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Item No. 2
North West Community Council
July 17, 2017

TO: Chair and Members of North West Community Council

Original Signed

SUBMITTED BY:

Bob Bjerke, Director and Chief Planner, Planning & Development

DATE: May 30, 2017

SUBJECT: **Bedford West Water Quality Status Update**

INFORMATION REPORT

ORIGIN

Bedford Municipal Planning Strategy, Bedford West Secondary Planning Strategy, Policies BW-3, BW-4, and BW-5.

Development Agreements between Halifax Regional Municipality and West Bedford Holdings Ltd, and between Halifax Regional Municipality and Cresco Ltd.

LEGISLATIVE AUTHORITY

The Halifax Regional Municipality Charter, Part VIII, Planning and Development, Section 240, Development Agreements.

BACKGROUND

The Bedford West Secondary Planning Strategy, Policy BW-3, requires that a water quality monitoring program be undertaken for the Paper Mill Lake watershed to track the eutrophication process. Eutrophication is the process by which lakes naturally accumulate nutrients and biological material. This process is typically accelerated through the impacts of human activities, resulting in relatively rapid changes in trophic state, from lower states (fewer nutrients) to higher states (more nutrients), with corresponding changes in appearance, functional uses, and amenity values. The program was specified in the Planning Strategy in response to the Municipality's stated desire to "stem the decline of lakes from the accelerated process of eutrophication, and sedimentation and inputs from other urban runoff", as published in the former Regional Municipal Planning Strategy.[1]

The terms of the monitoring program are specified within Development Agreements that have been negotiated in consultation with the Bedford Watershed Advisory Board1[2] until its dissolution in 2013, and the Regional Watersheds Advisory Board since 2013. All such agreements have identified the value of 10 micrograms per Litre (µg/L) of Total Phosphorus as a "trigger value", representing the transition point between the second-lowest trophic state (oligotrophic) to the next-highest trophic state (mesotrophic) per Environment Canada criteria (see Table 1).

Trophic Status	**TP (µg/L)**
Ultra-oligotrophic	< 4
Oligotrophic	4-10
Mesotrophic	10-20
Meso-eutrophic	20-35
Eutrophic	35-100
Hypereutrophic	> 100

Table 1. Summary of Canadian trophic state trigger ranges. From Environment Canada (2004).

The municipality is required to submit test results to the Developer, the Community Council, and BWAB (now RWAB) within three months of being received from the consultant, or immediately, if total phosphorus ("TP") or bacterial results exceed management thresholds identified therein. Furthermore, in spring 2015, staff reviewed historic contractor reports submitted from spring 2012 through fall 2014 and realized that a high proportion of water quality samples had TP results exceeding the trigger value of 10µg/L. This trend consequently initiated a three-phase assessment process to better understand the TP occurrences and to help devise a future approach to watershed management as follows:

Phase 1:
Report and discuss the TP exceedance findings with the developer and conduct a detailed assessment of existing water quality data from the Paper Mill Lake watershed to identify trends in Total Phosphorus measurements, considering CCME Guidelines.

Phase 2:
Investigate cause(s) of high TP measurements, considering all significant land uses and activities that have occurred in the Paper Mill Lake watershed since the inception of the monitoring program.

Phase 3:
Determine a course of action respecting watershed management and future land use development in the area.

[1] The current Regional Municipal Planning Strategy states this objective as follows: "This Plan will seek to … maintain the existing trophic status of our lakes and waterways to the extent possible".
[2] RWAB assumed the functions previously performed by BWAB respecting Bedford West SPS once it began conducting meetings in July 2013.

DISCUSSION

This report presents an update to Council on the status of the assessment process regarding TP and water quality monitoring for Bedford West and the findings of the October 2016 monitoring event. Phase 1 (conduct detailed assessment of existing water quality data from the Paper Mill Lake watershed) was initiated in June 2015 and concluded in October of that year. The results of that phase were presented to NWCC in October 2015. Phase 2 (investigate cause(s) of high Total Phosphorus measurements) concluded in October 2016, with a presentation by Dalhousie University's Centre for Water Resource Studies delivered to NWCC in November 2016 and a staff report presented in January 2017.

October TP Monitoring Event Summary

The monitoring event held October 2016 found that total phosphorus concentrations exceeded the trigger value of 10 micrograms per Litre (10ug/L) at five of eleven stations monitored in October 2016. Staff will aim to submit any future reports of TP exceedance to Council more promptly.

A summary of TP results observed at all stations during the October 2016 monitoring event is presented below in Table 2. These results only represent water quality at the time that the samples were collected, and as such have little significance on their own. Their value may be realized in the determination of whether water quality is trending towards a mesotrophic (or higher) trophic state, and in indicating possible sources of excess nutrient contributions.

Sample Station	Concentration (µg/L)	Exceedance
KL1	8	No
KL2	13	Yes
KL3	4	No
KL4	7	No
KL5	3	No
HWY 102-1	9	No
HWY 102-2	12	Yes
LSD	12	Yes
LU	12	Yes
PML1	13	Yes
PML2	5	No

Table 2. Summary of TP results and exceedances October 2016.

As noted in Table 2, five stations exceeded the TP trigger value. Although applicable Development Agreements allow the Municipality to require follow-up testing to confirm these results, this option was not selected due to the assessment process currently underway based on previous TP results exceeding the 10µg/L trigger value (Table 3).

Sites	2012 Spring	2012 Summer	2012 Fall	2013 Spring	2013 Summer	2013 Fall	2014 Spring	2014 Summer	2014 Fall	# Exceedances 2013-2014	% Exceedances 2012-2014
KL1	0.037	0.043	0.007	0.007	0.011	0.008	0.011	0.026	0.013	6	66.67%
KL2	0.021	0.059	0.013	0.010	0.020	0.029	0.013	0.039	0.025	8	88.89%
KL3	0.019	0.045	0.007	0.006	0.006	0.012	0.009	0.023	0.148	5	55.56%
KL4	0.022	0.043	0.007	0.006	2.390	0.016	0.022	0.031	0.015	5	55.56%
KL5	0.018	0.040	0.006	0.005	0.013	0.010	0.010	0.026	0.135	5	55.56%
HWY102-1	0.019	0.039	0.020	0.006	0.021	0.022	0.013	0.038	0.031	8	88.89%
HWY102-2	0.021	0.054	0.030	0.014	0.028	0.199	0.028	--	0.201	8	100.00%
LSD	0.022	0.063	0.003	0.007	0.015	0.078	0.100	--	0.031	6	75.00%
LU	0.043	0.036	0.030	0.006	0.027	0.046	0.260	0.028	0.039	8	88.89%
PML1	0.019	--	0.030	0.006	0.007	0.047	0.012	0.030	0.021	6	75.00%
PML2	0.025	--	--	0.006	--	0.026	0.011	0.026	0.018	5	83.33%
									Overall	**70**	**75.27%**

Table 3. Summary of Total Phosphorus results and exceedances from Spring 2012 through Fall 2014

Next Steps

Phase 3, determining a course of action respecting watershed management and future land use development in the area, is now underway. This work is being performed within the context of a targeted watershed management and water quality program review, a key deliverable of Planning and Development's approved 2017/18 Business Plan. The review will consider what role lake-based water quality monitoring can play in providing decision-making support for land subdivision and development and the Municipality's role in monitoring watershed conditions through water quality monitoring.

FINANCIAL IMPLICATIONS

There are no financial implications for this report.

COMMUNITY ENGAGEMENT

No community engagement was required for this report.

ATTACHMENTS

Attachment A. Bedford West Water Quality Report October 2016.

A copy of this report can be obtained online at http://www.halifax.ca/commcoun/index.php then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

Report Prepared by: Cameron Deacoff, Environmental Performance Officer, 902.490.1926

Original Signed

Report Approved by: _____

Holly Richardson, Acting Program Manager, Energy & Environment, 902.490.3665

SNC·LAVALIN

Water Quality Monitoring Program
Bedford West, Bedford, NS

Fall 2016 Sampling Event

01 | 04 | 2017 Final Report

Water Quality Monitoring - Fall 2016

Rev. C01 > SLI ref. 631477-0001-T-4E-REP-000-0006

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SNC·LAVALIN

January 4, 2017

Halifax Regional Municipality
Energy and Environment
PO Box 1749
Halifax, Nova Scotia
B3J 3A5

Attention: Mr. Cameron Deacoff

Dear Mr. Deacoff:

RE: Final Report: Water Quality Monitoring Program, Fall 2016 Sampling Event Bedford West, Bedford, Nova Scotia

SNC-Lavalin Inc. (SLI) is pleased to submit one electronic copy of the final report presenting the results of the fall 2016 surface water quality sampling event for the Bedford West Water Quality Monitoring Program in Bedford, Nova Scotia.

If you have any questions or require clarification, please contact the undersigned at 902-492-4544.

Yours truly,

SNC♦LAVALIN INC.

Original Signed

Crysta Cumming, P. Eng
Environmental Department Manager

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EXECUTIVE SUMMARY

On October 25 and 26, 2016 SNC-Lavalin Inc. (SNCL) completed the Bedford West fall 2016 water quality monitoring sampling event on behalf of Halifax Regional Municipality (HRM). The sampling program consisted of collecting surface water samples from eleven (11) water quality sampling stations. Field parameters were recorded and samples collected for laboratory analyses. Based on HRM sampling schedule and analysis, the laboratory analysis included:

- Inorganics;
- Calculated Parameters;
- Standard Elements/Metals; and
- Microbiological analysis.

Applicable water quality criteria included:

- Canadian Council of Ministers of the Environment (CCME) guidelines for the Protection of Aquatic Life – Freshwater (PAL-F);
- Health Canada guidelines for Canadian Recreational Water Quality (2012, Third Edition); and
- Nova Scotia Environment (NSE) Environmental Quality Standards (EQS) for Surface Water, EQS for Contaminated Sites (NSE 2014) Table A2, Reference for Pathway Specific Standards for Surface Water – Fresh Water.

During the fall 2016 water quality monitoring event, the following four (4) parameters exceeded the recommended water quality criteria. Detailed information including station ID(s) and analytical results are outlined in the report:

1. Total Phosphorous (1m depth)
2. Dissolved Oxygen
3. pH (in Situ and Lab)
4. Metals (Total Iron and Total Zinc)

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Appendices

1 INTRODUCTION AND BACKGROUND

SNC-Lavalin Inc. (SNCL) has prepared this report to provide Halifax Regional Municipality (HRM) with water quality data for eleven (11) surface water stations throughout the Bedford West development area.

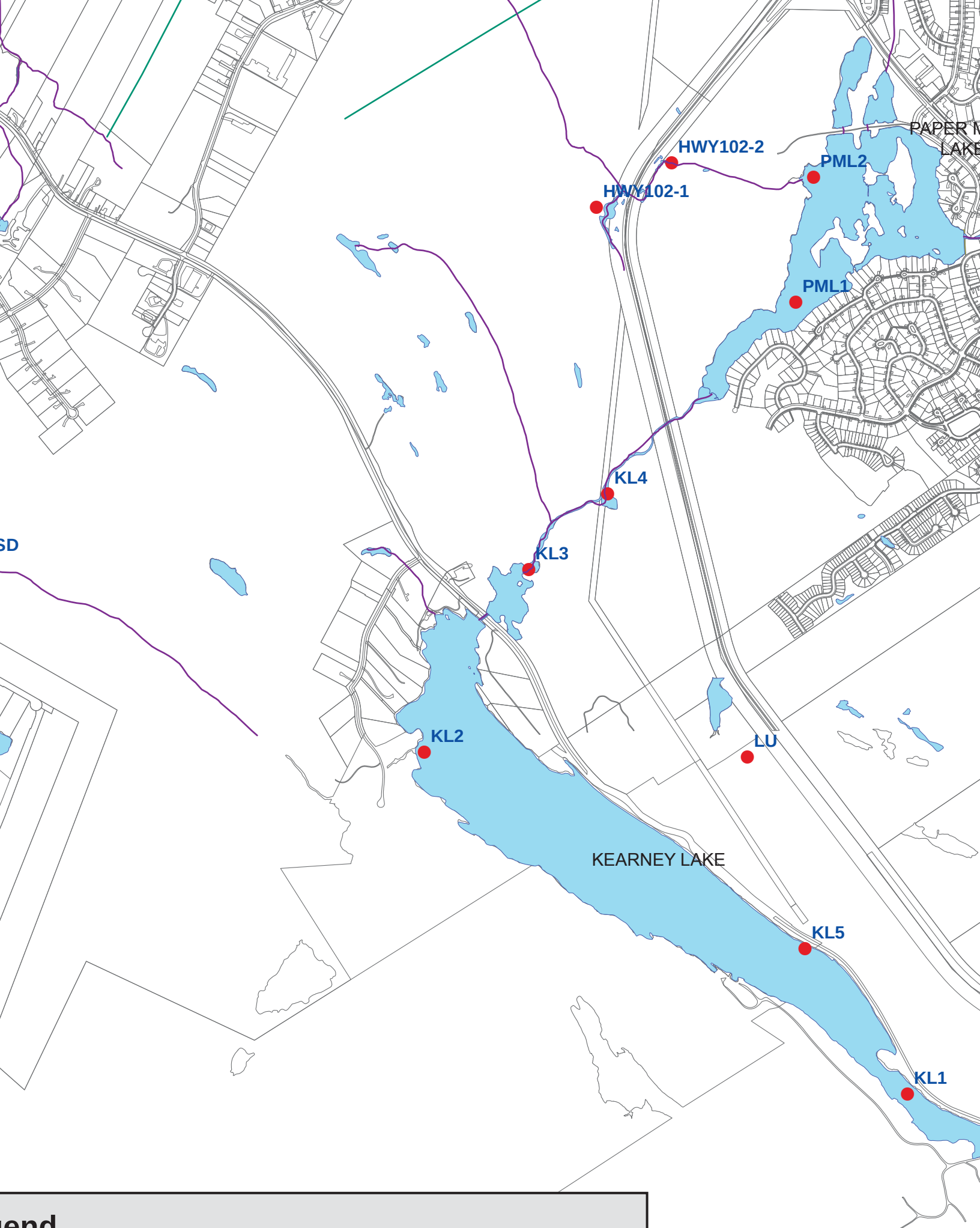
Water quality monitoring in the Bedford West development area has been ongoing since 2009. SNCL was retained by HRM to complete water quality monitoring programs each spring, summer and fall for two years beginning in 2015. The results of the fall 2016 monitoring program are detailed herein.

The overall purpose of the program is to conduct water quality sampling and testing prior to and during construction activities related to the development project in order to detect any impacts on and/or changes to water quality.

The fall 2016 sampling stations are summarized in Table 1 and shown in Figure 1.

Table 1: Bedford West Water Quality Sampling Stations

Water Course	Sample Location Name	Updated Coordinates (UTM NAD 83)	
		Easting	Northing
Kearney Lake	KL-1	20T445718E	4948496N
Kearney Lake	KL-2	20T0443859	4949738N
Kearney Run	KL-3	20T444390E	4950406N
Kearney Run	KL-4	20T444463E	4950571N
Kearney Lake	KL-5	20T4949142E	445280N
Creek Above Highway	HWY 102-1	20T444708E	4951644N
Creek Below Highway	HWY 102-2	20T444829E	4951778N
Lake Shore Drive	LSD	20T442583E	4950431N
Larry Uteck Off-Ramp	LU	20T444954E	4949891N
Paper Mill Lake	PML-1	20T445129E	4951154N
Paper Mill Lake	PML-2	20T445363E	4951740N


HWY102-2
HWY102-1
PML2
PML1
KL4
KL3
KL2
LU
KEARNEY LAKE
KL5
KL1

gend

2 METHODOLOGY

The fall 2016 water quality sampling event included the collection of Field Parameters (Group A) and surface water for laboratory analysis of:

- Inorganics (Group B);
- Calculated Parameters (Group C);
- Standard Elements/Metals (Group D); and
- Microbiological Analyses (Group E).

Table 2 below summarizes the water quality parameters measured in the field or analyzed by the laboratory.

Table 2: Analytical Parameter Groups

Field Parameters (A)	Inorganic (B)	Calculated Parameters (C)	Standard Metals (D)	Microbiological (E)
· pH · TDS · Dissolved Oxygen · Temperature · Secchi Depth · Conductance · Air Temperature · Cloud Cover · Incidental Wildlife Sightings	· Total Alkalinity (as $CaCO_3$) · Dissolved Chloride · Colour · Total Kjeldahl Nitrogen · Nitrate + Nitrite · Nitrate · Nitrite · Nitrogen (as NH4) · Total Organic Carbon · Orthophosphate (P) · pH · Low Total Phosphorus · Reactive Silica · Total Suspended Solids · Dissolved Sulphate · Turbidity · Conductivity	· Anion Sum · Cation Sum · Ion Balance · Bicarbonate Alkalinity(as $CaCO_3$) · Carbonate Alkalinity (as $CaCO_3$) · Hardness · Total Dissolved Solids · Saturation pH (@4°C & 20°C) · Langelier Index (@4°C & 20°C)	· Calcium · Copper · Iron · Magnesium · Manganese · Potassium · Sodium · Zinc	· Chlorophyll A · E. coli · Most Probable Number (MPN) or CFU per 100 mL

All surface water samples and associated field parameters were collected on October 25, 2016. Due to unforeseen circumstances, secchi depth measurements at five (5) sampling locations were collected on October 26, 2016. Throughout the next sampling events, water samples and secchi depth measurements will be collected on the same day to represent same conditions.

