
			Total Phosphorus (P)	2020/12/09		100	%	80 - 120
			Total Potassium (K)	2020/12/09		96	%	80 - 120
			Total Selenium (Se)	2020/12/09		98	%	80 - 120
			Total Silver (Ag)	2020/12/09		95	%	80 - 120
			Total Sodium (Na)	2020/12/09		98	%	80 - 120
			Total Strontium (Sr)	2020/12/09		99	%	80 - 120
			Total Thallium (Tl)	2020/12/09		98	%	80 - 120
			Total Tin (Sn)	2020/12/09		97	%	80 - 120
			Total Titanium (Ti)	2020/12/09		98	%	80 - 120
			Total Uranium (U)	2020/12/09		102	%	80 - 120
			Total Vanadium (V)	2020/12/09		98	%	80 - 120
			Total Zinc (Zn)	2020/12/09		99	%	80 - 120
7097157	BAN	Method Blank	Total Aluminum (Al)	2020/12/09	<5.0		ug/L	
			Total Antimony (Sb)	2020/12/09	<1.0		ug/L	
			Total Arsenic (As)	2020/12/09	<1.0		ug/L	
			Total Barium (Ba)	2020/12/09	<1.0		ug/L	
			Total Beryllium (Be)	2020/12/09	<1.0		ug/L	
			Total Bismuth (Bi)	2020/12/09	<2.0		ug/L	
			Total Boron (B)	2020/12/09	<50		ug/L	
			Total Cadmium (Cd)	2020/12/09	<0.010		ug/L	
			Total Calcium (Ca)	2020/12/09	<100		ug/L	
			Total Chromium (Cr)	2020/12/09	<1.0		ug/L	
			Total Cobalt (Co)	2020/12/09	<0.40		ug/L	
			Total Copper (Cu)	2020/12/09	<0.50		ug/L	
			Total Iron (Fe)	2020/12/09	<50		ug/L	
			Total Lead (Pb)	2020/12/09	<0.50		ug/L	
			Total Magnesium (Mg)	2020/12/09	<100		ug/L	
			Total Manganese (Mn)	2020/12/09	<2.0		ug/L	
			Total Molybdenum (Mo)	2020/12/09	<2.0		ug/L	
			Total Nickel (Ni)	2020/12/09	<2.0		ug/L	
			Total Phosphorus (P)	2020/12/09	<100		ug/L	
			Total Potassium (K)	2020/12/09	<100		ug/L	
			Total Selenium (Se)	2020/12/09	<0.50		ug/L	
			Total Silver (Ag)	2020/12/09	<0.10		ug/L	
			Total Sodium (Na)	2020/12/09	<100		ug/L	
			Total Strontium (Sr)	2020/12/09	<2.0		ug/L	
			Total Thallium (Tl)	2020/12/09	<0.10		ug/L	
			Total Tin (Sn)	2020/12/09	<2.0		ug/L	
			Total Titanium (Ti)	2020/12/09	<2.0		ug/L	
			Total Uranium (U)	2020/12/09	<0.10		ug/L	
			Total Vanadium (V)	2020/12/09	<2.0		ug/L	
			Total Zinc (Zn)	2020/12/09	<5.0		ug/L	
7097157	BAN	RPD	Total Aluminum (Al)	2020/12/09	NC		%	20
			Total Antimony (Sb)	2020/12/09	NC		%	20
			Total Arsenic (As)	2020/12/09	NC		%	20
			Total Barium (Ba)	2020/12/09	NC		%	20
			Total Beryllium (Be)	2020/12/09	NC		%	20
			Total Bismuth (Bi)	2020/12/09	NC		%	20
			Total Boron (B)	2020/12/09	NC		%	20
			Total Cadmium (Cd)	2020/12/09	NC		%	20
			Total Calcium (Ca)	2020/12/09	NC		%	20
			Total Chromium (Cr)	2020/12/09	NC		%	20
			Total Cobalt (Co)	2020/12/09	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Copper (Cu)	2020/12/09	NC		%	20
			Total Iron (Fe)	2020/12/09	NC		%	20
			Total Lead (Pb)	2020/12/09	NC		%	20
			Total Magnesium (Mg)	2020/12/09	NC		%	20
			Total Manganese (Mn)	2020/12/09	NC		%	20
			Total Molybdenum (Mo)	2020/12/09	NC		%	20
			Total Nickel (Ni)	2020/12/09	NC		%	20
			Total Phosphorus (P)	2020/12/09	NC		%	20
			Total Potassium (K)	2020/12/09	NC		%	20
			Total Selenium (Se)	2020/12/09	NC		%	20
			Total Silver (Ag)	2020/12/09	NC		%	20
			Total Sodium (Na)	2020/12/09	1.5		%	20
			Total Strontium (Sr)	2020/12/09	NC		%	20
			Total Thallium (Tl)	2020/12/09	NC		%	20
			Total Tin (Sn)	2020/12/09	NC		%	20
			Total Titanium (Ti)	2020/12/09	NC		%	20
			Total Uranium (U)	2020/12/09	NC		%	20
			Total Vanadium (V)	2020/12/09	NC		%	20
			Total Zinc (Zn)	2020/12/09	NC		%	20
7097272	YLG	Matrix Spike	Total Organic Carbon (C)	2020/12/10		108	%	85 - 115
7097272	YLG	Spiked Blank	Total Organic Carbon (C)	2020/12/10		107	%	80 - 120
7097272	YLG	Method Blank	Total Organic Carbon (C)	2020/12/10	<0.50		mg/L	
7097272	YLG	RPD	Total Organic Carbon (C)	2020/12/10	5.4		%	15
7097387	SHW	QC Standard	Turbidity	2020/12/08		102	%	80 - 120
7097387	SHW	Spiked Blank	Turbidity	2020/12/08		97	%	80 - 120
7097387	SHW	Method Blank	Turbidity	2020/12/08	<0.10		NTU	
7097387	SHW	RPD	Turbidity	2020/12/08	8.9		%	20
7097579	YLG	Matrix Spike	Total Organic Carbon (C)	2020/12/10		108	%	85 - 115
7097579	YLG	Spiked Blank	Total Organic Carbon (C)	2020/12/10		106	%	80 - 120
7097579	YLG	Method Blank	Total Organic Carbon (C)	2020/12/10	<0.50		mg/L	
7097579	YLG	RPD	Total Organic Carbon (C)	2020/12/10	NC		%	15
7097762	YLG	Matrix Spike	Total Organic Carbon (C)	2020/12/10		106	%	85 - 115
7097762	YLG	Spiked Blank	Total Organic Carbon (C)	2020/12/10		106	%	80 - 120
7097762	YLG	Method Blank	Total Organic Carbon (C)	2020/12/10	<0.50		mg/L	
7097762	YLG	RPD	Total Organic Carbon (C)	2020/12/10	NC		%	15
7099282	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2020/12/09		NC	%	80 - 120
7099282	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2020/12/09		104	%	80 - 120
7099282	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2020/12/09	<5.0		mg/L	
7099282	MCN	RPD	Total Alkalinity (Total as CaCO3)	2020/12/09	1.9		%	20
7099289	MCN	Matrix Spike	Dissolved Chloride (Cl-)	2020/12/09		NC	%	80 - 120
7099289	MCN	Spiked Blank	Dissolved Chloride (Cl-)	2020/12/09		99	%	80 - 120
7099289	MCN	Method Blank	Dissolved Chloride (Cl-)	2020/12/09	<1.0		mg/L	
7099289	MCN	RPD	Dissolved Chloride (Cl-)	2020/12/09	0.59		%	20
7099290	MCN	Matrix Spike	Dissolved Sulphate (SO4)	2020/12/10		NC	%	80 - 120
7099290	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2020/12/09		100	%	80 - 120
7099290	MCN	Method Blank	Dissolved Sulphate (SO4)	2020/12/09	<2.0		mg/L	
7099290	MCN	RPD	Dissolved Sulphate (SO4)	2020/12/10	6.1		%	20
7099292	MCN	Matrix Spike	Reactive Silica (SiO2)	2020/12/09		89	%	80 - 120
7099292	MCN	Spiked Blank	Reactive Silica (SiO2)	2020/12/09		93	%	80 - 120
7099292	MCN	Method Blank	Reactive Silica (SiO2)	2020/12/09	<0.50		mg/L	
7099292	MCN	RPD	Reactive Silica (SiO2)	2020/12/09	0.18		%	20
7099295	MCN	Spiked Blank	Colour	2020/12/09		102	%	80 - 120
7099295	MCN	Method Blank	Colour	2020/12/09	<5.0		TCU	
7099295	MCN	RPD	Colour	2020/12/09	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7099296	MCN	Matrix Spike	Orthophosphate (P)	2020/12/09		91	%	80 - 120
7099296	MCN	Spiked Blank	Orthophosphate (P)	2020/12/09		99	%	80 - 120
7099296	MCN	Method Blank	Orthophosphate (P)	2020/12/09	<0.010		mg/L	
7099296	MCN	RPD	Orthophosphate (P)	2020/12/09	NC		%	20
7099297	MCN	Matrix Spike	Nitrate + Nitrite (N)	2020/12/09		100	%	80 - 120
7099297	MCN	Spiked Blank	Nitrate + Nitrite (N)	2020/12/09		100	%	80 - 120
7099297	MCN	Method Blank	Nitrate + Nitrite (N)	2020/12/09	<0.050		mg/L	
7099297	MCN	RPD	Nitrate + Nitrite (N)	2020/12/09	5.9		%	20
7099299	MCN	Matrix Spike	Nitrite (N)	2020/12/09		105	%	80 - 120
7099299	MCN	Spiked Blank	Nitrite (N)	2020/12/09		106	%	80 - 120
7099299	MCN	Method Blank	Nitrite (N)	2020/12/09	<0.010		mg/L	
7099299	MCN	RPD	Nitrite (N)	2020/12/09	2.7		%	20
7099300	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2020/12/09		NC	%	80 - 120
7099300	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2020/12/09		102	%	80 - 120
7099300	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2020/12/09	<5.0		mg/L	
7099300	MCN	RPD	Total Alkalinity (Total as CaCO3)	2020/12/09	0.59		%	20
7099303	MCN	Matrix Spike	Dissolved Chloride (Cl-)	2020/12/09		95	%	80 - 120
7099303	MCN	Spiked Blank	Dissolved Chloride (Cl-)	2020/12/09		101	%	80 - 120
7099303	MCN	Method Blank	Dissolved Chloride (Cl-)	2020/12/09	<1.0		mg/L	
7099303	MCN	RPD	Dissolved Chloride (Cl-)	2020/12/09	0.85		%	20
7099304	MCN	Matrix Spike	Dissolved Sulphate (SO4)	2020/12/09		NC	%	80 - 120
7099304	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2020/12/09		101	%	80 - 120
7099304	MCN	Method Blank	Dissolved Sulphate (SO4)	2020/12/10	<2.0		mg/L	
7099304	MCN	RPD	Dissolved Sulphate (SO4)	2020/12/09	0.12		%	20
7099306	MCN	Matrix Spike	Reactive Silica (SiO2)	2020/12/09		86	%	80 - 120
7099306	MCN	Spiked Blank	Reactive Silica (SiO2)	2020/12/09		93	%	80 - 120
7099306	MCN	Method Blank	Reactive Silica (SiO2)	2020/12/10	<0.50		mg/L	
7099306	MCN	RPD	Reactive Silica (SiO2)	2020/12/09	2.8		%	20
7099308	MCN	Spiked Blank	Colour	2020/12/09		99	%	80 - 120
7099308	MCN	Method Blank	Colour	2020/12/09	<5.0		TCU	
7099308	MCN	RPD	Colour	2020/12/09	NC		%	20
7099314	MCN	Matrix Spike	Orthophosphate (P)	2020/12/09		94	%	80 - 120
7099314	MCN	Spiked Blank	Orthophosphate (P)	2020/12/09		93	%	80 - 120
7099314	MCN	Method Blank	Orthophosphate (P)	2020/12/09	<0.010		mg/L	
7099314	MCN	RPD	Orthophosphate (P)	2020/12/09	2.0		%	20
7099317	MCN	Matrix Spike	Nitrate + Nitrite (N)	2020/12/09		NC	%	80 - 120
7099317	MCN	Spiked Blank	Nitrate + Nitrite (N)	2020/12/09		99	%	80 - 120
7099317	MCN	Method Blank	Nitrate + Nitrite (N)	2020/12/09	<0.050		mg/L	
7099317	MCN	RPD	Nitrate + Nitrite (N)	2020/12/09	9.5		%	20
7099320	MCN	Matrix Spike	Nitrite (N)	2020/12/09		104	%	80 - 120
7099320	MCN	Spiked Blank	Nitrite (N)	2020/12/09		108	%	80 - 120
7099320	MCN	Method Blank	Nitrite (N)	2020/12/09	<0.010		mg/L	
7099320	MCN	RPD	Nitrite (N)	2020/12/09	14		%	20
7099324	SHW	Spiked Blank	Conductivity	2020/12/09		98	%	80 - 120
7099324	SHW	Method Blank	Conductivity	2020/12/09	1.0, RDL=1.0		uS/cm	
7099324	SHW	RPD	Conductivity	2020/12/09	0.38		%	10
7099326	SHW	Spiked Blank	pH	2020/12/09		100	%	97 - 103
7099326	SHW	RPD	pH	2020/12/09	1.6		%	N/A
7099382	SHW	Spiked Blank	Conductivity	2020/12/09		102	%	80 - 120
7099382	SHW	Method Blank	Conductivity	2020/12/09	1.0, RDL=1.0		uS/cm	
7099382	SHW	RPD	Conductivity	2020/12/09	0.40		%	10
7099386	SHW	Spiked Blank	pH	2020/12/09		100	%	97 - 103

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7099386	SHW	RPD	pH	2020/12/09	1.9		%	N/A
7102189	YLG	Matrix Spike	Total Organic Carbon (C)	2020/12/11		110	%	85 - 115
7102189	YLG	Spiked Blank	Total Organic Carbon (C)	2020/12/11		106	%	80 - 120