Field measurements of pH, dissolved oxygen, specific conductivity, water temperature and air temperature were taken at each station using an YSI PRO PLUS, instrument serial number 25680. The probe measures temperature, conductivity, DO, pH and ORP. The instrument is calibrated annually by the manufacturer and a pre-calibration was conducted by the provider (Pine Environmental) prior to

conducting the water quality sampling event. See Appendix A, Instrument Calibration Report.

Site conditions (i.e. weather, air temperature, cloud cover, site accessibility and wildlife sightings) and field parameters for each sampling location were recorded on a field report sheet. Each sample station was photographed during the sample event.

Water samples and field parameter readings were collected within a depth of 1.0 m below surface. Water samples were collected from the shore at all sample locations. Surface water sampling followed SNCL's Standard Operating Procedures (SOP) for surface water sampling. A new pair of nitrile gloves was used at each sample location.

Surface water samples were collected and placed in clean laboratory-supplied jars and stored in a chilled container together with a chain of custody record for transport to the laboratory. All surface water samples were submitted to AGAT Laboratories in Dartmouth, NS.

3 ASSESSMENT STANDARDS

- There is currently no national environmental quality guideline for phosphorus in freshwater aquatic environments. In the Canadian framework, trigger ranges are based on the trophic classification of the baseline condition. A trigger range is a desired concentration range for phosphorus; if the upper limit of the range is exceeded, it indicates potential for environmental quality issues, which "triggers" the need for further investigation. According to the Canadian Council of Ministers of the Environment (CCME) 10µg/L of total phosphorous is the threshold between oligotrophic and mesotrophic trophic classifications. For this water quality monitoring program, HRM defined a Total Phosphorous management threshold value of 10µg/L or 0.01mg/L.
- The Canadian Council of Ministers of the Environment (CCME) Guidelines for the Protection of Aquatic Life – Freshwater (PAL-F) were used for parameter such as Dissolved Oxygen, pH (in Situ and Laboratory analysis), Dissolved Chloride, Nitrate, Nitrite, Nitrogen, as well as for total metals (i.e. Aluminum, Arsenic, Boron, Cadmium, Cooper, Iron, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Uranium, and Zinc).
- For Total Suspended Solids (TSS), the CCME (2002) Water Quality Guidelines for the Protection of Aquatic Life at high flow conditions were applied. For TSS, the guideline value is equal to a maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. When background concentrations are greater than 250 mg/L, the concentration should not increase more than 10% from background levels.
- The Health Canada guidelines for Canadian Recreational Water Quality (2012, Third Edition) were used for parameters such as Secchi Depth (i.e. the guidelines indicate that the clarity of the water should be sufficiently clear such that a Secchi disk is visible at a minimum depth of 1.2

metres); pH (guideline of 5.0-9.0 pH); Turbidity (limit of 50 Nephelometric Turbidity Units); E. coli (400 MPN/100mL) and Fecal Coliform (400 MPN/mL).

- The Nova Scotia Environment (NSE) Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014) Table A2, Reference for Pathway Specific Standards for Surface Water (µg/L) for Fresh Water were used for assessment of total metals (i.e. Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Uranium, Vanadium and Zinc).

4 FIELD OBSERVATIONS

The fall 2016 site conditions were recorded for all eleven (11) surface water quality monitoring stations and are included in the field data sheets in **Appendix B**. Site condition observations include weather, cloud cover, air temperature, wildlife sightings and site accessibility.

In addition, site photographs are included in **Appendix C**.

5 FIELD MEASUREMENTS

Field measurements were recorded on field data sheets, which are enclosed in Appendix B and include collection of parameters such as in Situ pH, dissolved Oxygen, water temperature, conductivity and Secchi depth (where applicable).

Field measurements are also summarized in Table 3 attached at the end of Section 6.

Dissolved oxygen

Readings in seven (7) stations exceeded the CCME PAL-F recommended range of 5.5-9.5 mg/L as follows: KL1 (12.06 mg/L), KL2 (9.65 mg/L), KL3 (11.41 mg/L), KL4 (10.11 mg/L), KL5 (9.92 mg/L), PML1 (12.96 mg/L) and PML2 (10.31 mg/L).

pH (in Situ)

All in situ pH readings were outside recommended guidelines. Ten (10) stations reported pH concentrations outside the CCME-PAL-F recommended range of 6.5 - 9.0 as follows KL1 (6.23 pH), KL2 (5.54 pH), KL3 (5.58 pH), KL4 (6.14 pH), KL5 (5.72 pH), HWY102-1 (5.69 pH), HWY102-2 (5.36 pH), LSD (6.25 pH), LU (6.23 pH), and PML2 (5.37 pH). Station PML1 (4.63 pH) was outside the Health Canada Guideline for Recreational Water Quality of 5.0-9.0 pH.

6 ANALYTICAL RESULTS

Laboratory (AGAT) Certificates of Analysis for the fall 2016 event are enclosed in **Appendix D**. Analytical results are summarized in **Table 3** attached at the end of this section.

6.1 TOTAL PHOSPHOROUS

Total Phosphorus: Five (5) stations reported concentrations that exceeded the management threshold criteria of 10 µg/L (0.01 mg/L) listed in the HRM RFP 14-338:

- KL-2 0.013 mg/L
- HWY 102-2 0.012 mg/L
- LSD 0.012 mg/L
- LU 0.012 mg/L
- PML-1 0.013 mg/L

6.2 GENERAL CHEMISTRY

pH (Lab): was outside the CCME-PAL-F recommended range of 6.5 - 9.0 at the following four (4) stations: KL2 (6.19 pH), HWY102-1 (6.45 pH), HWY102-2 (6.15 pH) and LSD (6.38 pH).

6.3 METALS

Total Iron: Exceeded the CCME-PAL-F recommended limit of 300 µg/L at the following two (2) stations: HWY102-2 (375 µg/L) and LSD (303 µg/L). The NSE EQS guideline is also 300 µg/L.

Total Zinc: Exceeded the CCME-PAL-F recommended limit of 30 µg/L at station LU (52 µg/L).

6.4 MICROBIOLOGICAL

Eleven (11) E.coli samples were collected during the fall 2016 sampling program. E.coli did not exceed the Heath Canada Guideline of 400 CFU /100 mL in any of the samples collected.

	RDL (May 2016)	NSE ESQs for Surface Water (Applied)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	CCME Phosphorus Trigger Range (Applied)	Kearney Lake																		
						KL1																		
dd	--					2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/14	2012/10/10	2013/05/15	2013/08/16	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20	2015/08/25	20
	--					08:00	11:45	08:30	11:00	13:10	12:00	11:00	14:30	14:00	8:30	11:20	9:50	10:20	11:10	13:30	10:30	14:15	14:55	08:30	14:54	
	--	--	1.2	--		4.1	4.2	5.0	N/A	5.0	4.9	2.4	3.2	2.4	2.35	5.36	N/A	2.50	2.03	2.90	2.36	2.70	2.54	NCC	N/A	
	0.1	--	--	--		14.0	22.2	16.7	12.9	23.3	8.8	11.5	25.6	15.9	8.9	23.3	15.4	13.2	22.2	14.1	12.7	23.2	12.2	14.12	26.1	
	0.01	--	--	5.5 - 9.5		**10.77**	8.20	7.00	9.13	7.86	**10.48**	**10.69**	8.22	9.22	8.98	7.93	8.72	**9.76**	8.57	8.30	**15.29**	7.22	8.12	**9.55**	8.13	
	N/A	--	5.0-9.0	6.5 - 9.0		6.20	6.76	6.67	7.23	7.32	6.61	6.60	6.16	6.04	8.67	6.91	6.32	6.32	8.24	6.35	6.74	7.46	6.44	8.33	6.95	
	1	--	--	--		263	299	261	248	242	219	288	179	146	277	279	198.1	243	216.5	217.9	547.0	341.0	223.0	0.182	298.3	
	5	--	--	--		6	8	8	7	8	6	<5	9	7	24	7	<5	<5	<5	8	30	14	<5	5.2	6	
	1	--	--	120		81	74	64	62	60	55	73	45	33	66	70	50	66	59	48	80	76	46	60	62	
	5	--	--	--		18	18	16	26	8	21	28	40	45	50	11	20	11	37	20	13	8	23	37	8	
	0.05	--	--	--		0.18	0.09	0.12	0.21	0.16	0.23	0.2	0.11	0.13	0.20	0.09	0.10	0.18	0.14	0.19	0.11	0.11	0.08	0.15	0.15	
	0.05	--	--	13000		0.18	--	--	0.21	0.16	--	0.2	--	--	0.20	0.09	0.10	0.18	0.14	0.19	0.11	0.11	0.08	0.15	0.15	
	0.05	--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	
	0.03	--	--	19		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.04	0.03	<0.03	0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.050	<0.03	
	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.9	3.1	0.4	--	0.7	<0.4	1.1	<0.4	0.4	0.22	4.5	
	0.5	--	--	--		2.4	2.9	4.7	3.3	3.2	3.1	3.4	5.9	5.5	5.4	2.9	5.2	4.4	4.1	4.3	4.6	2.4	4.4	3.0	5.3	
	0.01	--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	
	N/A	--	5.0-9.0	6.5 - 9.0		6.94	6.65	6.68	6.91	7.00	6.79	6.52	6.51	6.52	6.7	7.2	6.9	6.78	6.93	6.85	6.72	7.06	**6.35**	6.62	6.95	
	0.1	--	--	--		9.2	8.5	7.2	7.72	8.66	8.30	7.65	4.82	5.31	6.8	8.4	6.3	7.5	6.6	6.5	8.1	11	6.0	6400	7.9	
	0.1	--	--	--		1.5	1.4	1.2	1.42	1.36	1.30	1.29	0.86	1.06	1.1	1.5	1.5	1.1	1.2	1.2	1.6	1.6	0.9	920	1.3	
	0.002	--	--	--	0.01	**<0.02**	**<0.02**	<0.002	0.009	0.007	0.005	0.008	**0.012**	0.009	**0.037**	**0.043**	0.007	0.007	**0.011**	0.008	**0.011**	**0.026**	0.01	0.008	0.002	
	0.1	--	--	--		1.1	0.9	1.3	0.876	0.888	0.901	0.788	0.773	0.871	0.7	0.9	0.9	0.8	0.7	1.1	0.9	1.6	0.7	680	0.9	
	0.1	--	--	--		51	46	37	31.8	35.2	33.8	43.7	22.8	19.8	40.1	42.0	29.8	35.8	26.2	31.6	50.2	54.2	37.6	33	43.3	
	0.5	--	--	--		2.6	2.2	2.3	2.9	2.7	2.9	2.8	1.9	2.3	2.4	1.3	2.2	2.5	1.8	2.2	2.0	1.5	1.8	2.5	1.8	
	5	--	--	--		1	1	<1	4	17	3	2	2	3	<5	<5	<5	<5	<5	5	<5	<5	<5	<1.0	<5	
	2	--	--	--		14	13	12	11	11	11	12	10	8	8	9	9	11	9	9	12	11	7	8.7	10	
	0.1	--	50	--		0.7	0.8	1.0	1.3	0.6	1	1	1	0.9	2.4	0.8	1.3	1.6	3.3	0.5	2.9	0.7	1.9	0.81	1.9	
	1	--	--	--		310	290	250	240	240	230	290	180	140	246	274	196	259	241	212	290	339	235	220	257	
	N/A	--	--	--		2.72	2.52	2.23	2.12	2.08	1.91	2.33	1.66	1.27	2.52	2.31	1.60	2.10	1.86	1.71	3.11	2.66	1.45	1.98	2.09	
	5	--	--	--		6	8	8	7	8	6	<1	9	7	24	7	<5	<5	<5	8	30	14.00	<5	5.2	6	
	1	--	--	--		166	151	131	123	125	118	143	92	77	139	137	98	124	104	103	172	165.00	99	120	130	
	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	
	N/A	--	--	--		2.85	2.57	2.12	1.92	2.10	2.02	2.42	1.33	1.25	2.24	2.41	1.79	2.08	1.61	1.84	2.77	3.09	2.05	1.84	2.43	
	N/A	--	--	--		29	27	23	25	27	26	24	16	18	21.5	27.2	21.9	23.3	21.4	21.2	26.8	34.10	18.7	20.0	25.1	
	N/A	--	--	--		2.33	0.98	2.53	4.95	0.48	2.80	1.89	11.00	0.79	5.9	2.1	5.3	0.7	7.3	3.4	5.8	7.50	17.2	3.66	7.5	
	N/A	--	--	--		-2.68	-2.87	-2.94	-2.72	-2.51	-2.87	NC	-3.18	-3.21	-2.69	-2.63	-3.19	-3.24	-3.14	-3.02	-2.51	-2.36	-3.76	-3.21	-2.97	
	N/A	--	--	--		-2.93	-3.12	-3.19	-2.97	-2.76	-3.12	NC	-3.43	-3.46	-3.01	-2.95	-3.51	-3.56	-3.46	-3.34	-2.83	-2.68	-4.08	-3.46	-3.29	
	N/A	--	--	--		9.62	9.52	9.62	9.63	9.51	9.66	NC	9.69	9.73	9.39	9.83	10.10	10.0	10.1	9.87	9.23	9.42	10.1	9.83	9.92	
	N/A	--	--	--		9.87	9.77	9.87	9.88	9.76	9.91	NC	9.94	9.98	9.71	10.2	10.4	10.3	10.4	10.2	9.55	9.74	10.4	10.1	10.2	
	5	5	--	5-100		**230**	--	--	**289**	47.8	--	**338**	--	--	**321**	43	**168**	**191**	**120**	56	**229**	42	**155**		--	
	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	2	5.0	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	5	1000	--	--		16	--	--	18.5	15.9	--	13	--	--	12	15	9	12	7	16	14	20	9	16	--	
	2	5.3	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	
	5	1200	--	1500		8	--	--	11.4	9.1	--	<50	--	--	<5	11	33	6	10	9	7	22	10	<50	--	
	0.017	0.01	--	0.017		<0.3	--	--	**0.053**	<0.017	--	**0.056**	--	--	**0.032**	**0.027**	**0.021**	**0.020**	<0.017	0.017	**0.037**	<0.017	**0.025**		--	
	1	---	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	**6**	<1	<1	<1.0	--	
	1	10	--	--		1	--	--	0.54	<0.40	--	0.79	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	
	1	2	--	2.0-4.0		<2	--	--	**5.8**	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<1	1	1	<1	1	<2.0	<1	
	50	300	--	300		130	--	--	**313**	62	125	177	162	**384**	229	137	195	207	132	92	147	124	168	110	157	
	0.5	1	--	1.0-7.0		<0.5	--	--	**10.3**	<0.50	--	<0.50	--	--	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	5.1	<0.5	<0.5	<0.50	--	
	2	820	--	--		100	--	--	79.2	57.1	59	78.4	52.3	55.8	48	65	68	73	48	24	48	115	42	39	41	
	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	
	2	25	--	25-150		5	--	--	3.2	<2.0	--	3.2	--	--	<2	<2	2	2	<2	<2	3	<2	3	<2.0	--	
	1	1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	
	0.1	0.1	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	
	5	21000	--	--		46	--	--	39.1	37.7	--	36	--	--	32	41	32	37	33	30	40	45	26	29	--	
	0.1	0.8	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	
	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	
	2	--	--	--		11	--	--	6.4	<2.0	--	5.4	--	--	8	<2	3	4	2	<2	2	<2	5	2.3	--	
	0.1	300	--	15		0.1	--	--	0.11	<0.10	--	0.12	--	--	0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.10	--	
	2	6	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	
	5	30	--	30		27	--	--	14.4	7.5	11.1	12.1	13.3	9.7	5	<5	11	11	6	5	14	<5	9	13	8	
mL	1	--	--	--		200	65	--	>250	63	>250	91	>250	--	2420	>2420	1120	1200	866	488	525	1550	>2420	---	980	
mL	1	--	400	--		39	24	--	9	15	37	8	**>250**	<100	41	11	17	48	2	7	<1	15	28	60	24	
l	--	--	400	--		--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---	--	
	0.05	--	--	--		0.53	0.79	1.11	1.73	1.47	0.99	0.76	1.44	1.36	0.62	2.3	1.54	1.22	1.40	1.19	0.40	0.41	0.84	0.64	1.14	
	0.05	--	--	--		0.48	0.69	1.17	1.61	1.42	0.81	0.69	1.15	1.14	0.63	2.3	2.16	1.40	1.40	1.19	1.32	0.36	0.8	0.62	1.11	

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009)
Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality
Blue shaded = Past Results - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

	RDL (May 2016)	NSE ESQs for Surface Water (Applied)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	CCME Phosphorus Trigger Range (Applied)	Kearney Lake																			
						KL2																			
dd	–					2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/14	2012/10/10	2013/05/15	2013/08/15	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20	2015/08/25	20
	–					11:00	10:30	10:45	10:15	12:25	10:50	09:30	14:00	13:15	9:50	10:30	10:20	09:10	16:10	14:30	10:45	9:20	14:04	09:15	13:29	
	–	--	1.2	–		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	
s	0.1	--	–	–		16.8	18.2	15.4	13.5	20.4	8.0	9.9	19.1	14.1	7.6	21.8	12.3	10.1	22.9	9.7	11.7	21.1	10.8	13.13	24.7	
	0.01	--	–	5.5 - 9.5		**10.16**	8.50	5.70	6.28	**4.66**	**9.58**	**9.66**	7.06	8.43	6.47	5.82	7.63	9.37	6.38	7.40	**14.90**	6.95	7.7	8.41	7.28	
	N/A	--	5.0-9.0	6.5 - 9.0		6.33	6.35	6.19	6.61	6.96	6.25	6.77	5.90	5.62	7.72	6.41	6.29	5.75	7.47	5.57	6.60	7.22	5.79	6.36	5.88	
	1	--	–	–		46	106	89	199	104	75	80	67	54	58	96.6	61.1	77.9	65.3	64.5	188.0	266.0	63.0	0.053	107.9	
	5	--	–	–		8	8	8	8	7	<5	<5	7	<5	20	<5	8	<5	<5	<5	29	7	28	<5.0	7	
	1	--	–	120		48	48	48	48	25	17	19	14	10	16	20	12	19	21	14	20	17	12	15	14	
	5	--	–	–		20	20	20	20	63	95	80	110	120	52	60	94	37	90	71	25	44	168	50	63	
	0.05	--	–	–		0.19	0.19	0.19	0.19	0.07	0.06	0.12	0.07	<0.05	0.11	0.08	<0.05	0.12	<0.05	<0.05	0.08	<0.05	<0.05	0.059	0.08	
	0.05	--	–	13000		0.19	0.19	0.19	0.19	0.07	--	0.12	--	--	0.11	0.08	<0.05	0.12	<0.05	<0.05	0.08	<0.05	<0.05	0.059	0.08	
	0.05	--	–	60		<0.05	<0.05	<0.05	<0.05	<0.01	–	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	
	0.03	--	–	19		<0.03	<0.03	<0.03	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	0.04	<0.03	<0.050	<0.03	
	0.4	--	–	–		--	--	--	--	--	--	--	--	–	<0.4	2.2	0.7	--	1.1	<0.4	<0.4	0.4	<0.4	0.4	0.8	
	0.5	--	–	–		4.3	4.3	4.3	4.3	6.6	9.7	6.5	10	12	8.1	7.1	10.9	7.5	11.1	10.9	6.2	6.6	12.9	4.0	13.3	
	0.01	--	–	–		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	
	N/A	--	5.0-9.0	6.5 - 9.0		6.85	6.85	6.85	6.85	6.78	**6.11**	**6.27**	**6.4**	**6.05**	6.5	6.7	6.5	**6.37**	6.62	**6.34**	6.53	6.87	**6.06**	**6.32**	6.99	
	0.1	--	–	–		6.5	6.5	6.5	6.5	4.08	3.55	2.51	2.48	2.21	2.4	3.6	2.9	2.7	2.5	2.4	3.4	4.0	2.4	2600	3.4	
	0.1	--	–	–		1.2	1.2	1.2	1.2	0.98	0.84	0.63	0.64	0.36	0.7	1.0	1.0	0.7	0.5	0.8	1.1	1.0	0.6	640	0.9	
	0.002	--	–	–	0.01	**0.02**	**0.02**	**0.02**	**0.02**	0.009	0.009	0.009	0.008	**0.013**	**0.021**	**0.059**	**0.013**	**0.010**	**0.020**	**0.029**	**0.013**	**0.039**	**0.03**	0.008	**0.012**	
	0.1	--	–	–		1.1	1.1	1.1	1.1	0.634	0.826	0.534	0.497	0.734	0.5	0.7	0.8	0.5	0.5	0.7	0.7	0.9	0.7	540	0.7	
	0.1	--	–	–		31.6	31.6	31.6	31.6	14.7	10.6	11.1	7.8	6.9	9.8	14.2	9.5	8.9	7.0	7.9	17.5	14.0	7.6	8.4	11.5	
	0.5	--	–	–		2.2	2.2	2.2	2.2	4.2	4.7	2.7	4.3	4	2.6	4.0	4.9	2.8	4.4	4.9	2.4	3.3	4.6	2.0	3.7	
	5	--	–	–		103	103	103	103	7	<1	<1	<2	<1	<5	<5	<5	<5	135	<5	<5	<5	<5	<1.0	<5	
	2	--	–	–		9	9	9	9	<2	<2	<2	<2	<2	3	3	2	4	5	4	4	2	3	2.8	<2	
	0.1	--	50	–		0.5	0.5	0.5	0.5	1.0	1.0	0.4	0.7	0.6	0.5	1.1	1.0	1.9	2.2	1.0	0.9	0.8	1.2	<1.0	1.6	
	1	--	–	–		212	212	212	212	100	97	79	66	54	71	91	61	83	69	62	87	94	66	64	81	
	N/A	--	–	–		0.49	0.82	0.45	0.77	0.85	0.49	0.53	0.53	0.28	0.92	0.63	0.54	0.63	0.70	0.48	1.23	0.66	0.96	0.48	0.54	
	5	--	–	–		<1	8	<1	5	7	<1	<1	7	<1	20	<5	8	<5	<5	<5	29	7	28	<1.0	7	
	1	--	–	–		36	55	35	46	55	38	37	34	25	45	44	34	37	37	31	65	44	44	32	36	
	10	--	–	–		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	
	N/A	--	–	–		0.71	0.99	0.67	0.74	0.95	0.74	0.68	0.55	0.49	0.65	0.94	0.73	0.63	0.54	0.60	1.07	0.97	0.57	0.57	0.82	
	N/A	--	–	–		10	15	10	12	14	12	9	9	8	8.9	13.1	11.4	9.6	8.3	9.3	13.0	14.1	8.5	9.1	12.2	
	N/A	--	–	–		18.30	9.39	19.60	1.99	5.56	20.30	12.40	1.85	27.30	17.6	19.7	15.1	0.3	12.9	11.0	7.1	19.1	25.7	8.57	20.5	
	N/A	--	–	–		NC	-3.20	NC	-3.44	-3.05	NC	NC	-3.66	NC	-3.37	-3.60	-3.68	-4.05	-3.83	-4.12	-3.04	-3.23	-3.66	NC	-3.18	
	N/A	--	–	–		NC	-3.45	NC	-3.70	-3.30	NC	NC	-3.91	NC	-3.69	-3.92	-4.00	-4.37	-4.15	-4.44	-3.36	-3.55	-3.98	NC	-3.50	
	N/A	--	–	–		NC	9.78	NC	10.00	9.83	NC	NC	10.10	NC	9.87	10.3	10.2	10.4	10.5	10.5	9.57	10.1	9.72	NC	10.20	
	N/A	--	–	–		NC	10.00	NC	10.30	10.10	NC	NC	10.30	NC	10.2	10.6	10.5	10.7	10.8	10.8	9.89	10.4	10.0	NC	10.5	
	5	5	–	5-100		**290**	--	–	**175**	**151**	–	**271**	--	--	**209**	**205**	**338**	**256**	**270**	**259**	**205**	**236**	**340**	**180**	--	
	2	20	–	–		<2	--	–	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	2	5.0	–	5		<2	--	–	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	5	1000	–	–		9	--	–	11.7	14.3	–	9.5	--	--	9	11	10	8	<5	13	13	18	9	9.2	--	
	2	5.3	–	–		<2	--	–	<1.0	<1.0	–	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	
	2	--	–	–		<2	--	–	<2.0	<2.0	–	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	–	
	5	1200	–	1500		8	--	--	14.7	12.7	–	<50	--	–	6	14	22	6	11	9	11	12	12	<50	--	
	0.017	0.01	–	0.017		<0.3	--	–	**0.018**	<0.017	–	<0.017	--	--	<0.017	<0.017	<0.017	<0.017	<0.017	**0.019**	<0.017	<0.017	**0.018**	**0.014**	--	
	1	---	–	1		<2	--	–	<1.0	<1.0	–	<1.0	--	--	<1	<1	<1	<1	<1	<1	**9**	<1	<1	<1.0	–	
	1	10	–	–		<1	--	–	<0.40	<0.40	–	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	–	
	1	2	–	2.0-4.0		<2	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<1	2	<1	<1	4	<2.0	<1	
	50	300	–	300		250	--	--	227	**403**	238	202	**418**	**358**	154	**541**	**813**	269	**528**	**523**	174	**723**	**305**	250	**641**	
	0.5	1	–	1.0-7.0		<0.5	--	–	1.01	<0.50	--	<0.50	--	--	<0.5	<0.5	1.1	<0.5	0.5	<0.5	5.8	<0.5	0.5	<0.50	--	
	2	820	–	–		26	--	–	43.2	83.3	34.7	12.1	68.4	22.6	17	90	114	24	67	53	33	146	25	47	120	
	2	73	–	73		<2	--	–	<2.0	<2.0	–	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	–	
	2	25	–	25-150		<2	--	–	<2.0	<2.0	–	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	–	
	1	1.0	–	1		<2	--	–	<1.0	<1.0	–	<1.0	--	--	<1	<1	1	<1	<1	<1	<1	<1	<1	<1.0	–	
	0.1	0.1	–	0.1		<0.5	--	--	**0.42**	<0.10	–	<0.10	--	–	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	
	5	21000	–	–		14	--	–	17.8	19.5	--	11.9	--	--	10	18	15	12	9	12	16	17	12	12	--	
	0.1	0.8	–	0.8		<0.1	--	–	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	
	2	--	–	–		<2	--	–	<2.0	<2.0	–	<2.0	--	--	<2	<2	3	<2	<2	<2	<2	<2	<2	<2.0	--	
	2	--	–	–		2	--	–	<2.0	<2.0	–	2.8	--	--	<2	2	3	4	<2	2	2	<2	3	2.5	--	
	0.1	300	–	15		<0.1	--	–	<0.10	<0.10	–	<0.10	--	–	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	–	
	2	6	–	–		<2	--	--	<2.0	<2.0	–	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	
	5	30	–	30		8	--	–	5.4	5.3	6.5	<5.0	<5.0	<5.0	<5	<5	<5	7	<5	<5	<5	<5	<5	<5.0	<5	
mL	1	--	–	–		1800	170	–	>250	11	>250	59	>250	--	>2420	1986	>2420	>2420	>2420	>2420	525	>2420	>2420	---	>2420	
mL	1	--	400	–		**1500**	100	–	**>250**	6	6	2	**>250**	<100	3	7	3	12	6	2	<1	18	11	30	11	
l	–	--	400	–		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	0.05	--	–	–		0.82	6.05	1.97	0.73	0.55	0.22	0.44	0.89	0.97	0.53	2.2	0.07	0.62	1.00	0.73	0.13	0.83	0.41	0.34	0.96	
	0.05	--	–	–		0.87	5.97	1.95	0.66	0.54	0.21	0.42	0.73	0.82	0.56	2.2	0.12	0.72	1.00	0.74	0.14	0.86	0.41	---	1.26	

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
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Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009) (Referenced)
Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality
Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

s	RDL (May 2016)	NSE ESQs for Surface Water (Applied)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	CCME Phosphorus Trigger Range (Applied)	Kearney Lake																		
						KL3																		
n-dd	--					2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/14	2012/10/10	2013/05/15	2013/08/16	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20	2015/08/25
m	--					09:00	11:00	09:30	11:30	14:12	11:40	10:30	12:20	12:00	10:26	12:20	11:20	9:50	10:00	14:00	11:00	11:50	14:25	10:35	11:45
ers	--	--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A
us	0.1	--	--	--		14.0	21.6	17.3	14.7	23.1	9.9	10.3	21.1	15.5	9	24.5	15.6	11.7	21.5	13.6	11.0	22.7	12.8	14.73	25.0
L	0.01	--	--	5.5 - 9.5		**10.79**	8.00	8.00	9.26	7.83	**10.35**	**11.06**	8.42	**9.60**	8.89	8.17	7.72	**10.20**	9.20	8.90	5.90	7.87	8.12	8.02	**9.91**
	N/A	--	5.0-9.0	6.5 - 9.0		7.27	6.74	6.97	7.27	7.33	6.76	6.83	6.96	6.30	7.68	6.85	6.51	5.86	7.25	6.49	6.55	7.37	6.67	6.84	6.87
m	1	--	--	--		95	282	246	220	228	199	220	175	161	204	225	177.2	207.3	194.4	210.6	405.0	252.0	208.0	0.185	245.1
L	5	--	--	--		<5	7	7	6	7	7	6	7	7	23	6	5	<5	5	7	15	5	6	<5.0	6
L	1	--	--	120		66	63	60	55	55	53	56	43	37	50	57	46	54	40	46	58	46	45	60	56
U	5	--	--	--		22	20	20	28	12	20	31	38	40	57	15	31	19	23	20	16	13	20	34	13
L	0.05	--	--	--		0.14	0.12	0.14	0.24	0.15	0.22	0.24	0.15	0.16	0.19	0.09	0.09	0.21	0.11	<0.05	0.17	0.13	0.13	0.16	0.12
L	0.05	--	--	13000		0.14	--	--	0.24	0.15	--	0.24	--	--	0.19	0.09	0.09	0.21	0.11	<0.05	0.17	0.13	0.13	0.16	0.12
L	0.05	--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05
L	0.03	--	--	19		<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.050	<0.03
L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	<0.4	2.8	<0.4	--	1.3	<0.4	0.6	0.4	0.4	0.15	1.2
L	0.5	--	--	--		2.6	3.9	4.3	3.6	3.1	3.3	3.8	5.1	5	5.9	3.4	4.9	4.3	4.4	4.6	4.6	2.8	4.5	3.4	5.7
L	0.01	--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
	N/A	--	5.0-9.0	6.5 - 9.0		**6.38**	6.67	6.82	6.82	6.99	6.87	6.52	6.5	**6.38**	6.7	7.1	6.9	6.68	6.96	6.86	6.68	6.87	6.59	6.54	6.92
L	0.1	--	--	--		6.7	7.1	6.8	6.81	7.98	8.29	7.09	4.73	5.63	5.7	6.9	6.0	7.0	5.3	6.8	6.4	7.9	6.8	6600	7.8
L	0.1	--	--	--		1.2	1.2	1.11	1.22	1.28	1.27	1.21	0.83	1.01	1.0	1.2	1.3	1.0	0.9	1.3	1.4	1.2	1.0	940	1.2
L	0.002	--	--	--	0.01	**<0.02**	**<0.02**	0.005	0.005	<0.002	0.003	0.008	0.003	**0.012**	**0.019**	**0.045**	0.007	0.006	0.006	**0.012**	0.009	**0.023**	**0.15**	0.004	0.004
L	0.1	--	--	--		0.9	1.1	0.9	0.791	0.837	0.990	0.879	0.681	0.921	0.7	0.9	0.9	0.8	0.6	1.2	0.8	1.1	0.9	770	0.9
L	0.1	--	--	--		38	38	35	28.3	33.1	33.0	33.0	20.8	21.3	31.2	34.5	26.37	35.1	20.1	32.1	36.4	39.0	35.3	34	40.0
L	0.5	--	--	--		2.7	2.6	2.6	3.2	2.9	3.2	2.9	2.5	2.6	2.7	2.0	2.6	2.9	2.6	2.7	2.6	1.9	2.4	2.5	2.4
L	5	--	--	--		<1	1	1	2	<2	<1	<1	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	2.8	<5
L	2	--	--	--		11	12	12	10	10	10	9	10	8	7	8	7	7	7	8	9	7	7	7.9	9
U	0.1	--	50	--		0.7	1.4	0.6	0.3	0.5	0.6	0.6	0.6	0.4	0.8	0.7	1	0.7	2.4	0.4	0.4	0.3	0.9	0.7	0.5
m	1	--	--	--		250	250	240	220	220	220	220	170	160	197	222	182	219	216	204	218	243	216	220	242
L	N/A	--	--	--		2.11	2.17	2.08	1.90	1.93	1.87	1.90	1.58	1.36	2.03	1.90	1.55	1.68	1.38	1.60	2.14	1.55	1.54	1.87	1.90
L	5	--	--	--		<1	7	7	6	7	7	6	7	7	23	6	5	<5	5	7	15	5	6	<1.0	6.0
L	1	--	--	--		128	130	123	110	117	116	115	88	82	111	113	91	106	78	100	122	106	100	110	119
L	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10
L	N/A	--	--	--		2.12	2.16	1.99	1.69	1.97	1.98	1.92	1.23	1.32	1.77	1.98	1.60	2.00	1.24	1.89	2.07	2.23	2.00	1.89	2.27
L	N/A	--	--	--		22	23	22	22	25	26	23	15	18	18.4	22.2	20.3	21.6	16.9	22.3	21.7	24.7	21.1	20	24.4
	N/A	--	--	--		0.24	0.23	2.21	5.85	1.03	2.86	0.52	12.50	1.49	6.8	2.1	1.6	8.6	5.5	8.3	1.5	17.9	12.8	0.53	9.0
A	N/A	--	--	--		NC	-3.00	-2.89	-2.92	-2.60	-2.73	-3.23	-3.33	-3.35	-2.77	-2.88	-3.21	-3.37	-3.19	-3.05	-2.93	-3.12	-3.39	NC	-3.00
A	N/A	--	--	--		NC	-3.25	-3.14	-3.17	-2.85	-2.99	-3.49	-3.58	-3.60	-3.09	-3.20	-3.53	-3.69	-3.51	-3.37	-3.25	-3.44	-3.71	NC	-3.32
A	N/A	--	--	--		NC	9.67	9.71	9.74	9.59	9.60	9.75	9.83	9.73	9.47	9.98	10.10	10.0	10.2	9.91	9.61	9.99	9.98	NC	9.92
A	N/A	--	--	--		NC	9.92	9.96	9.99	9.84	9.86	10.00	10.10	9.98	9.79	10.3	10.4	10.4	10.5	10.2	9.93	10.3	10.3	NC	10.2
_	5	5	--	5-100		**259**	**259**	--	**124**	53.5	--	**266**	--	--	**199**	54	**153**	**140**	65	100	**260**	52	**105**	**180**	--
_	2	20	--	--		<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--
_	2	5.0	--	5		<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--
_	5	1000	--	--		13	13	--	15.7	13.2	--	19.1	--	--	18	17	15	19	9	18	17	17	16	19	--
_	2	5.3	--	--		<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--
_	2	--	--	--		<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--
_	5	1200	--	1500		9	9	--	7.8	8.7	--	<50	--	--	5	9	17	7	7	10	8	10	12	<50	--
_	0.017	0.01	--	0.017		0.019	0.019	--	**0.030**	<0.017	--	**0.046**	--	--	**0.019**	**0.021**	**0.027**	**0.028**	<0.017	<0.017	**0.038**	<0.017	0.017	**0.033**	--
_	1	---	--	1		<1	<1	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	**7**	<1	<1	<1.0	--
_	1	10	--	--		<1	<1	--	<0.40	<0.40	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--
_	1	2	--	2.0-4.0		2	2	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<1	1	1	<1	2	<2.0	1.0
_	50	300	--	300		**523**	**523**	--	73	133	58	136	104	154	137	136	119	131	71	172	137	96	118	120	165
_	0.5	1	--	1.0-7.0		<0.5	<0.5	--	0.60	<0.50	--	<0.50	--	--	<0.5	<0.5	0.7	<0.5	<0.5	0.9	3.6	<0.5	<0.5	<0.50	--
_	2	820	--	--		53	53	--	36.8	67.1	32.1	41.5	33.1	32.5	25	47	46	37	20	92	41	45	27	36	48
_	2	73	--	73		<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--
_	2	25	--	25-150		<2	<2	--	2.0	<2.0	--	2.3	--	--	<2	<2	<2	<2	<2	<2	2	<2	<2	<2.0	--
_	1	1.0	--	1		<1	<1	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--
_	0.1	0.1	--	0.1		<0.1	<0.1	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--
_	5	21000	--	--		12	12	--	33.5	35.9	--	33.2	--	--	25	33	29	33	18	32	31	32	29	29	--
_	0.1	0.8	--	0.8		<0.1	<0.1	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--
_	2	--	--	--		<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--
_	2	--	--	--		2	2	--	<2.0	<2.0	--	4.9	--	--	<2	<2	<2	<2	<2	2	3	<2	2	2.7	--
_	0.1	300	--	15		<0.1	<0.1	--	<0.10	<0.10	--	0.11	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	--
_	2	6	--	--		<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--
_	5	30	--	30		<5	<5	--	9.7	6.9	6.4	9.3	6.6	9.2	<5	<5	8	10	5	7	10	<5	6	8.7	7
00mL	1	--	--	--		120	24	--	190	16	58	72	110	--	291	1553	178	345	2420	1300	86	1730	>2420	---	2420
00mL	1	--	400	--		1	17	--	2	<1	8	5	37	<100	2	<1	3	8	21	<1	<1	<1	13	<0.10	7
7ml	--	--	400	--		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---	--
_	0.05	--	--	--		1.04	1.11	1.18	1.30	1.14	0.51	0.78	1.26	1.24	0.52	1.3	0.81	1.44	2.00	0.65	0.76	0.59	1.23	0.72	1.27
_	0.05	--	--	--		0.94	0.97	1.21	1.09	1.19	0.42	0.67	0.98	1.01	0.55	1.2	1.14	1.62	2.30	0.61	0.69	0.51	1.12	0.68	1.34