7102189	YLG	Method Blank	Total Organic Carbon (C)	2020/12/11	<0.50		mg/L	
7102189	YLG	RPD	Total Organic Carbon (C)	2020/12/11	0.14		%	15

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Alan Stewart, Organics Manager, Bedford

Mike MacGillivray, Scientific Specialist (Inorganics)

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Appendix D

Mann-Kendall Tables

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000012	0.000016	0.000019	0.000017	0.000014	0.000033	0.000011	0.000005	0.000019	0.000014	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		1	1	1	1	1	-1	-1	1	1	5
Row 2: Compare to Event 2:			1	1	-1	1	-1	-1	1	-1	0
Row 3: Compare to Event 3:				-1	-1	1	-1	-1	0	-1	-4
Row 4: Compare to Event 4:					-1	1	-1	-1	1	-1	-2
Row 5: Compare to Event 5:						1	-1	-1	1	0	0
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								-1	1	1	1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-3**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							X
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000018	0.000005	0.000011	0.000005	0.000017	0.000005	0.000015	0.000014	0.000026	0.000011	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	1	-1	-7
Row 2: Compare to Event 2:			1	0	1	0	1	1	1	1	6
Row 3: Compare to Event 3:				-1	1	-1	1	1	1	0	2
Row 4: Compare to Event 4:					1	0	1	1	1	1	5
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							X
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.13	0.32	0.14	0.16	0.11	0.34	0.13	0.077	0.078	0.099	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		1	1	1	-1	1	0	-1	-1	-1	0
Row 2: Compare to Event 2:			-1	-1	-1	1	-1	-1	-1	-1	-6
Row 3: Compare to Event 3:				1	-1	1	-1	-1	-1	-1	-3
Row 4: Compare to Event 4:					-1	1	-1	-1	-1	-1	-4
Row 5: Compare to Event 5:						1	1	-1	-1	-1	-1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-18**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							X
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	26	16	24	10	23	12	24	32	35	28	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	1	1	1	-3
Row 2: Compare to Event 2:			1	-1	1	-1	1	1	1	1	4
Row 3: Compare to Event 3:				-1	-1	-1	0	1	1	1	0
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	1	1	1	1	3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								1	1	1	3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **16**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							X
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
X	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.006	0.009	0.0061	0.0025	0.0025	0.0025	0.0025	0.0055	0.012	0.0065	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		1	1	-1	-1	-1	-1	-1	1	1	-1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	1	-1	-6
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	1	-3
Row 4: Compare to Event 4:					0	0	0	1	1	1	3
Row 5: Compare to Event 5:						0	0	1	1	1	3
Row 6: Compare to Event 6:							0	1	1	1	3
Row 7: Compare to Event 7:								1	1	1	3
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **3**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							X
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000037	0.000021	0.00001	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-24**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						X
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.00014	0.000005	0.000027	0.000005	0.00001	0.000005	0.000005	0.000005	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	0	1	0	0	0	0	0	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	0	0	0	0	0	1
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-18**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							X
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000068	0.000005	0.000011	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	21-Jul-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	0	0	0	0	0	0	0	1
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-15**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							X
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.00014	0.000016	0.000025	0.000016	0.000012	0.000015	0.000018	0.00002	0.000011	0.000011	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	07-25-18	11-23-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	0	-1	-1	1	1	-1	-1	-1
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					-1	-1	1	1	-1	-1	-2
Row 5: Compare to Event 5:						1	1	1	-1	-1	1
Row 6: Compare to Event 6:							1	1	-1	-1	0
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = -21

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							X
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	NRC-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.036	0.052	0.034	0.031	0.06	0.035	0.055	0.034	0.06	0.047	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	-1	-1	1	-1	1	-1	1	1	1