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
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Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water

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Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline, NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Units	RDL (May 2016)	NSE ESQs for Surface Water (Applied)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	CCME Phosphorus Trigger Range (Applied)	Kearney Lake																			
						KL4																			
yyyy-mm-dd	--					2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/14	2012/10/10	2013/05/15	2013/08/16	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20	2015/08/25	2015/10/
hh:mm	--					10:00	11:30	10:00	11:20	13:50	11:15	10:10	11:40	11:40	10:16	12:00	11:40	9:41	10:30	14:20	11:15	11:35	14:35	10:25	11:02	11:15
Meters	--	--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A
Celsius	0.1	--	--	--		13.4	21.9	17.3	14.5	21.9	9.8	10.1	21.2	15.3	9.0	24.4	15.7	11.7	20.4	13.5	11.0	21.8	12.5	14.75	24.7	9.5
mg/L	0.01	--	--	5.5 - 9.5		**10.87**	8.10	8.30	9.01	6.27	**10.89**	**10.99**	**8.55**	**9.65**	8.70	7.32	8.87	**10.09**	8.89	**9.60**	**14.50**	5.92	7.52	**9.81**	9.09	8.8
pH	N/A	--	5.0-9.0	6.5 - 9.0		8.00	6.71	6.94	7.19	6.98	6.07	6.49	6.43	6.02	9.0	6.71	6.77	5.72	7.08	6.41	6.30	7.25	6.55	6.64	6.81	7.09
uS/cm	1	--	--	--		771	262	247	224	226	215	218	172	126	206	225	185.9	207.1	196.2	209.0	273.0	251.0	208.0	0.188	243.5	232.4
mg/L	5	--	--	--		5	7	7	6	8	7	5	8	7	22	8	<5	<5	<5	<5	30	5	29	<5.0	6	7
mg/L	1	--	--	120		67	65	60	56	56	53	56	44	37	51	57	46	54	41	47	59	47	48	61	56	55
TCU	5	--	--	--		22	18	20	27	11	20	32	38	43	48	11	20	17	21	20	13	11	28	33	10	12
mg/L	0.05	--	--	--		0.15	0.12	0.14	0.23	0.19	0.21	0.23	0.15	0.17	0.19	0.11	0.09	0.20	0.11	0.17	0.25	0.17	0.16	0.16	0.14	0.21
mg/L	0.05	--	--	13000		0.15	--	--	0.23	0.19	--	0.23	--	--	0.19	0.11	0.09	0.20	0.11	0.17	0.25	0.17	0.16	0.16	0.14	0.21
mg/L	0.05	--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05
mg/L	0.03	--	--	19		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	<0.03	0.04
mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.5	<0.4	0.7	--	1.8	1.1	<0.4	<0.4	<0.4	0.21	0.4	1.0
mg/L	0.5	--	--	--		2.5	2.6	4.0	3.3	2.6	3.1	3.7	6	5.4	7.5	3.2	4.8	4.2	4.5	4.3	4.4	2.1	4.4	2.8	5.2	5.7
mg/L	0.01	--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01
pH	N/A	--	5.0-9.0	6.5 - 9.0		6.61	6.75	6.83	6.83	6.93	6.83	6.57	6.57	**6.46**	6.7	7.0	6.9	6.69	6.96	6.85	6.69	6.91	6.85	6.59	6.94	6.97
mg/L	0.1	--	--	--		6.8	7.7	7.0	6.81	8.00	8.45	6.84	4.93	5.24	5.7	6.8	5.8	6.8	5.1	6.8	6.4	7.9	6.8	6500	7.9	3.7
mg/L	0.1	--	--	--		1.2	1.3	1.2	1.22	1.24	1.31	1.19	0.86	0.99	1.0	1.2	1.2	1.0	0.8	1.2	1.3	1.2	1.0	920	1.3	1.0
mg/L	0.002	--	--	--	0.01	**<0.02**	**<0.02**	<0.002	0.004	<0.002	<0.002	0.007	0.003	**0.026**	**0.022**	**0.043**	0.007	0.006	**2.39**	**0.016**	**0.022**	**0.031**	**0.015**	0.006	0.007	0.003
mg/L	0.1	--	--	--		1	1	1	0.807	0.905	0.968	0.826	0.733	1.130	0.7	1.0	0.9	0.8	0.6	1.2	0.8	1.1	0.9	760	0.9	0.7
mg/L	0.1	--	--	--		39	41	37	28.5	34.3	33.9	32.1	21.5	21.1	31.5	34.5	25.2	31.6	20.1	30.7	35.9	38.6	34.1	34	40.0	28.2
mg/L	0.5	--	--	--		2.7	2.6	2.6	3.1	2.9	3.1	2.9	2.5	2.7	2.7	2.2	2.6	3.0	2.6	2.5	2.6	2.1	2.5	2.5	2.6	3.0
mg/L	5	--	--	--		<1	1	<1	<2	<2	<1	2	<1	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.0	7.0	<5
mg/L	2	--	--	--		11	12	11	10	10	10	9	10	8	7	8	7	7	7	9	9	8	8	7.7	9.0	8
NTU	0.1	--	50	--		0.5	1.0	0.3	0.3	0.2	0.8	0.7	0.7	0.4	0.7	0.4	0.8	0.7	2.6	2.1	1.1	0.6	0.8	0.61	0.7	1.2
µS/cm	1	--	--	--		260	250	230	220	230	250	210	170	160	200	224	183	218	218	204	219	241	218	220	241	235
me/L	N/A	--	--	--		2.23	2.22	2.09	1.91	1.94	1.85	1.88	1.62	1.36	2.04	1.94	1.45	1.68	1.31	1.53	2.47	1.60	2.11	1.88	1.90	1.87
mg/L	5	--	--	--		5	7	7	6	8	7	5	8	7	22	8	<5	<5	<5	<5	30	5	29	<1.0	6.0	7
mg/L	1	--	--	--		132	135	125	111	118	116	113	90	81	111	114	87	103	75	97	132	108	117	110	121	102
mg/L	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10
me/L	N/A	--	--	--		2.16	2.32	2.07	1.70	2.02	2.03	1.86	1.28	1.3	1.78	1.97	1.53	1.84	1.23	1.84	2.04	2.21	1.94	1.91	2.35	1.53
mg/L	N/A	--	--	--		22	25	22	22	25	27	22	16	17	18.4	21.9	19.4	21.1	16.0	21.9	21.3	24.7	21.1	20	25.1	13.4
%	N/A	--	--	--		1.59	2.20	0.48	5.82	2.02	4.64	0.53	11.70	2.26	6.6	0.8	2.8	4.5	3.2	9.2	9.5	15.8	4.2	0.79	10.7	10.1
N/A	N/A	--	--	--		-3.21	-2.89	-2.84	-2.92	-2.64	-2.75	-3.22	-3.18	-3.31	-2.79	-2.86	-3.22	-3.37	-3.21	-3.21	-2.63	-3.08	-2.45	NC	-2.98	-3.20
N/A	N/A	--	--	--		-3.46	-3.14	-3.09	-3.17	-2.89	-3.00	-3.47	-3.43	-3.56	-3.11	-3.18	-3.54	-3.69	-3.53	-3.53	-2.95	-3.40	-2.77	NC	-3.30	-3.52
N/A	N/A	--	--	--		9.82	9.64	9.67	9.75	9.57	9.58	9.79	9.75	9.77	9.49	9.86	10.10	10.1	10.2	10.1	9.32	9.99	9.30	NC	9.92	10.2
N/A	N/A	--	--	--		10.1	9.9	9.9	10.0	9.8	9.8	10.0	10.0	10.0	9.8	10.2	10.4	10.4	10.5	10.4	9.64	10.3	9.62	NC	10.2	10.5
µg/L	5	5	--	5-100		**150**	--	--	**125**	29.2	--	**231**	--	--	**188**	48	**149**	**141**	**106**	**159**	**236**	46	93	**160**	--	84
µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2
µg/L	2	5.0	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2
µg/L	5	1000	--	--		16	--	--	16.6	17.8	--	18.2	--	--	18	17	16	18	10	19	17	19	16	20	--	17
µg/L	2	5.3	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2
µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2
µg/L	5	1200	--	1500		6	--	--	8.6	9.1	--	<50	--	--	6	9	16	7	6	9	8	11	11	<50	--	<5
µg/L	0.017	0.01	--	0.017		<0.3	--	--	**0.031**	<0.017	--	**0.035**	--	--	**0.021**	<0.017	**0.027**	**0.027**	0.017	**0.050**	**0.027**	<0.017	<0.017	**0.033**	--	<0.017
µg/L	1	---	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	6	<1	<1	<1	**6**	<1	<1	<1.0	--	<1
µg/L	1	10	--	--		<1	--	--	<0.40	<0.40	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1
µg/L	1	2	--	2.0-4.0		<2	--	--	<2.0	2.4	<2.0	2.3	<2.0	<2.0	<2	<2	4	**9**	<1	1	<1	<1	2	**6.8**	1	1
µg/L	50	300	--	300		86	--	--	82	51	55	119	109	138	129	118	133	213	144	248	129	55	104	100	217	83
µg/L	0.5	1	--	1.0-7.0		<0.5	--	--	3.23	<0.50	--	<0.50	--	--	<0.5	<0.5	0.8	0.9	<0.5	<0.5	2.6	<0.5	<0.5	<0.50	--	<0.5
µg/L	2	820	--	--		51	--	--	34.5	63.5	29.4	38.5	27.2	29.7	23	34	38	34	77	130	34	29	24	25	78	34
µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2
µg/L	2	25	--	25-150		3	--	--	2.0	<2.0	--	<2.0	--	--	<2	<2	5	<2	<2	<2	<2	<2	<2	<2.0	--	<2
µg/L	1	1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	**3**
µg/L	0.1	0.1	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1
µg/L	5	21000	--	--		34	--	--	33.1	36.7	--	32.7	--	--	25	32	28	32	17	31	31	31	29	30	--	20
µg/L	0.1	0.8	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1
µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	5	<2	<2	<2	<2	<2	<2.0	--	<2
µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	4.2	--	--	<2	<2	<2	<2	<2	3	2	<2	<2	<2.0	--	<2
µg/L	0.1	300	--	15		<0.1	--	--	<0.10	<0.10	--	0.1	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1
µg/L	2	6	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2
µg/L	5	30	--	30		14	--	--	10.4	6.9	7	11.3	7.4	7	<5	<5	**68**	21	<5	9	9	<5	<5	9.6	8	12
MPN/100mL	1	--	--	--		28	58	--	100	16	75	83	95	--	345	>2420	921	548	>2420	770	308	1550	>2420	---	>2420	281
MPN/100mL	1	--	400	--		4	33	--	1	<1	2	5	39	<100	4	<1	4	6	38	<1	<1	1	8	<10	5	1
MPN/ml	--	--	400	--		--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
µg/L	0.05	--	--	--		0.78	1.11	1.06	0.92	0.07	0.50	0.60	1.04	1.31	0.52	0.7	0.55	1.34	1.50	0.40	0.44	0.50	1.03	0.55	0.26	1.09
µg/L	0.05	--	--	--		0.69	0.96	1.11	0.77	0.07	0.41	0.55	0.82	1.07	0.55	0.7	0.74	1.48	1.70	0.39	0.40	0.57	0.95	0.51	0.31	0.55

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" – '' = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009) (Referenced)
Nova Scotia Environment Environmental Quality Standards for Surface Water (Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014)
Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality
Blue shaded = Past Results - Parameter concentration exceeds CCME FWAL Guideline, the NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

2016	Units	RDL (May 2016)	NSE ESQs for Surface Water (Applied)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	CCME Phosphorus Trigger Range (Applied)	Kearney Lake														
							KL5														
	yyyy-mm-dd	–					2011/10/17	2012/05/01	2012/08/14	2012/10/10	2013/05/15	2013/08/16	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20	2015/08/25	2015/10/22	2016/05/16	2016/08/16	2016/10/25
	hh:mm	–					9:40	10:52	13:10	12:10	10:03	10:50	13:45	11:30	13:55	10:45	09:00	12:04	12:00	10:00	8:00	13:05
	Meters	–	--	1.2	–		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	2.74	2.1	5.3	4.2
	Celsius	0.1	--	–	–		14.7	10.5	26.1	16.6	13.3	22.7	14.7	13.7	22.9	12.8	14.06	25.4	9.4	12.22	22.2	12.7
	mg/L	0.01	--	–	5.5 - 9.5		9.38	7.88	7.90	8.16	**9.67**	8.89	8.60	**15.83**	7.64	7.91	8.32	8.75	7.63	**10.47**	8.39	**9.920**
	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.52	7.76	6.69	6.72	6.20	8.57	6.51	6.79	7.86	6.60	7.82	6.77	7.05	**5.75**	**5.11**	**5.720**
ce	uS/cm	1	--	–	–		112	230	229	189.0	219.5	202.1	212.9	472.0	251.0	211.0	0.184	249.8	240.8	209		243.2
CaCO3)	mg/L	5	--	–	–		9	21	8	<5	<5	6	5	32	<5	<5	5.4	6	7	<5	7	9
(Cl)	mg/L	1	--	–	120		37	55	57	48	58	44	46	61	47	47	59	58	58	54	56	53
	TCU	5	--	–	–		35	43	10	27	10	22	18	14	11	22	35	8	19	27	13	17
	mg/L	0.05	--	–	–		0.17	0.19	0.15	0.83	0.21	0.21	0.25	0.16	0.10	0.16	0.16	0.12	0.19	0.14	0.19	0.15
	mg/L	0.05	--	–	13000		--	0.19	0.15	0.83	0.21	0.21	0.20	0.16	0.10	0.16	0.16	0.12	0.19	0.14	0.09	0.15
	mg/L	0.05	--	–	60		--	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.10	<0.05
Nitrogen)	mg/L	0.03	--	–	19		<0.05	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.050	<0.03	0.04	0.06	<0.03	<0.03
gen as N	mg/L	0.4	--	–	–		--	<0.4	2.3	1.0	--	0.6	1.1	<0.4	0.5	1.1	0.31	<0.4	1.8	0.5	<0.4	0.7
on	mg/L	0.5	--	–	–		4.8	5.8	3.4	4.7	4.0	4.6	7.0	4.3	2.7	4.5	3.1	5.3	5.7	4.4	3.3	7.0
s P)	mg/L	0.01	--	–	–		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.57	6.7	7.1	6.5	6.71	6.93	6.89	6.64	6.84	6.63	6.56	6.90	6.94	6.66	7.16	7.03
	mg/L	0.1	--	–	–		5.79	6.1	6.6	5.9	7.1	5.7	6.4	6.5	7.6	7.0	6500	8.0	4.7	6.3	7.3	8.2
Mg)	mg/L	0.1	--	–	–		1.05	1.0	1.1	1.2	1.0	1.0	1.1	1.4	1.2	1.0	930	1.3	0.9	1.0	1.1	1.3
1M depth)	mg/L	0.002	--	–	–	0.01	0.009	**0.018**	**0.040**	0.006	0.005	**0.013**	**0.010**	**0.010**	**0.026**	**0.14**	0.005	0.005	0.005	0.004	0.004	0.003
)	mg/L	0.1	--	–	–		0.858	0.7	0.9	0.8	0.8	0.7	1.1	0.8	1.1	0.9	720	0.09	0.7	0.7	0.9	1.0
	mg/L	0.1	--	–	–		22.0	34.6	32.0	27.7	33.6	19.2	31.3	37.5	40.3	38.3	33	42.6	28.3	32.5	33.1	33.5
2)	mg/L	0.5	--	–	–		2.5	2.7	2.0	2.4	2.7	2.5	2.5	2.7	2.1	2.5	3.3	1.9	2.2	2.7	2.0	2.3
olids	mg/L	5	--	–	–		1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.0	<5	<5	<5	<5	<5
(SO4)	mg/L	2	--	–	–		9	7	8	8	8	7	8	9	8	8	8	9	8	10	10	10
	NTU	0.1	--	50	–		0.9	1.1	0.7	0.9	0.7	0.8	0.4	1.1	0.4	0.8	0.71	1.0	1.0	0.7	1.3	1.2
)	µS/cm	1	--	–	–		160	215	226	189	232	223	204	228	246	225	220	248	244	208	267	196
eters																					
	me/L	N/A	--	–	–		1.42	2.13	1.95	1.58	1.82	1.52	1.58	2.56	1.50	1.50	1.94	1.95	1.96	1.74	1.94	1.89
lc. as CaCO3)	mg/L	5	--	–	–		9	21	8	<5	<5	6	5	32	<5	<5	5.4	6	7	<5	7	9
	mg/L	1	--	–	–		84	118	111	96	110	82	98	136	106	103	120	124	106	105	114	113
c. as CaCO3)	mg/L	10	--	–	–		<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
	me/L	N/A	--	–	–		1.36	1.94	1.85	1.64	1.94	1.23	1.81	2.12	2.27	2.14	1.87	2.40	1.58	1.86	1.93	2.01
	mg/L	N/A	--	–	–		19	19.3	21.0	19.7	21.8	18.4	20.5	22.0	23.9	21.6	20.0	25.3	15.4	19.8	22.8	25.8
erence)	%	N/A	--	–	–		2.16	4.7	2.6	2.0	3.2	10.6	6.7	9.4	20.3	17.5	1.8	10.2	10.8	3.2	0.4	3.0
20C)	N/A	N/A	--	–	–		-3.06	-2.79	-2.77	-3.62	-3.33	-3.11	-3.19	-2.64	-3.17	-3.42	-3.24	-3.20	-3.13	-3.43	-2.72	-2.69
4C)	N/A	N/A	--	–	–		-3.31	-3.11	-3.09	-3.94	-3.65	-3.43	-3.51	-2.96	-3.49	-3.74	-3.50	-3.34	-3.45	-3.75	-3.04	-3.01
0C)	N/A	N/A	--	–	–		9.63	9.49	9.87	10.1	10.0	10.0	10.1	9.28	10.0	10.0	9.8	9.9	10.1	10.1	9.88	9.72
C)	N/A	N/A	--	–	–		9.88	9.81	10.2	10.4	10.4	10.4	10.4	9.60	10.3	10.4	10.1	10.2	10.4	10.4	10.2	10.0
)	µg/L	5	5	–	5-100		--	**222**	52	**154**	**136**	58	61	**224**	53	**108**	**180**	---	79	**163**	--	--
)	µg/L	2	20	–	–		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	--
	µg/L	2	5.0	–	5		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	--
	µg/L	5	1000	–	–		--	18	16	15	19	9	16	16	17	17	17	---	19	14	--	--
	µg/L	2	5.3	–	–		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	<2
	µg/L	2	--	–	–		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--
	µg/L	5	1200	–	1500		--	6	9	15	7	7	9	7	6	10	<50	---	<5	7	--	--
)	µg/L	0.017	0.01	–	0.017		--	**0.022**	**0.027**	**0.029**	**0.024**	<0.017	**0.034**	**0.036**	<0.017	**0.024**	**0.035**	---	**0.332**	**0.024**	--	--
)	µg/L	1	---	–	1		--	<1	<1	5	<1	<1	<1	**6**	<1	<1	<1.0	---	**7**	<1	--	--
	µg/L	1	10	–	–		--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	---	<1	<1	--	--
	µg/L	1	2	–	2.0-4.0		<2.0	<2	<2	<2	<2	<1	1	<1	<1	5	<2.0	1	<1	<1	<1	<1
	µg/L	50	300	–	300		175	160	78	120	111	70	79	111	<50	119	100	123	158	96	55	88
	µg/L	0.5	1	–	1.0-7.0		--	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	1.9	<0.5	0.5	<0.5	---	<0.5	<0.5	--	--
Mn)	µg/L	2	820	–	–		35.9	30	14	37	35	13	12	40	18	25	34	24	35	23	15	17
(Mo)	µg/L	2	73	–	73		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--
	µg/L	2	25	–	25-150		--	<2	<2	5	<2	<2	<2	2	<2	<2	<2.0	---	3	3	--	--
)	µg/L	1	1.0	–	1		--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	---	<1	<1	--	--
	µg/L	0.1	0.1	–	0.1		--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	---	<0.1	<0.1	--	--
	µg/L	5	21000	–	–		--	27	31	29	31	18	31	31	30	30	29	---	23	28	--	--
	µg/L	0.1	0.8	–	0.8		--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	---	<0.1	<0.1	--	--
	µg/L	2	--	–	–		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--
	µg/L	2	--	–	–		--	3	<2	<2	<2	<2	<2	<2	<2	2	2.3	---	<2	<2	--	--
	µg/L	0.1	300	–	15		--	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	---	0.1	0.1	--	--
	µg/L	2	6	–	–		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--
	µg/L	5	30	–	30		9.3	5	<5	**64**	11	7	5	10	<5	10	14	6	12	10	<5	<5
AL																					
	MPN/100mL	1	--	–	–		--	461	613	93	461	308	461	42	629	>2470	---	356	163	179	517	2420
	MPN/100mL	1	--	400	–		100	14	2	6	6	6	4	<1	1	17	<10	1	2	<1	23	44
	MPN/ml	--	--	400	–		--	--	--	--	--	--	--	--	--	--	---	---	--	--	--	--
lification method	µg/L	0.05	--	–	–		0.91	0.30	1.2	1.09	1.44	2.20	0.64	0.20	0.61	0.9	0.48	1.22	2.71	1.52	1.2	2.32
schmeyer method	µg/L	0.05	--	–	–		0.85	0.33	1.0	1.41	1.59	2.40	0.62	0.20	0.54	0.84	---	1.26	1.44	1.86	1.57	2.34

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009) (Referenced)
Nova Scotia Environment Environmental Quality Standards for Surface Water (Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality
Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

SQs for face Water eference)	Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Highway 102																	
				HWY102-1																	
				2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20
				07:00	12:45	08:00	13:00	10:20	09:00	13:40	11:00	11:00	14:50	11:00	9:50	14:15	12:22	12:30	12:00	10:10	9:30	13:15
--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
--	--	--		11.8	18.8	15.7	14.9	19.6	7.4	11.4	17.8	14.6	10.7	21.8	13.6	11.7	19.5	8.9	12.1	19.6	10.2	14.29
--	--	5.5-9.5		**11.44**	5.80	**4.34**	8.18	**4.25**	6.05	8.15	**3.88**	**5.34**	5.65	**1.03**	**3.83**	7.55	**3.32**	**3.10**	**12.03**	**2.09**	**4.54**	**4.27**
--	5.0-9.0	6.5 - 9.0		7.98	5.35	5.25	6.31	5.26	5.62	5.75	5.77	5.99	8.76	5.73	6.38	6.19	7.10	6.79	6.02	6.63	5.12	6.35
--	--	--		194	153	104	135	106	109	114	108	89	288	225	155.5	226	173.2	234.0	880.0	337	109	0.393
--	--	--		<5	<5	<5	<5	<5	<5	5	11	8	22	25	15	9	23	20	31	28	30	16
--	--	120		24	38	24	32	25	22	24	19	12	58	48	28	53	31	40	65	57	19	**130**
--	--	--		67	68	57	37	89	53	39	65	79	24	65	40	9	65	25	11	31	93	22
--	--	--		<0.05	<0.05	<0.05	0.69	<0.05	1.2	0.69	0.25	1.2	2.61	0.06	0.43	0.51	<0.05	<0.05	<0.05	<0.05	0.53	<0.050
--	--	13000		<0.05	--	--	0.69	<0.05	--	0.69	--	--	2.61	0.06	0.43	0.51	<0.05	<0.05	<0.05	<0.05	0.53	<0.050
--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010
--	--	19		<0.05	0.29	<0.05	<0.05	<0.05	<0.05	0.05	0.1	0.07	0.31	0.19	0.04	<0.03	0.05	0.06	<0.03	0.04	0.03	<0.050
--	--	--		--	--	--	--	--	--	--	--	--	1.1	1.3	0.6	--	0.6	0.6	0.7	0.6	<0.4	0.34
--	--	--		6.5	10	7.7	4.7	11	6.3	4.5	7.2	7.4	5.5	10.0	7.0	5.1	10.1	17.7	4.1	7.7	9.0	2.7
--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010
--	5.0-9.0	6.5 - 9.0		**4.54**	**5.24**	**5.40**	**5.48**	**6.24**	**5.31**	**6.42**	6.55	**6.28**	**6.4**	6.9	6.8	6.86	6.87	6.73	6.56	7.49	**5.90**	6.61
--	--	--		1.7	1.8	1.6	4.93	3.34	5.09	4.9	5.21	5.55	12.5	11.7	7.5	11.1	10.5	13.9	7.2	23.3	2.2	18000
--	--	--		0.3	0.5	0.5	1.08	0.79	1.09	0.91	0.92	1.19	1.7	2.0	1.4	1.4	1.5	2.3	1.6	3.2	0.6	2400
--	--	--	0.01	**0.07**	**0.14**	**0.020**	0.006	0.007	**0.011**	0.009	**0.012**	**0.010**	**0.019**	**0.039**	**0.02**	0.006	**0.021**	**0.022**	**0.013**	**0.038**	**0.03**	0.007
--	--	--		0.5	1.2	0.7	1.140	1.630	1.310	1.100	1.500	1.880	1.6	2.5	1.5	1.3	1.7	2.4	1.2	2.5	0.7	2000
--	--	--		15	25	13	15.9	14.5	14.6	14.8	10.2	8.26	36.3	27.7	14.6	30.8	15.0	20.5	39.1	38.7	18.6	64
--	--	--		2.5	2.2	2.0	1.1	3.8	5.1	2.8	5.2	4.6	4.1	6.1	5.1	3.1	5.1	5.8	1.7	7.1	4.7	2.1
--	--	--		7	80	2	<2	11	<2	<1	1	<1	9	6	<5	<5	<5	<5	6	<5	<5	<1.0
--	--	--		5	3	3	8	<2	8	10	8	10	14	8	9	12	8	12	10	7	6	13
--	50	--		14.0	35	0.9	1.4	1.2	0.6	0.4	0.6	1.1	0.9	1.9	0.9	0.5	1.6	0.5	0.7	1.6	0.9	0.59
--	--	--		100	140	92	130	100	110	110	100	88	263	231	143	243	188	218	252	338	112	470
--	--	--		0.77	1.12	0.73	1.11	0.71	0.88	1.03	0.95	0.80	2.55	2.02	1.31	1.96	1.50	1.78	2.66	2.31	1.30	4.20
--	--	--		<1	<1	<1	<1	<1	<1	5	11	8	22	25	15	9	23	20	31	28	30	16
--	--	--		50	73	45	67	50	63	65	58	54	150	117	73	117	83	104	143	150	68	240
--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0
--	--	--		0.84	1.32	0.74	1.06	0.93	1.02	1.00	0.83	0.80	2.43	6.04	1.19	2.06	1.40	1.87	2.25	3.22	1.04	3.94
--	--	--		6	6	6	17	12	17	16	17	19	38.2	37.5	24.5	33.5	32.4	44.2	24.6	71.4	8.0	55.0
--	--	--		4.35	8.20	0.68	2.30	13.40	7.37	1.48	6.74	0.00	2.6	1.9	4.6	2.4	3.5	2.6	8.4	16.4	11.2	3.19
--	--	--		NC	NC	NC	NC	NC	NC	-3.50	-2.99	-3.36	-2.77	-2.23	-2.72	-2.73	-2.33	-2.41	-2.69	-1.30	-3.85	-2.32
--	--	--		NC	NC	NC	NC	NC	NC	-3.75	-3.25	-3.61	-3.09	-2.55	-3.04	-3.05	-2.65	-2.73	-3.01	-1.62	-4.17	-2.57
--	--	--		NC	NC	NC	NC	NC	NC	9.92	9.54	9.64	9.17	9.13	9.52	9.59	9.20	9.14	9.25	8.79	9.75	8.93
--	--	--		NC	NC	NC	NC	NC	NC	10.20	9.80	9.89	9.49	9.45	9.84	9.91	9.52	9.46	9.57	9.11	10.1	9.18
5	--	5-100		**510**	--	--	**169**	**192**	--	**205**	--	--	**134**	**183**	**146**	86	**145**	**150**	**187**	83	**310**	**51**
20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0
5.0	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0
1000	--	--		22	--	--	52.9	36.9	--	37.3	--	--	58	284	42	57	57	80	46	142	17	130
5.3	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
1200	--	1500		<5	--	--	11.4	10.9	--	<50	--	--	12	18	13	10	10	11	9	14	11	<50
0.01	--	0.017		<0.3	--	--	**0.043**	<0.017	--	**0.023**	--	--	**0.034**	**0.021**	<0.017	<0.017	<0.017	**0.040**	**0.022**	<0.017	**0.022**	**0.024**
1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	**8**	<1	<1	<1.0
10	--	--		<1	--	--	0.50	0.46	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40
2	--	2.0-4.0		2	--	--	3.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	3	<2	<1	2	<1	<1	2	<2.0
300	--	300		**720**	--	--	146	**637**	150	107	209	219	102	**1380**	255	111	**938**	**446**	147	**820**	290	140
1	--	1.0-7.0		1.6	--	--	2.37	0.56	--	<0.50	--	--	<0.5	0.7	<0.5	<0.5	<0.5	0.6	2.6	<0.5	0.6	<0.50
820	--	--		40	--	--	55.3	39.0	67.0	28.1	21.0	31.3	34	79	28	23	45	31	56	122	61	28
73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
25	--	25-150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0
0.1	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
21000	--	--		11	--	--	29.1	19.7	--	24.3	--	--	48	58	36	52	47	62	38	103	13	85
0.8	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
--	--	--		6	--	--	<2.0	<2.0	--	3.5	--	--	<2	3	<2	<2	<2	4	2	<2	<2	<2.0
300	--	15		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
6	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
30	--	30		21	--	--	16.4	6.9	6.9	<5.0	<5.0	6.9	<5	6	<5	<5	<5	10	10	<5	7	11
--	--	--		84	>250	--	>250	>250	180	120	180	--	687	>2420	>2420	1550	>2420	1553	120	>2420	>2420	---
--	400	--		54	**>250**	--	12	17	5	1	78	<100	3	68	145	4	9	5	3	179	3	20
--	400	--		--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
--	--	--		15.40	19.29	0.70	18.12	1.61	8.45	0.93	0.58	0.69	0.53	2.59	0.81	1.27	14.70	1.99	0.25	1.10	1.22	0.5
--	--	--		17.50	19.60	0.84	17.62	1.68	7.52	0.84	0.56	0.65	0.59	2.89	1.05	1.45	15.80	2.20	0.82	1.11	1.38	0.55

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009)