Row 2: Compare to Event 2:			-1	-1	1	-1	1	-1	1	-1	-2
Row 3: Compare to Event 3:				-1	1	1	1	0	1	1	4
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	-1	-1	0	-1	-4
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	NRC-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	15	15	16	21	12	17	15	18	11	27	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	1	1	-1	1	0	1	-1	1	3
Row 2: Compare to Event 2:			1	1	-1	1	0	1	-1	1	3
Row 3: Compare to Event 3:				1	-1	1	-1	1	-1	1	1
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	1	-4
Row 5: Compare to Event 5:						1	1	1	-1	1	3
Row 6: Compare to Event 6:							-1	1	-1	1	0
Row 7: Compare to Event 7:								1	-1	1	1
Row 8: Compare to Event 8:									-1	1	0
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **8**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							X
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	NRC-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.027	0.0025	0.0025	0.0025	0.0025	0.0067	0.0025	0.0051	0.0025	0.0025	
	18-Nov-15	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			0	0	0	1	0	1	0	0	2
Row 3: Compare to Event 3:				0	0	1	0	1	0	0	2
Row 4: Compare to Event 4:					0	1	0	1	0	0	2
Row 5: Compare to Event 5:						1	0	1	0	0	2
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000005	0.000011	0.000005	0.000035	0.00006	0.000011	0.000014	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	1	0	1	1	1	1	0	0	5
Row 2: Compare to Event 2:			1	0	1	1	1	1	0	0	5
Row 3: Compare to Event 3:				-1	1	1	0	1	-1	-1	0
Row 4: Compare to Event 4:					1	1	1	1	0	0	4
Row 5: Compare to Event 5:						1	-1	-1	-1	-1	-3
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000016	0.000034	0.000005	0.000005	0.000005	0.000005	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	1	1	0	0	0	0	2
Row 2: Compare to Event 2:			0	0	1	1	0	0	0	0	2
Row 3: Compare to Event 3:				0	1	1	0	0	0	0	2
Row 4: Compare to Event 4:					1	1	0	0	0	0	2
Row 5: Compare to Event 5:						1	-1	-1	-1	-1	-3
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.057	0.091	0.054	0.13	0.05	0.12	0.074	0.074	0.21	0.025	
	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	1-Dec-20	
Row 1: Compare to Event 1:		1	-1	1	-1	1	1	1	1	-1	3
Row 2: Compare to Event 2:			-1	1	-1	1	-1	-1	1	-1	-2
Row 3: Compare to Event 3:				1	-1	1	1	1	1	-1	3
Row 4: Compare to Event 4:					-1	-1	-1	-1	1	-1	-4
Row 5: Compare to Event 5:						1	1	1	1	-1	3
Row 6: Compare to Event 6:							-1	-1	1	-1	-2
Row 7: Compare to Event 7:								0	1	-1	0
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000023	0.000018	0.000039	0.000005	0.000017	0.00026	0.000027	0.000034	0.000019	0.000017	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	-1	1	1	1	-1	-1	-1
Row 2: Compare to Event 2:			1	-1	-1	1	1	1	1	-1	2
Row 3: Compare to Event 3:				-1	-1	1	-1	-1	-1	-1	-5
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						1	1	1	1	0	4
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.15	0.17	0.14	0.19	0.35	0.18	0.13	0.13	0.2	0.15	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	-1	1	1	1	-1	-1	1	0	2
Row 2: Compare to Event 2:			-1	1	1	1	-1	-1	1	-1	0
Row 3: Compare to Event 3:				1	1	1	-1	-1	1	1	3
Row 4: Compare to Event 4:					1	-1	-1	-1	1	-1	-2
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							-1	-1	1	-1	-2
Row 7: Compare to Event 7:								0	1	1	2
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	43	51	42	54	290	43	46	47	98	43	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	-1	1	1	0	1	1	1	0	5
Row 2: Compare to Event 2:			-1	1	1	-1	-1	-1	1	-1	-2
Row 3: Compare to Event 3:				1	1	1	1	1	1	1	7
Row 4: Compare to Event 4:					1	-1	-1	-1	1	-1	-2
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							1	1	1	0	3
Row 7: Compare to Event 7:								1	1	-1	1
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0057	0.0025	0.0062	0.047	0.0062	0.0073	0.0025	0.0025	
	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	1	0	1	1	1	1	0	0	5
Row 2: Compare to Event 2:			1	0	1	1	1	1	0	0	5
Row 3: Compare to Event 3:				-1	1	1	1	1	-1	-1	1
Row 4: Compare to Event 4:					1	1	1	1	0	0	4
Row 5: Compare to Event 5:						1	0	1	-1	-1	0
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **8**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							X
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

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NS Lands
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0					X		
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.00001	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	0	0	-6
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5					X		
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0					X		