QGs for face Water ference)	Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Highway 102																	
				HWY102-2																	
				2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/14	2014/08/14	2014/10/27	2015/05/20
				12:30	12:15	12:30	12:40	09:30	12:30	11:20	15:00	15:30	11:20	12:20	10:35	10:40	10:00	10:22	12:15	14:25	10:07	11:00
--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	N/A	NCC
--	--	--		16.7	19.2	16.4	17.2	17.0	8.7	10.8	24.2	15.1	7.8	23.7	14.3	11.5	22.0	10.7	11.4	--	10.4	12.7
--	--	5.5-9.5		**10.01**	5.90	**4.80**	**4.91**	**2.45**	**2.99**	6.92	7.03	**5.09**	**3.73**	**13.1**	**3.28**	6.30	**1.57**	**4.20**	**10.50**	--	9.25	**4.24**
--	5.0-9.0	6.5 - 9.0		6.57	5.71	5.40	6.33	5.86	5.64	6.22	5.89	5.29	7.3	6.37	6.72	6.01	6.92	5.40	5.40	--	5.85	6.45
--	--	--		37	457	162	415	167	101.2	92.2	123.1	96	225	226	159.1	288	188.5	204.4	204.4	--	174	0.411
--	--	--		<5	<5	7	6	5	<5	<5	5	<5	17	7	<5	6	14	7	30	--	8	7.5
--	--	120		21	82	83	**170**	41	18	21	21	17	63	109	45	71	50	52	113	--	34	**260**
--	--	--		120	190	91	96	160	68	65	98	77	32	100	70	11	61	36	13	--	85	17
--	--	--		<0.05	<0.05	<0.05	0.10	<0.05	0.62	0.26	1.8	3.2	1.54	<0.05	0.14	0.17	<0.05	<0.05	<0.05	--	0.12	<0.050
--	--	13000		<0.05	--	--	0.10	<0.05	--	0.26	--	--	1.54	<0.05	0.14	0.17	<0.05	<0.05	<0.05	--	0.12	<0.050
--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	<0.010
--	--	19		<0.05	0.06	<0.05	<0.05	0.20	<0.05	<0.05	0.30	0.08	0.09	<0.03	<0.03	<0.03	0.17	0.09	<0.03	--	<0.03	0.056
--	--	--		--	--	--	--	--	--	--	--	--	0.6	1.1	0.5	--	0.7	2.0	15.3	--	<0.4	0.33
--	--	--		8.5	13	13	7.2	14	7.4	5.7	9.2	8.4	7.0	15.8	11.2	6.1	10.6	5.1	17.4	--	8.0	3.0
--	--	--		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.010
--	5.0-9.0	6.5 - 9.0		**5.43**	**5.96**	**6.30**	**6.05**	**6.32**	**5.47**	**5.93**	**6.18**	**5.92**	**5.9**	6.7	6.8	6.61	6.59	**6.34**	7.20	--	**6.40**	**6.12**
--	--	--		1.6	4.0	4.8	7.44	3.84	4.01	3.07	2.22	3.80	7.0	8.4	5.6	7.6	8.5	8.2	14.1	--	9.5	20000
--	--	--		0.4	0.7	0.9	0.96	0.59	1.00	0.68	0.68	1.38	1.2	1.4	1.2	1.2	1.3	2.2	3.1	--	1.8	2500
--	--	--	0.01	**<0.02**	**0.04**	**0.034**	**0.010**	**0.028**	0.003	0.009	**0.019**	**0.041**	**0.021**	**0.054**	**0.03**	**0.014**	**0.028**	**0.199**	**0.028**	--	**0.20**	**0.01**
--	--	--		0.5	0.8	1.1	0.984	0.956	1.390	0.844	1.310	1.880	1.2	1.7	1.6	1.3	1.5	2.5	2.9	--	1.7	1900
--	--	--		15	51	55	83.7	32.0	12.1	13.3	13.1	13.3	41.5	63.6	20.4	39.0	19.1	34.5	69.6	--	24.0	150
--	--	--		2.2	4.4	4.0	3.0	6.4	5.4	2.5	6.5	6.7	4.1	6.9	5.8	1.6	6.2	6.6	1.6	--	5.9	2.3
--	--	--		<2	58	62	34	27	3	<1	10	14	<5	39	<5	<5	<5	194	34	--	<5	2
--	--	--		<2	3	8	11	<2	7	5	5	8	12	6	10	10	9	10	12	--	8	15
--	50	--		0.7	3.8	4.2	2.6	3.1	0.5	0.4	1.2 (1)	3.9	0.6	10.8	2	1.5	3.3	**144**	1.1	--	1.1	1.2
--	--	--		85	290	310	590	160	94	91	100	110	263	403	179	295	203	223	433	--	194	920
--	--	--		0.60	2.37	2.62	5.13	1.27	0.70	0.73	0.91	0.86	2.48	3.34	1.49	2.34	1.88	1.81	4.04	--	1.29	7.88
--	--	--		<1	<1	7	6	5	<1	<1	5	<1	17	7	<5	6	14	7	30	--	8	7.5
--	--	--		42	150	165	282	93	52	48	62	67	143	200	86	135	100	145	235	--	85	460
--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	--	<10	<1.0
--	--	--		0.81	2.65	2.89	4.17	1.81	0.86	0.82	0.83	0.97	2.32	2.10	1.40	2.24	1.50	3.50	4.17	--	1.76	7.87
--	--	--		6	13	16	23	12	14	11	8	15	22.4	26.7	18.9	23.9	26.6	29.5	48.0	--	31.1	59.0
--	--	--		14.90	5.58	4.90	10.30	17.50	10.30	5.81	4.60	6.01	3.3	3.6	3.1	2.3	11.3	31.7	1.6	--	15.1	0.0600
--	--	--		NC	NC	-3.57	-3.72	-3.70	NC	NC	-4.07	NC	-3.63	-3.15	-3.34	-3.33	-2.92	-3.50	-1.80	--	-3.30	-3.18
--	--	--		NC	NC	-3.82	-3.97	-3.95	NC	NC	-4.32	NC	-3.95	-3.47	-3.66	-3.65	-3.24	-3.82	-2.12	--	-3.62	-3.42
--	--	--		NC	NC	9.87	9.77	10.00	NC	NC	10.30	NC	9.53	9.85	10.10	9.94	9.51	9.84	9.00	--	9.70	9.29
--	--	--		NC	NC	10.10	10.00	10.30	NC	NC	10.50	NC	9.85	10.2	10.5	10.3	9.83	10.2	9.32	--	10.0	9.54
5	--	5-100		270	--	--	189	368	--	260	--	--	145	**466**	**259**	**130**	**138**	**2760**	**400**	--	**216**	**100**
20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<1.0
5.0	--	5		<2	--	--	<1.0	2.1	--	<1.0	--	--	<2	<2	<2	<2	<2	6	<2	--	<2	<1.0
1000	--	--		20	--	--	53.1	27.7	--	26.6	--	--	49	74	33	44	43	213	381	--	63	140
5.3	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<1.0
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
1200	--	1500		<5	--	--	7.9	7.8	--	<50	--	--	10	17	15	9	10	13	11	--	12	<50
0.01	--	0.017		<0.3	--	--	0.051	<0.017	--	<0.017	--	--	0.037	**0.031**	**0.032**	**0.019**	<0.017	**0.096**	**0.051**	--	**0.019**	**0.100**
1.0	--	1		<2	--	--	<1.0	1.0	--	<1.0	--	--	<1	<1	<1	<1	1	**9**	**2**	--	<1	<1.0
10	--	--		<1	--	--	0.66	0.77	--	<0.40	--	--	<1	1	1	<1	1	3	1	--	<1	1.8
2	--	2.0-4.0		2	--	--	2.0	<2.0	<2.0	<2.0	2.5	2.8	<2	3	3	<2	1	**12**	4	--	2	<2.0
300	--	300		**880**	--	--	**1380**	**3850**	**303**	229	**897**	**1110**	214	**5210**	**1550**	**383**	**1720**	**28400**	**1660**	--	**485**	**960**
1	--	1.0-7.0		1.9	--	--	1.61	2.70	--	0.59	--	--	<0.5	5.2	2.1	0.6	0.7	19.4	3.5	--	1.0	<0.50
820	--	--		110	--	--	387	135	52.9	40.5	106	176	78	219	207	83	173	327	212	--	93	470
73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
25	--	25-150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	4	2	--	<2	<2.0
1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	--	<1	<1.0
0.1	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.10
21000	--	--		11	--	--	37.4	21.1	--	16.9	--	--	33	45	31	39	40	45	75	--	43	96
0.8	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.10
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
--	--	--		4	--	--	<2.0	6.4	--	4.9	--	--	<2	10	4	4	<2	60	9	--	6	<2.0
300	--	15		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	--	<0.1	<0.10
6	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	2	<2	<2	<2	11	<2	--	<2	<2.0
30	--	30		12	--	--	13.6	12.3	9.3	5.5	9	12.5	<5	7	12	12	<5	**46**	**36**	--	17	27
--	--	--		28	>250	--	>250	75	41	110	>250	--	1553	>2420	>2420	2420	1990	>2420	687	--	>2420	---
--	400	--		4	230	--	9	5	<1	7	**>250**	<100	<1	16	50	111	9	4	<1	--	<1	<10
--	400	--		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
--	--	--		0.90	82.63	48.17	0.85	16.36	0.25	0.97	4.91	1.9	2.07	21.03	0.33	2.41	1.10	21.62	10.34	--	0.46	0.53
--	--	--		0.91	81.20	52.50	0.85	17.35	0.23	0.87	4.49	2.15	2.27	17.26	0.50	3.02	1.30	27.02	11.09	--	0.55	0.58

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Part 6 (September 2009)

LSQS for Surface Water (Reference)	Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Lake Shore Drive																		
				LSD																		
				2009/06/29 12:00	2009/08/13 09:30	2009/10/01 11:45	2010/05/31 09:00	2010/08/24 11:28	2010/11/01 10:00	2011/05/13 08:45	2011/08/14 13:20	2011/10/17 9:00	2012/05/01 9:15	2012/08/15 13:00	2012/10/11 9:10	2013/05/15 08:40	2013/08/15 15:30	2013/10/16 11:55	2014/05/15 9:30	2014/08/14 12:45	2014/10/27 13:30	2015/05/20 09:50
--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	N/A	NCC
--	--	--		13.1	16.7	15.3	13.4	21.3	7.3	10.2	21.0	12.0	5.7	25.7	13.4	7.7	20.2	8.8	8.9	--	10.48	12.52
--	--	5.5-9.5		**10.84**	5.70	5.50	8.60	**5.41**	8.47	9.44	7.87	8.16	**4.06**	**2.69**	7.58	8.77	7.26	7.60	**14.78**	--	7.22	6.26
--	5.0-9.0	6.5 - 9.0		7.88	6.74	6.34	6.42	6.64	6.17	7.09	6.88	6.63	8.22	7.16	6.92	5.19	7.28	6.23	7.02	--	6.31	6.88
--	--	--		723	210	168	218	203	110	146	126	112	62	177.5	116.7	123.6	132.5	147.8	180.0	--	111	0.119
--	--	--		13	16	12	13	21	9	9	15	12	21	14	11	8	20	11	35	--	10	11
--	--	120		41	34	31	49	45	25	38	27	22	22	33	23	39	32	23	29	--	23	32
--	--	--		32	27	37	20	26	33	32	41	49	13	20	40	10	21	25	9	--	31	20
--	--	--		0.14	0.14	0.06	0.23	0.10	0.12	0.25	0.17	0.09	0.13	0.80	<0.05	0.18	0.20	<0.05	0.09	--	0.11	0.15
--	--	13000		0.14	--	--	0.23	0.10	--	0.25	--	--	0.13	0.80	<0.05	0.18	0.20	<0.05	0.09	--	0.11	0.15
--	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	<0.010
--	--	19		<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.06	0.03	<0.03	<0.03	<0.03	0.03	0.03	0.04	--	<0.03	<0.050
--	--	--		--	--	--	--	--	--	--	--	--	0.5	3.5	0.5	--	0.7	3.0	1.0	--	<0.4	0.29
--	--	--		5.0	3.8	6.8	3.7	6.0	5.3	4.7	7.1	7.5	3.1	8.0	7.7	4.7	6.3	6.9	5.2	--	8.1	3.2
--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.010
--	5.0-9.0	6.5 - 9.0		6.69	6.69	6.93	7.10	7.30	6.67	6.72	6.79	6.49	6.2	6.9	6.9	6.94	6.95	**6.49**	**6.47**	--	6.72	7.02
--	--	--		6.5	6.9	5.4	7.99	10.5	5.29	5.9	5.14	5.04	2.6	18.1	5.1	6.4	6.0	5.6	5.4	--	5.1	6100
--	--	--		1.4	1.6	1.3	1.99	2.14	1.15	1.25	1.19	1.23	0.7	3.3	1.4	1.2	1.4	1.6	1.5	--	1.1	1300
--	--	--	0.01	**<0.02**	**0.03**	0.009	**0.018**	**0.100**	0.009	**0.018**	**0.028**	**0.014**	**0.022**	**0.063**	0.003	0.007	**0.015**	**0.078**	**0.100**	--	**0.03**	**0.011**
--	--	--		1.2	1.1	1.3	1.180	1.210	1.030	1.070	0.960	1.240	0.6	1.9	1.3	1.2	1.1	1.4	1.1	--	1.1	1100
--	--	--		24	21	18	24.8	26.9	15.2	23.2	14.3	13.8	11.3	18.6	15.2	21.9	26.6	14.6	23.4	--	18.1	19
--	--	--		3.1	4.2	4.0	3.2	3.4	4.3	2.6	3.9	3.8	3.1	2.9	4.9	2.6	3.9	5.0	2.9	--	4.2	2.4
--	--	--		16	98	5	6	110	7	4	77	5	<5	16	19	<5	17	9	51	--	8	4.6
--	--	--		6	4	5	7	3	4	6	4	4	5	5	5	6	7	5	5	--	4	4.8
--	50	--		0.6	12	2.5	12	6.2	1	0.6	2.5	1.7	6.7	**283**	2.1	1.1	31.6	**82.6**	6.6	--	1.4	1.2
--	--	--		170	150	140	200	200	110	150	130	110	96	161	110	168	136	105	122	--	125	140
--	--	--		1.56	0.82	1.22	1.80	1.77	0.97	1.39	1.14	0.96	1.15	1.37	0.97	1.40	1.46	0.97	1.63	--	0.94	1.22
--	--	--		13	8	12	13	21	9	9	15	12	21	14	11	8	20	11	35	--	10	11
--	--	--		92	55	74	104	107	62	84	66	60	56	163	58	82	87	66	88	--	59	74
--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	--	<10	<1.0
--	--	--		1.53	0.99	1.20	1.69	1.94	1.05	1.44	1.02	1.00	0.76	3.59	1.10	1.43	1.62	1.62	1.52	--	1.19	1.28
--	--	--		22	15	19	28	35	18	20	18	18	9.4	58.8	18.5	20.9	20.7	20.6	19.7	--	17.3	21.0
--	--	--		0.97	9.39	0.83	3.15	4.58	3.96	1.77	5.56	2.04	20.7	63.0	6.1	1.0	5.2	25.0	3.4	--	11.8	2.4
--	--	--		-2.74	-3.20	-2.60	-2.22	-1.71	-2.99	-2.88	-2.64	-3.05	-3.62	-2.30	-2.91	-2.93	-2.55	-3.29	-2.84	--	-3.14	-2.50
--	--	--		-2.99	-3.45	-2.85	-2.47	-1.96	-3.24	-3.13	-2.89	-3.31	-3.94	-2.62	-3.23	-3.25	-2.87	-3.61	-3.16	--	-3.46	-2.75
--	--	--		9.43	9.78	9.53	9.32	9.01	9.66	9.60	9.43	9.54	9.82	9.20	9.81	9.87	9.50	9.78	9.31	--	9.86	9.51
--	--	--		9.68	10.00	9.78	9.57	9.26	9.91	9.85	9.68	9.80	10.10	9.52	10.10	10.20	9.82	10.1	9.63	--	10.2	9.77
5	--	5-100		99	--	--	349	189	--	217	--	--	490	**19200**	**186**	**131**	93	**3420**	**487**	--	**141**	**120**
20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<1.0
5.0	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	**8**	<2	<2	<2	<2	<2	--	<2	<1.0
1000	--	--		14	--	--	15.3	19.2	--	13.9	--	--	11	86	12	12	7	24	15	--	11	12
5.3	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	2	<2	<2	<2	<2	<2	--	<2	<1.0
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
1200	--	1500		13	--	--	41.4	21.6	--	<50	--	--	6	24	16	10	15	15	14	--	16	<50
0.01	--	0.017		<0.3	--	--	0.018	<0.017	--	<0.017	--	--	0.029	**1.050**	**0.023**	<0.017	<0.017	**0.073**	**0.032**	--	<0.017	**0.011**
1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	**11**	<1	<1	<1	**2**	<1	--	<1	<1.0
10	--	--		<1	--	--	<0.40	0.88	--	<0.40	--	--	<1	34	<1	<1	<1	1	<1	--	<1	<0.40
2	--	2.0-4.0		<2	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	**22**	2	<2	1	**12**	2	<1	3	<2.0
300	--	300		180	--	--	**554**	**965**	120	211	**388**	**384**	161	**38900**	**312**	236	254	**4200**	**593**	--	**363**	230
1	--	1.0-7.0		<0.5	--	--	3.02	0.54	--	<0.50	--	--	0.6	**82.4**	<0.5	<0.5	<0.5	5.2	0.5	--	<0.5	<0.50
820	--	--		51	--	--	113	632	22.8	30.2	53.4	38.5	26	**13200**	67	71	81	124	140	--	60	130
73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
25	--	25-150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	13	<2	<2	<2	2	<2	--	<2	<2.0
1.0	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	**2**	<1	<1	<1	<1	<1	--	<1	<1.0
0.1	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.10
21000	--	--		30	--	--	36.3	42.1	--	24.4	--	--	12	82	22	24	24	25	26	--	19	25
0.8	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.10
--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2.0
--	--	--		<2	--	--	7.2	4.1	--	5.3	--	--	3	405	4	<2	2	36	6	--	3	3.3
300	--	15		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	1.6	<0.1	<0.1	<0.1	0.1	<0.1	--	<0.1	<0.10
6	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	30	<2	<2	<2	2	<2	--	<2	<2.0
30	--	30		7	--	--	7.2	6.7	<5.0	<5.0	<5.0	5	<5	**110**	7	6	<5	15	<5	--	<5	<5.0
--	--	--		53	>250	--	>250	>250	280	85	>250	--	1414	>2420	>2420	1990	>2420	>2420	1203	--	8	---
--	400	--		22	24	--	4	45	6	10	**>250**	<100	2	26	10	10	20	2	<1	--	>2420	<10
--	400	--		--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
--	--	--		1.46	10.70	4.68	1.21	6.64	0.21	1.19	1.93	1.41	1.88	6.62	0.13	<0.50	1.6	2.02	1.91	--	0.32	1.02
--	--	--		1.85	11.10	5.62	1.32	7.71	0.19	1.07	1.73	1.18	2.28	7.58	0.22	<0.50	2	2.98	1.91	--	0.33	1.07