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.415	0.025	0.025	0.085	0.058	0.025	0.053	0.057			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	0	0	-7
Row 2: Compare to Event 2:			0	1	1	0	1	1	0	0	4
Row 3: Compare to Event 3:				1	1	0	1	1	0	0	4
Row 4: Compare to Event 4:					-1	-1	-1	-1	0	0	-4
Row 5: Compare to Event 5:						-1	-1	-1	0	0	-3
Row 6: Compare to Event 6:							1	1	0	0	2
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-3**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3					X		
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000015	0.000005	0.000005	0.000005	0.000058	0.000005	0.000005	0.000005			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		-1	-1	-1	1	-1	-1	-1	0	0	-5
Row 2: Compare to Event 2:			0	0	1	0	0	0	0	0	1
Row 3: Compare to Event 3:				0	1	0	0	0	0	0	1
Row 4: Compare to Event 4:					1	0	0	0	0	0	1
Row 5: Compare to Event 5:						-1	-1	-1	0	0	-3
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-5**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5					X		
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.671	0.26	0.26	0.25	0.27	0.21	0.24	0.25			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	0	0	-7
Row 2: Compare to Event 2:			0	-1	1	-1	-1	-1	0	0	-3
Row 3: Compare to Event 3:				-1	1	-1	-1	-1	0	0	-3
Row 4: Compare to Event 4:					1	-1	-1	0	0	0	-1
Row 5: Compare to Event 5:						-1	-1	-1	0	0	-3
Row 6: Compare to Event 6:							1	1	0	0	2
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = -14

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14					X		
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	740	160	170	150	100	110	100	120			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	0	0	-7
Row 2: Compare to Event 2:			1	-1	-1	-1	-1	-1	0	0	-4
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	0	0	-5
Row 4: Compare to Event 4:					-1	-1	-1	-1	0	0	-4
Row 5: Compare to Event 5:						1	0	1	0	0	2
Row 6: Compare to Event 6:							-1	1	0	0	0
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-17**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17					X		
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.014	0.0025	0.0025	0.0025			
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19			
Row 1: Compare to Event 1:		0	0	0	1	0	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	1	0	0	0	0	0	1
Row 3: Compare to Event 3:				0	1	0	0	0	0	0	1
Row 4: Compare to Event 4:					1	0	0	0	0	0	1
Row 5: Compare to Event 5:						-1	-1	-1	0	0	-3
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1					X		
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005				
	11-18-15	16-Aug-12	12-18-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0				X			
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005				
	11-18-15	16-Aug-12	12-18-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0				X			
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005				
	11-18-15	16-Aug-12	12-18-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0				X			
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.54	0.025	0.025	0.067	0.066	0.052				
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		1	0	0	1	1	1	0	0	0	4
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	0	0	0	-5
Row 3: Compare to Event 3:				0	1	1	1	0	0	0	3
Row 4: Compare to Event 4:					1	1	1	0	0	0	3
Row 5: Compare to Event 5:						-1	-1	0	0	0	-2
Row 6: Compare to Event 6:							-1	0	0	0	-1
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2				X			
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000005	0.000027	0.000005	0.000005	0.000005	0.000005	0.000005				
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	0	0	0	-5
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4				X			
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.25	0.48	0.19	0.2	0.2	0.24	0.22				
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		1	-1	-1	-1	-1	-1	0	0	0	-4
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	0	0	0	-5
Row 3: Compare to Event 3:				1	1	1	1	0	0	0	4
Row 4: Compare to Event 4:					0	1	1	0	0	0	2
Row 5: Compare to Event 5:						1	1	0	0	0	2
Row 6: Compare to Event 6:							-1	0	0	0	-1
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2				X			
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	190	440	120	110	120	140	150				
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		1	-1	-1	-1	-1	-1	0	0	0	-4
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	0	0	0	-5
Row 3: Compare to Event 3:				-1	0	1	1	0	0	0	1
Row 4: Compare to Event 4:					1	1	1	0	0	0	3
Row 5: Compare to Event 5:						1	1	0	0	0	2
Row 6: Compare to Event 6:							1	0	0	0	1
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2				X			
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025				
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20				
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0				X			
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000013	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.00004	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000028	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.063	0.025	0.057	0.025	0.025	0.025	0.054	0.025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	1	0	1	0	0	0	1	0	3
Row 2: Compare to Event 2:			1	0	1	0	0	0	1	0	3
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	0	0	0	1	0	2
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							0	0	1	0	1
Row 7: Compare to Event 7:								0	1	0	1
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000005	0.000014	0.000011	0.00001	0.000005	0.000014	0.000005	0.000015	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	1	1	0	1	0	1	0	0	5
Row 2: Compare to Event 2:			-1	-1	-1	0	-1	1	-1	-1	-5
Row 3: Compare to Event 3:				-1	-1	1	-1	1	-1	-1	-3
Row 4: Compare to Event 4:					-1	1	-1	1	-1	-1	-2
Row 5: Compare to Event 5:						1	0	1	0	0	2
Row 6: Compare to Event 6:							-1	1	-1	-1	-2
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.28	0.11	0.45	0.11	0.43	0.13	0.23	0.11	0.34	0.17	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	-1	-1	1	-1	-3
Row 2: Compare to Event 2:			1	0	1	1	1	0	1	1	6
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	0	1	1	5
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-4-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	74	39	110	42	100	41	69	43	99	57	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	-1	-1	1	-1	-3
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0051	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	1	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			0	1	0	0	0	0	0	0	1
Row 3: Compare to Event 3:				1	0	0	0	0	0	0	1
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-3**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							X
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-6-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.00001	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-6-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000038	0.000017	0.000012	0.000005	0.00001	0.000005	0.000015	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	1	1	0	1	0	1	0	0	5
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					-1	-1	-1	1	-1	-1	-4
Row 5: Compare to Event 5:						1	0	1	0	0	2
Row 6: Compare to Event 6:							-1	1	-1	-1	-2
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-15**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							X
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-6-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000027	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	-1	-1	-8
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.059	0.025	0.062	0.025	0.025	0.025	0.081	0.025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	1	0	1	0	0	0	1	0	3
Row 2: Compare to Event 2:			1	0	1	0	0	0	1	0	3
Row 3: Compare to Event 3:				-1	1	-1	-1	-1	1	-1	-3
Row 4: Compare to Event 4:					1	0	0	0	1	0	2
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							0	0	1	0	1
Row 7: Compare to Event 7:								0	1	0	1
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-6-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000005	0.000015	0.000011	0.00001	0.000005	0.000015	0.000005	0.000014	0.000016	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	1	1	0	1	0	1	1	0	6
Row 2: Compare to Event 2:			-1	-1	-1	0	-1	-1	1	-1	-5
Row 3: Compare to Event 3:				-1	-1	1	-1	1	1	-1	-1
Row 4: Compare to Event 4:					-1	1	-1	1	1	-1	0
Row 5: Compare to Event 5:						1	0	1	1	0	3
Row 6: Compare to Event 6:							-1	-1	1	-1	-2
Row 7: Compare to Event 7:								1	1	0	2
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.3	0.16	0.5	0.16	0.35	0.14	0.3	0.15	0.43	0.18	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	0	-1	1	-1	-2
Row 2: Compare to Event 2:			1	0	1	-1	1	-1	1	1	3
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	-1	1	-1	1	1	2
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-3**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							X
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	64	41	110	48	95	45	76	49	110	54	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	1	-1	1	-1	-1
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	0	-1	-6
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-6-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.0025	0.0064	0.0025	0.0025	0.0025	0.0025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	1	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	0	1	0	0	0	0	1
Row 3: Compare to Event 3:				0	0	1	0	0	0	0	1