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME PAL-F calculation equations). The largest guideline value for each respective element range was always used.
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009)

2016	Units	RDL (May 2016)	ESQs for Surface Water (Reference)	Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Larry Uteck Blvd												
							LU												
	yyyy-mm-dd	--					2011/10/17	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/15	2014/08/14	2014/10/27	2015/05/20	2015/08/25	2015/10/22	2016/05/16	2016/0
	hh:mm	--					10:30	15:20	11:30	10:10	14:30	14:30	13:00	11:45	10:45	9:54	13:45	10:23	10:05	12:20	11:2
	Meters	--	--	1.2	--		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A
	Celsius	0.1	--	--	--		11.3	12.8	27.3	14.6	13.9	18.3	10.9	15.0	22.8	10.2	16.06	23.40	8.20	13.32	21.9
	mg/L	0.01	--	--	5.5-9.5		4.24	6.17	8.2	9.04	10.15	8.29	4.50	11.96	8.08	7.55	7.28	9.49	8.50	8.75	16.6
	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.07	7.82	6.65	6.78	6.39	7.49	5.45	6.50	7.23	6.17	6.57	6.80	6.99	7.17	6.2
ce	uS/cm	1	--	--	--		203	955	480	262	670	320	845.0	999.0	611.0	371.0	0.646	569	436.2	588.0	574
CaCO3)	mg/L	5	--	--	--		12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27
Cl)	mg/L	1	--	--	120		34	224	116	52	190	99	258	243	104	70	210	132	93	154	164
	TCU	5	--	--	--		94	18	14	18	7	7	19	6	8	18	8.4	8	6	17	13
	mg/L	0.05	--	--	--		0.61	1.00	0.64	1.89	1.11	2.57	0.34	1.22	0.47	1.97	0.53	0.59	1.63	1.01	0.47
	mg/L	0.05	--	--	13000		--	1.00	0.64	1.89	1.11	2.57	0.34	1.22	0.47	1.97	0.53	0.59	1.63	1.01	0.47
	mg/L	0.05	--	--	60		--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.06
Nitrogen)	mg/L	0.03	--	--	19		0.06	0.04	0.16	<0.03	<0.03	0.04	0.04	0.05	<0.03	<0.03	<0.050	0.05	<0.03	0.05	0.05
gen as N	mg/L	0.4	--	--	--		--	0.4	4.2	0.7	--	0.5	<0.4	1.2	1.7	<0.4	0.3	8.0	0.7	1.2	1.1
on	mg/L	0.5	--	--	--		11.0	3.7	22.8	4.8	3.1	4.5	2.9	6.9	4.7	4.7	2.2	7.6	6.5	3.9	5.3
P)	mg/L	0.01	--	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.0
	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.43	6.7	7.2	7.2	6.92	7.11	6.49	6.42	7.42	6.41	6.95	7.30	7.15	6.94	7.42
	mg/L	0.1	--	--	--		7.63	30.7	22.1	14.5	22.0	17.6	21.8	23.9	27.6	12.6	27000	20.3	15.9	20.6	17.3
Mg)	mg/L	0.1	--	--	--		2.34	4.2	3.6	2.2	2.8	2.7	4.0	4.2	3.8	2.2	3800	3.4	1.9	2.9	3.4
IM depth)	mg/L	0.002	--	--	--	0.01	0.034	0.043	0.036	0.030	0.006	0.027	0.046	0.260	0.028	0.04	0.007	0.009	0.011	0.029	0.01
	mg/L	0.1	--	--	--		2.110	3.2	3.6	2.5	2.6	2.8	2.9	3.1	3.7	3.0	3300	2.8	1.6	2.8	2.6
	mg/L	0.1	--	--	--		22.7	124	62.2	32.3	95.1	51.7	170	147	88.1	62.7	110	102	57.8	96.4	81.1
2)	mg/L	0.5	--	--	--		6.9	4.9	0.7	6.3	5.1	8.6	7.0	2.1	2.5	6.9	3.6	4.9	6.9	4.2	1.3
olids	mg/L	5	--	--	--		13	5	165	<5	<5	<5	<5	626	<5	<5	<1.0	<5	6	29	<5
(SO4)	mg/L	2	--	--	--		21	26	25	23	26	29	33	29	20	27	27	31	30	28	23
	NTU	0.1	--	50	--		3.3	4.1	23.0	2.3	1.8	1.6	0.7	42.7	10.1	1.6	0.3	2.8	2.4	15.8	3.0
)	µS/cm	1	--	--	--		190	813	482	255	732	433	840	819	605	394	790	575	462	582	739
eters																					
	me/L	N/A	--	--	--		1.69	7.21	4.12	2.36	6.10	4.02	8.13	8.15	3.80	2.68	6.77	4.73	3.62	5.26	5.68
lc. as CaCO3)	mg/L	5	--	--	--		12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27
	mg/L	1	--	--	--		109	426	246	144	347	229	496	477	262	187	400	305	216	321	310
c. as CaCO3)	mg/L	10	--	--	--		<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10
	me/L	N/A	--	--	--		1.70	7.40	4.30	2.43	5.55	3.51	8.90	8.24	5.64	3.64	6.69	5.86	3.52	5.78	4.76
	mg/L	N/A	--	--	--		29	94.0	70.0	45.3	66.5	55.1	70.9	77.0	84.6	40.5	84	64.7	47.5	63.4	56.5
erence)	%	N/A	--	--	--		0.29	1.3	2.2	1.4	4.7	6.8	4.5	0.6	19.4	15.2	0.59	10.6	1.4	4.7	8.8
20C)	N/A	N/A	--	--	--		-2.95	-2.32	-1.94	-2.10	-2.60	-1.93	-2.98	-2.38	-1.45	-3.41	-1.95	-1.82	-2.16	-2.27	-1.5
4C)	N/A	N/A	--	--	--		-3.20	-2.64	-2.26	-2.42	-2.92	-2.25	-3.30	-2.70	-1.77	-3.73	-2.20	-2.14	-2.48	-2.59	-1.8
0C)	N/A	N/A	--	--	--		9.38	9.02	9.14	9.30	9.52	9.04	9.47	8.80	8.87	9.82	8.90	9.12	9.31	9.21	8.9
C)	N/A	N/A	--	--	--		9.63	9.34	9.46	9.62	9.84	9.36	9.79	9.12	9.19	10.1	9.15	9.44	9.63	9.53	9.29
)	µg/L	5	5	--	5-100		--	218	227	252	107	447	31	1400	46	109	59	--	66	1420	--
	µg/L	2	20	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--
	µg/L	2	5.0	--	5		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--
	µg/L	5	1000	--	--		--	225	201	116	133	134	119	185	157	80	150	--	111	127	--
	µg/L	2	5.3	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--
	µg/L	2	--	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--
	µg/L	5	1200	--	1500		--	11	17	22	10	22	18	22	20	21	<50	--	9	14	--
)	µg/L	0.017	0.01	--	0.017		--	0.538	0.171	0.168	0.300	0.236	0.148	0.171	0.031	0.079	0.150	--	0.176	0.426	--
)	µg/L	1	1.0	--	1		--	<1	<1	<1	<1	1	<1	<1	<1	<1	<1.0	--	<1	3	--
	µg/L	1	10	--	--		--	<1	1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	2	--
	µg/L	1	2	--	2.0-4.0		2.9	<2	3	16	2	6	2	2	<1	4	2.1	3	3	10	<1
	µg/L	50	300	--	300		2150	347	1320	500	194	890	157	2000	207	229	170	671	171	1940	374
	µg/L	0.5	1	--	1.0-7.0		--	0.8	0.7	1.0	<0.5	1.4	<0.5	1.8	<0.5	<0.5	<0.50	--	<0.5	3.4	--
Mn)	µg/L	2	820	--	--		129	182	485	120	87	89	26	71	182	36	110	371	61	444	148
(Mo)	µg/L	2	73	--	73		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--
	µg/L	2	25	--	25-150		--	<2	<2	<2	<2	<2	<2	3	<2	<2	<2.0	--	<2	3	--
)	µg/L	1	1.0	--	1		--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--
	µg/L	0.1	0.1	--	0.1		--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--
	µg/L	5	21000	--	--		--	112	94	60	93	90	96	116	111	54	120	--	43	89	--
	µg/L	0.1	0.8	--	0.8		--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--
	µg/L	2	--	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--
	µg/L	2	--	--	--		--	4	3	7	3	11	2	22	<2	3	<2.0	--	<2	31	--
	µg/L	0.1	300	--	15		--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	0.2	--
	µg/L	2	6	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	4	--
	µg/L	5	30	--	30		9	79	92	39	57	49	26	17	8	23	27	17	16	64	7
L																					
	MPN/100mL	1	--	--	--		--	>2420	>2420	2420	866	>2420	866	>2420	961	>2420	---	>2420	>2420	>2420	>242
	MPN/100mL	1	--	400	--		<100	<1	2	19	3	86	<1	<1	7	1730	<10	19	6	<1	40
	MPN/ml	--	--	400	--		--	--	--	--	--	--	--	--	--	--	---	--	--	--	--
ification method	µg/L	0.05	--	--	--		1.99	2.44	32.52	1.80	1.54	2.30	0.12	99.13	2.54	0.96	0.69	3.14	4.94	5.43	4.57
schmeyer method	µg/L	0.05	--	--	--		2.08	2.71	31.31	2.15	1.77	2.50	0.11	98.00	2.51	0.96	0.68	3.10	2.71	6.73	5.23

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME FWAL calculation equations). The largest guideline value for each respective element range was always u
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009)

Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Paper Mill Lake																		
			PML1																		
			2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/15	2014/08/14	2014/10/27	2015/05/20
			13:45	13:00	13:00	13:35	15:15	13:00	13:00	16:50	17:00	12:50	--	10:55	10:51	11:35	10:45	10:30	14:45	12:35	12:45
1.2	--		3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC
--	--		15.7	17.1	16.2	13.2	22.7	9.1	10.3	22.1	13.6	8.3	--	14.9	11.6	22.5	12.3	12.1	23.6	12.4	15.13
--	5.5-9.5		**10.56**	8.10	6.90	8.76	7.83	**10.43**	**10.39**	8.17	**9.54**	8.41	--	8.60	**9.98**	7.65	**9.90**	**12.08**	7.49	8.06	7.16
5.0-9.0	6.5 - 9.0		7.39	6.57	6.64	7.06	7.35	5.89	6.28	6.20	6.11	7.58	--	6.63	6.39	7.20	6.32	6.60	7.42	6.60	6.90
--	--		561	279	223	265	234	125	177	174	106	366	--	186.4	215.1	199.0	250.5	431.0	263.0	210.0	0.197
--	--		6	7	7	7	9	5	6	7	7	20	--	<5	<5	6	7	31	7	7	5.2
--	120		39	64	58	67	61	24	44	43	18	55	--	45	57	57	48	63	50	46	65
--	--		54	15	21	19	12	57	32	38	65	38	--	29	8	15	11	17	10	30	31
--	--		0.49	0.10	0.17	0.42	0.27	0.66	0.55	0.15	0.62	0.22	--	0.14	0.21	0.18	0.18	0.22	0.24	0.18	0.18
--	13000		0.49	--	--	0.42	0.27	--	0.55	--	--	0.22	--	0.14	0.21	0.18	0.18	0.22	0.24	0.18	0.18
--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010
--	19		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.06	--	<0.03	<0.03	0.04	<0.03	0.04	<0.03	<0.03	<0.050
--	--		--	--	--	--	--	--	--	--	--	<0.4	--	0.4	--	0.4	0.8	0.4	0.4	<5	0.49
--	--		6.5	3.6	4.7	0.7	3.3	6.7	4.6	5	8.3	5.7	--	5.3	4.2	4.1	5.1	4.0	2.0	4.4	2.7
--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010
5.0-9.0	6.5 - 9.0		**6.36**	6.75	6.79	6.63	7.04	6.58	6.54	6.83	6.67	6.6	--	6.8	6.71	6.92	6.88	6.66	7.00	6.64	6.67
--	--		4.5	6.9	6.4	8.37	9.02	5.90	6.02	4.99	4.64	6.0	--	6.0	6.8	6.6	6.9	6.9	9.1	7.0	6900
--	--		0.6	1.1	1.0	1.25	1.22	0.82	0.98	0.89	0.85	1.0	--	1.1	1.0	0.9	1.5	1.3	1.4	1.0	970
--	--	0.01	**<0.02**	**<0.02**	0.002	**0.018**	0.002	<0.002	**0.014**	**0.011**	**0.030**	**0.019**	--	**0.03**	0.006	0.007	**0.047**	**0.012**	**0.030**	**0.02**	0.005
--	--		0.9	0.9	0.9	1.160	1.060	1.340	1.230	0.771	1.430	0.8	--	1.0	0.8	1.0	1.5	0.9	1.3	0.9	800
--	--		25	38	34	35.2	40.2	18.4	26.8	22.8	13.7	33.6	--	29.8	35.3	28.5	32.2	38.1	41.6	33.7	35
--	--		4.5	2.6	2.8	3.8	3.4	5.9	3.7	2.6	5.4	2.9	--	3.2	2.8	2.6	2.6	2.5	2.3	2.7	2.4
--	--		<2	3	9	7	<2	<1	1	<2	5	9	--	6	<5	<5	23	6	<5	<5	1
--	--		13	11	11	13	12	12	12	10	12	7	--	10	8	10	10	10	8	8	7.8
50	--		0.4	0.5	0.6	8.2	0.9	0.5	0.6	1	1.2	0.7	--	1	0.7	1.1	19.2	1.4	0.9	1.5	0.45
--	--		170	250	230	260	250	130	180	170	100	214	--	179	227	218	209	230	261	224	240
--	--		1.51	2.18	1.99	2.34	2.15	1.09	1.62	1.56	0.92	2.11	--	1.49	1.79	1.95	1.71	2.62	1.73	1.62	2.11
--	--		6	7	7	7	9	5	6	7	7	20	--	<5	<5	6	7	31	7	7	5.2
--	--		93	129	118	137	134	75	100	90	63	117	--	95	110	109	115	140	117	102	120
--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	--	<10	<10	<10	<10	<10	<10	<10	<1.0
--	--		1.40	2.11	1.89	2.11	2.33	1.20	1.58	1.35	0.95	1.89	--	1.78	2.00	1.69	2.56	2.18	2.45	1.94	1.98
--	--		14	22	20	26	28	18	19	16	15	19.1	--	19.5	21.1	20.2	23.4	22.6	28.5	21.6	21.0
--	--		3.78	1.63	2.58	5.17	4.02	4.80	1.25	7.22	1.60	5.5	--	9.0	5.5	7.0	19.8	9.2	17.0	9.2	3.2
--	--		-3.57	-2.90	-2.94	-2.96	-2.43	-3.25	-3.27	-2.94	-3.13	-2.91	--	-3.31	-3.35	-3.07	-3.03	-2.61	-2.79	-3.26	-3.13
--	--		-3.82	-3.15	-3.19	-3.21	-2.68	-3.50	-3.53	-3.19	-3.38	-3.23	--	-3.63	-3.67	-3.39	-3.35	-2.93	-3.11	-3.58	-3.38
--	--		9.93	9.65	9.73	9.59	9.47	9.83	9.81	9.77	9.80	9.51	--	10.10	10.1	9.99	9.91	9.27	9.79	9.90	9.80
--	--		10.20	9.90	9.98	9.84	9.72	10.10	10.10	10.00	10.10	9.83	--	10.40	10.4	10.3	10.2	9.59	10.1	10.2	10.1
--	5-100		**260**	--	--	**665**	45.9	--	**233**	--	--	**177**	--	**306**	**141**	**103**	**3920**	**305**	**129**	**142**	**140**
--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	<2	<2	<2	<2	<2	<2	<2	<1.0
--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	<2	<2	<2	2	<2	<2	<2	<1.0
--	--		23	--	--	35.3	24.4	--	26.6	--	--	22	--	19	20	12	40	23	23	18	21
--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	<2	<2	<2	<2	<2	<2	<2	<1.0
--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	<2	<2	<2	<2	<2	<2	<2	<2.0
--	1500		8	--	--	11.3	8.6	--	<50	--	--	6	--	9	6	8	9	8	13	11	<50
--	0.017		<0.3	--	--	**0.032**	<0.017	--	<0.017	--	--	<0.017	--	**0.066**	**0.021**	**0.018**	**0.430**	<0.017	**0.020**	<0.017	**0.025**
--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	--	<1	<1	<1	**3**	<1	<1	<1	<1.0
--	--		<1	--	--	0.96	<0.40	--	<0.40	--	--	<1	--	2	<1	<1	9	<1	<1	<1	<0.40
--	2.0-4.0		<2	--	--	2.0	<2.0	<2.0	4.0	<2.0	2.3	<2	--	<2	<2	1	**6**	1	<1	2	<2.0
--	300		140	--	--	**837**	89	161	141	**315**	**528**	137	--	**742**	130	205	**5300**	239	296	182	93
--	1.0-7.0		<0.5	--	--	1.73	<0.50	--	<0.50	--	--	<0.5	--	0.9	<0.5	<0.5	**13.5**	0.9	<0.5	<0.5	<0.50
--	--		17	--	--	142	68.9	41.3	14.4	128	62.4	48	--	214	33	58	693	54	260	49	34
--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	<2	<2	<2	<2	<2	<2	<2	<2.0
--	25-150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	2	<2	<2	9	<2	<2	<2	<2.0
--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	--	<1	<1	<1	<1	<1	<1	<1	<1.0
--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
--	--		18	--	--	36.3	37.1	--	25	--	--	26	--	30	31	25	34	35	37	30	32
--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	<2	<2	<2	<2	<2	<2	<2	<2.0
--	--		<2	--	--	7.8	<2.0	--	3.9	--	--	<2	--	4	<2	<2	65	4	<2	3	<2.0
--	15		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	0.1	--	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.10
--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	<2	<2	<2	10	<2	<2	<2	<2.0
--	30		8	--	--	10.0	5.4	5.7	6.3	6.2	5.4	<5	--	13	8	<5	**62**	<5	<5	6	11
--	--		200	73	--	>250	>250	>250	85	>250	--	411	--	2420	866	1730	1011	613	2420	>2420	---
400	--		33	45	--	19	**>250**	2	2	34	<100	2	--	20	12	4	6	6	10	10	<10
400	--		--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
--	--		0.62	2.31	0.57	0.82	1.12	0.07	2.85	0.86	0.15	1.03	--	0.69	1.17	1.10	5.07	0.67	0.64	0.91	0.57
--	--		0.64	2.21	0.64	0.74	1.04	0.06	2.75	0.76	0.15	1.10	--	0.91	1.37	1.10	6.39	0.65	0.65	0.87	0.54

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME FWAL calculation equations). The largest g
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009) (Referenced)

	Recreational Water Quality (Reference)	Guideline PAL-F (Applied)	Phosphorus Trigger Range (Applied)	Paper Mill Lake																	
				PML2																	
				2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/15	2014/08/14	2014/10/27	2015/05/20
				13:15	13:40	13:45	14:30	16:20	13:00	12:40	16:20	16:15	13:16	--	--	13:40	10:45	11:20	11:00	9:20	8:30	11:30
	1.2	--		2.8	2.2	2.3	N/A	3.0	2.0	2.2	2.3	2.2	2.35	--	--	3.20	--	N/A	N/A	N/A	3.1	NCC
	--	--		14.8	24.2	19.7	17.8	25.3	10.1	10.9	23.1	15.2	11.6	--	--	14.8	--	12.6	14.4	21.1	12.1	15.09
	--	5.5-9.5		10.20	8.30	8.40	8.78	8.09	10.58	9.88	8.7	8.94	7.75	--	--	9.26	--	8.90	12.44	6.95	7.92	8.06
	5.0-9.0	6.5 - 9.0		6.36	6.82	6.84	7.09	7.39	6.53	6.31	6.67	6.13	8.61	--	--	6.49	--	6.13	6.50	7.22	5.92	6.56
	--	--		267	264	241	237	234	201	159	173	156	231	--	--	234	--	250.5	966.0	266.0	215.0	0.214
	--	--		5	7	7	6	8	7	<5	8	7	21	--	--	<5	--	8	32	10	26	<5.0
	--	120		63	63	58	62	58	50	44	43	34	55	--	--	63	--	64	245	50	42	69
	--	--		22	17	19	20	13	23	35	38	48	39	--	--	18	--	8	6	7	31	26
	--	--		0.14	0.07	0.09	0.19	0.11	0.23	0.33	0.14	0.22	0.24	--	--	0.22	--	<0.05	0.13	0.18	0.18	0.11
	--	13000		0.14	--	--	0.19	0.11	--	0.33	--	--	0.24	--	--	0.22	--	<0.05	0.13	0.18	0.18	0.11
	--	60		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	--	--	<0.05	--	<0.05	<0.05	<0.05	<0.05	<0.010
	--	19		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	--	--	0.03	--	0.23	0.05	0.03	<0.03	<0.050
	--	--		--	--	--	--	--	--	--	--	--	<0.4	--	--	--	--	1.7	<0.4	0.4	<5	0.23
	--	--		3.6	2.6	4.5	3.2	3.4	3.6	4	6	5.6	5.9	--	--	4.4	--	4.0	2.7	2.4	5.8	2.8
	--	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.010
	5.0-9.0	6.5 - 9.0		6.50	6.81	6.82	6.66	7.02	6.83	6.37	6.60	6.60	6.6	--	--	6.68	--	6.73	7.13	7.04	6.77	6.64
	--	--		6.1	7.1	6.1	7.17	7.69	7.96	5.30	4.76	5.04	6.1	--	--	6.7	--	7.7	19.2	8.8	6.9	7300
	--	--		1.1	1.1	1.1	1.25	1.17	1.20	0.93	0.86	0.90	1.0	--	--	1.0	--	1.4	1.7	1.4	1.0	1000
	--	--	0.01	<0.02	<0.02	0.002	0.010	0.002	<0.002	0.009	0.009	0.007	0.025	--	--	0.006	--	0.026	0.011	0.026	0.02	0.008
	--	--		0.9	1.0	0.9	0.984	0.900	1.020	0.861	0.801	0.968	0.8	--	--	0.8	--	1.3	1.4	1.2	1.1	830
	--	--		35	40	34	31.1	35.1	30.8	25.7	21.3	20.9	34.6	--	--	37.5	--	42.0	133	42.6	33.9	38
	--	--		2.6	2.5	2.3	2.6	2.3	3.3	2.9	2.5	3	2.8	--	--	2.7	--	4.2	2.4	2.3	2.9	1.9
	--	--		2	3	<1	15	<2	11	<1	8	<1	<5	--	--	<5	--	<5	16	<5	<5	1
	--	--		11	11	11	10	10	10	9	10	9	7	--	--	9	--	11	27	7	7	8
	50	--		0.8	0.7	0.6	1.0	0.8	0.4	0.4	3.4	0.5	0.7	--	--	1	--	3.3	2.6	0.7	1	0.88
	--	--		240	250	230	230	230	210	170	170	150	213	--	--	254	--	277	777	273	212	260
	--	--		2.11	2.17	1.99	2.07	2.01	1.77	1.46	1.58	1.30	2.13	--	--	1.98	--	2.19	8.12	1.77	1.86	2.13
	--	--		5	7	7	6	8	7	<1	8	7	21	--	--	<5	--	8	32	10	26	<1.0
	--	--		123	131	117	120	120	110	91	89	79	119	--	--	119	--	137	448	118	109	130
	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	--	--	<10	--	<10	<10	<10	<10	<1.0
	--	--		1.94	2.23	1.88	1.88	2.03	1.86	1.48	1.28	1.27	1.94	--	--	2.09	--	2.55	6.96	2.47	1.95	2.14
	--	--		20	22	20	23	24	25	17	15	16	19.3	--	--	20.8	--	25.0	54.9	27.7	21.3	23.0
	--	--		4.20	1.36	2.84	4.81	0.50	2.48	0.68	10.50	1.17	4.8	--	--	2.8	--	7.5	7.7	16.5	2.2	0.23
	--	--		-3.33	-2.83	-2.93	-3.06	-2.55	-2.80	NC	-3.18	-3.17	-2.89	--	--	-3.39	--	-3.08	-1.73	-2.61	-2.57	NC
	--	--		-3.59	-3.08	-3.18	-3.31	-2.80	-3.05	NC	-3.43	-3.42	-3.21	--	--	-3.71	--	-3.40	-2.05	-2.93	-2.89	NC
	--	--		9.83	9.64	9.75	9.72	9.57	9.63	NC	9.78	9.77	9.49	--	--	10.1	--	9.81	8.86	9.65	9.34	NC
	--	--		10.10	9.89	10.00	9.97	9.82	9.88	NC	10.00	10.00	9.81	--	--	10.4	--	10.1	9.18	9.97	9.66	NC
	--	5-100		130	--	--	1030	55.8	--	202	--	--	189	--	--	131	--	107	181	52	122	130
	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<1.0
	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<1.0
	--	--		16	--	--	23.0	12.2	--	23	--	--	22	--	--	22	--	37	50	27	19	25
	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<1.0
	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<2.0
	--	1500		5	--	--	8.2	8.8	--	<50	--	--	6	--	--	6	--	9	7	13	11	<50
	--	0.017		<0.3	--	--	0.037	<0.017	--	0.028	--	--	0.023	--	--	0.039	--	0.060	0.062	0.019	0.018	0.023
	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	--	--	<1	--	<1	<1	<1	<1	<1.0
	--	--		<1	--	--	0.65	<0.40	--	<0.40	--	--	<1	--	--	<1	--	2	<1	<1	<1	<0.40
	--	2.0-4.0		<2	--	--	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2	--	--	<2	--	1380	1	<1	2	<2.0
	--	300		100	--	--	1090	151	76	143	699	181	178	--	--	181	--	1760	264	316	134	170
	--	1.0-7.0		<0.5	--	--	2.39	<0.50	--	<0.50	--	--	<0.5	--	--	<0.5	--	49.7	0.7	<0.5	<0.5	<0.50
	--	--		58	--	--	159	81.0	28.0	33.8	88.6	30.6	22	--	--	87	--	866	206	278	24	43
	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<2.0
	--	25-150		2	--	--	2.2	<2.0	--	<2.0	--	--	<2	--	--	<2	--	3	<2	<2	<2	<2.0
	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	--	--	<1	--	<1	<1	<1	<1	<1.0
	--	0.1		<0.5	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	--	--	<0.1	--	0.1	<0.1	<0.1	<0.1	<0.10
	--	--		30	--	--	34.7	32.8	--	25.7	--	--	27	--	--	31	--	35	68	37	29	34
	--	0.8		<0.1	--	--	<0.10	<0.10	--	<0.10	--	--	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.10
	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	--	<2	--	3	<2	<2	<2	<2.0
	--	--		<2	--	--	21.3	<2.0	--	3.6	--	--	<2	--	--	<2	--	2	3	<2	<2	2.1
	--	15		<0.1	--	--	0.10	<0.10	--	<0.10	--	--	0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.10
	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	--	--	<2	--	<2	<2	<2	<2	<2.0
	--	30		12	--	--	18.3	<5.0	5.8	6.6	7.5	10	8	--	--	11	--	762	<5	<5	5	14
	--	--		49	40	--	>250	46	97	64	>250	--	261	--	--	1410	--	411	291	517	>2420	---
	400	--		10	31	--	69	<1	6	17	>250	<100	1	--	--	12	--	2	<1	3	16	<0.10
	400	--		--	--	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
	--	--		1.15	1.36	0.59	3.50	1.54	0.53	0.55	2.48	1.33	0.76	--	--	1.18	--	0.25	0.99	0.48	0.72	1.67
	--	--		1.22	1.33	0.66	3.39	1.51	0.42	0.51	2.26	1.13	0.76	--	--	1.34	--	0.27	1.13	0.44	0.7	1.56

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (updated 2011)
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness (CCME FWAL calculation equations). The largest g
Health Canada Guidelines for Canadian Recreational Water Quality - Draft (September 2009)

7 STATISTICAL PRESENTATION

Table 4 attached at the end of this section provides seasonal (i.e. fall) statistics for each of the eleven (11) water quality sampling stations representing water quality data from 2009 to October 2016 for six (6) key water quality parameters as follows:

a. Total Phosphorous
b. Chloride
c. Laboratory measured pH
d. Total Suspended Solids
e. Conductivity
f. Chlorophyll-A

TABLE 4: Fall 2016 Statistical Presentation of Key Water Quality Parameters - Bedford West Water Quality Sampling Program

Station 1

KL-1	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.008	0.002	0.013	0.008	0.008
Chloride (mg/L)	45	33.00	64.00	49.00	49.88
Lab pH	6.81	6.35	6.99	6.80	6.74
Total Suspended Solids (mg/L)	<5	1.00	5.00	5.00	4.00
Conductivity (uS/cm)	161	140.00	250.00	221.00	208.50
Chlorophyll-A (µg/L)	2.08	0.84	2.08	1.28	1.36

Station 2

KL-2	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.013	0.008	0.029	0.013	0.016
Chloride (mg/L)	30	10.00	48.00	13.00	19.38
Lab pH	6.19	6.05	6.85	6.24	6.30
Total Suspended Solids (mg/L)	<5	1.00	103.00	5.00	17.75
Conductivity (uS/cm)	125	54.00	212.00	69.50	93.75
Chlorophyll-A (µg/L)	0.32	0.07	1.97	0.44	0.64

Station 3

KL-3	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.004	0.002	0.148	0.006	0.024
Chloride (mg/L)	49	37.00	60.00	47.50	49.00
Lab pH	6.93	6.38	6.94	6.87	6.79
Total Suspended Solids (mg/L)	<5	1.00	5.00	5.00	3.50
Conductivity (uS/cm)	185	160.00	240.00	210.00	205.63
Chlorophyll-A (µg/L)	2.29	0.51	2.29	1.21	1.16

Station 4

KL-4	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.007	0.002	0.026	0.007	0.010
Chloride (mg/L)	49	37.00	60.00	48.50	49.38
Lab pH	6.89	6.46	6.97	6.85	6.82
Total Suspended Solids (mg/L)	10	1.00	10.00	5.00	4.25
Conductivity (uS/cm)	185	160.00	250.00	211.00	208.13
Chlorophyll-A (µg/L)	2.18	0.40	2.18	1.05	1.02

Note: When calculating the minimum, maximum, media and average, SNC-Lavalin Inc sets the reported values that are less than the laboratory detection limit "<RDL" (i.e. Total Phosphorus, Total Suspended Solids, etc.) to the value of the "RDL". This allows the minimum, maximum, media and average to take into account all data points resulting in a conservative approach.

Station 5

KL-5	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.003	0.003	0.135	0.008	0.028
Chloride (mg/L)	53	37.00	58.00	47.50	48.17
Lab pH	7.03	6.50	7.03	6.76	6.76
Total Suspended Solids (mg/L)	<5	1.00	5.00	5.00	4.33
Conductivity (uS/cm)	196	160.00	244.00	200.00	203.00
Chlorophyll-A (µg/L)	2.32	0.64	2.71	1.00	1.43

Station 6

HWY102-1	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.009	0.002	0.031	0.016	0.016
Chloride (mg/L)	35	12.00	49.00	26.00	28.63
Lab pH	6.45	5.31	6.80	6.37	6.21
Total Suspended Solids (mg/L)	<5	1.00	5.00	5.00	3.75
Conductivity (uS/cm)	167	88.00	244.00	127.50	146.75
Chlorophyll-A (µg/L)	0.33	0.33	8.45	0.76	1.82

Station 7

HWY102-2	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.012	0.003	0.201	0.032	0.067
Chloride (mg/L)	48	17.00	83.00	46.50	46.88
Lab pH	6.15	5.47	6.80	6.24	6.20
Total Suspended Solids (mg/L)	<5	3.00	194.00	9.50	37.88
Conductivity (uS/cm)	177	94.00	315.00	186.50	200.25
Chlorophyll-A (µg/L)	0.43	0.25	48.17	1.18	9.93

Station 8

LSD	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.012	0.003	0.095	0.013	0.031
Chloride (mg/L)	31	22.00	31.00	24.00	25.50
Lab pH	6.38	6.38	6.93	6.68	6.66
Total Suspended Solids (mg/L)	15	5.00	69.00	8.50	17.13
Conductivity (uS/cm)	133	105.00	140.00	117.50	121.13
Chlorophyll-A (µg/L)	0.38	0.13	5.12	0.90	1.78

Note: When calculating the minimum, maximum, media and average, SNC-Lavalin Inc sets the reported values that are less than the laboratory detection limit "<RDL" (i.e. Total Phosphorus, Total Suspended Solids, etc.) to the value of the "RDL". This allows the minimum, maximum, media and average to take into account all data points resulting in a conservative approach.

Station 9

LU	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.012	0.011	0.046	0.032	0.029
Chloride (mg/L)	92	34.00	258.00	81.00	99.83
Lab pH	6.96	6.41	7.20	6.