Row 4: Compare to Event 4:					0	1	0	0	0	0	1
Row 5: Compare to Event 5:						1	0	0	0	0	1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events: 4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: WB-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.00097	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	1	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	0	1	0	0	0	0	1
Row 3: Compare to Event 3:				0	0	1	0	0	0	0	1
Row 4: Compare to Event 4:					0	1	0	0	0	0	1
Row 5: Compare to Event 5:						1	0	0	0	0	1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000092	0.000005	0.000027	0.000005	0.000005	0.0025	0.000005	0.000005	0.000012	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	1	-1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	0	0	1	0	0	1	0	3
Row 3: Compare to Event 3:				-1	-1	1	-1	-1	-1	-1	-5
Row 4: Compare to Event 4:					0	1	0	0	1	0	2
Row 5: Compare to Event 5:						1	0	0	1	0	2
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	1	0	1
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-8**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							X
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: WB-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000025	0.000005	0.000005	0.000005	0.000005	0.0013	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	1	-1	-1	-1	-1	-7
Row 2: Compare to Event 2:			0	0	0	1	0	0	0	0	1
Row 3: Compare to Event 3:				0	0	1	0	0	0	0	1
Row 4: Compare to Event 4:					0	1	0	0	0	0	1
Row 5: Compare to Event 5:						1	0	0	0	0	1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: WB-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.69	0.025	0.43	0.025	0.11	0.025	0.025	0.025	0.55	0.025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	0	1	0	0	0	1	0	3
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	-1	-5
Row 4: Compare to Event 4:					1	0	0	0	1	0	2
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							0	0	1	0	1
Row 7: Compare to Event 7:								0	1	0	1
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = -10

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							X
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000035	0.000026	0.000027	0.000027	0.000024	0.00015	0.000021	0.000027	0.000087	0.000027	
	22-Jul-16	8-Dec-16	3-Aug-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-09	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	1	-1	-1	1	-1	-5
Row 2: Compare to Event 2:			1	1	-1	1	-1	1	1	1	4
Row 3: Compare to Event 3:				0	-1	1	-1	0	1	0	0
Row 4: Compare to Event 4:					-1	1	-1	0	1	0	0
Row 5: Compare to Event 5:						1	-1	1	1	1	3
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	1	1	3
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	1.3	0.061	0.94	0.049	0.32	0.05	0.12	0.039	1.2	0.058	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	-1	0
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	-1	-5
Row 4: Compare to Event 4:					1	1	1	-1	1	1	4
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-11**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							X
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	410	8.5	230	8	71	6.5	16	6.6	330	7.5	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	-1	0
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	-1	-5
Row 4: Compare to Event 4:					1	-1	1	-1	1	-1	0
Row 5: Compare to Event 5:						-1	-1	-1	1	-1	-3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-13**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							X
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: WB-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.011	0.0025	0.0025	0.0025	0.006	0.16	0.0025	0.005	0.0069	0.0025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	-1	-1	-1	1	-1	-1	-1	-1	-7
Row 2: Compare to Event 2:			0	0	1	1	0	1	1	0	4
Row 3: Compare to Event 3:				0	1	1	0	1	1	0	4
Row 4: Compare to Event 4:					1	1	0	1	1	0	4
Row 5: Compare to Event 5:						1	-1	-1	1	-1	-1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	1	0	2
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000011	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	1	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	0	1	0	0	0	0	1
Row 3: Compare to Event 3:				0	0	1	0	0	0	0	1
Row 4: Compare to Event 4:					0	1	0	0	0	0	1
Row 5: Compare to Event 5:						1	0	0	0	0	1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000016	0.000005	0.000018	0.000005	0.000031	0.000005	0.000025	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	1	0	1	0	1	0	0	4
Row 2: Compare to Event 2:			-1	1	-1	1	-1	1	-1	-1	-2
Row 3: Compare to Event 3:				1	0	1	0	1	0	0	3
Row 4: Compare to Event 4:					-1	1	-1	1	-1	-1	-2
Row 5: Compare to Event 5:						1	0	1	0	0	2
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	3.6	0.52	3.6	0.34	3.5	0.42	3.1	0.36	3.2	3.6	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	0	-1	-1	-1	-1	-1	-1	0	-7
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	0	-6
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	-1	-1	-1	1	-3
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	1	1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
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MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.00005	0.000025	0.00005	0.00002	0.00005	0.000024	0.00005	0.000021	0.00011	0.00005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	-1	1	0	-3
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	0	-1	0	-1	1	0	-2
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	0	-1	1	0	-1
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	0	0
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							X
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	5.5	1	6.1	0.63	5.9	0.73	5	0.34	5.5	5.6	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	-1	-1	0	1	-2
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	-1	1	1	4
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	1	1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	1600	290	2000	210	1900	250	1700	250	2100	2100	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	1	-1	1	1	1
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	1	-3
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	-1	-1	1	1	-1
Row 6: Compare to Event 6:							1	0	1	1	3
Row 7: Compare to Event 7:								-1	1	1	1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **11**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							X
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: BP-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.025	0.0025	0.025	0.0025	0.025	0.0025	0.025	0.0025	0.025	0.025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	-1	0	0	-4
Row 2: Compare to Event 2:			1	0	1	0	1	0	1	1	5
Row 3: Compare to Event 3:				-1	0	-1	0	-1	0	0	-3
Row 4: Compare to Event 4:					1	0	1	0	1	1	4
Row 5: Compare to Event 5:						-1	0	-1	0	0	-2
Row 6: Compare to Event 6:							1	0	1	1	3
Row 7: Compare to Event 7:								-1	0	0	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.00011	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	1	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	0	1	0	0	0	0	1
Row 3: Compare to Event 3:				0	0	1	0	0	0	0	1
Row 4: Compare to Event 4:					0	1	0	0	0	0	1
Row 5: Compare to Event 5:						1	0	0	0	0	1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000016	0.000005	0.000018	0.00013	0.000035	0.000029	0.000019	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		1	0	1	1	1	1	1	0	0	6
Row 2: Compare to Event 2:			-1	1	1	1	1	1	-1	-1	2
Row 3: Compare to Event 3:				1	1	1	1	1	0	0	5
Row 4: Compare to Event 4:					1	1	1	1	-1	-1	2
Row 5: Compare to Event 5:						-1	-1	-1	-1	-1	-5
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	3.5	0.46	3.6	0.21	2.8	0.26	3	0.18	3.2	2.6	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	-1	-1	-1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	-1	1	1	4
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.00005	0.000029	0.00005	0.000018	0.00005	0.000021	0.00005	0.000021	0.00013	0.00005	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	-1	1	0	-3
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	0	-1	0	-1	1	0	-2
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	0	-1	1	0	-1
Row 6: Compare to Event 6:							1	0	1	1	3
Row 7: Compare to Event 7:								-1	1	0	0
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **6**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	5.4	0.89	6.1	0.45	5	0.5	5	0.66	5.6	4.5	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	-1	-1	-1	-1	1	-1	-5
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	0	-1	1	-1	-2
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	1400	270	2000	150	1700	180	1700	120	2100	1700	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	1	-1	1	-1	1	-1	1	1	1
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	-1	-5
Row 4: Compare to Event 4:					1	1	1	-1	1	1	4
Row 5: Compare to Event 5:						-1	0	-1	1	0	-1
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	1	0	0
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **4**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.025	0.015	0.025	0.0058	0.025	0.0088	0.025	0.0072	0.025	0.025	
	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	-1	0	0	-4
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	1	2
Row 3: Compare to Event 3:				-1	0	-1	0	-1	0	0	-3
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	0	-1	0	0	-2
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	0	0	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume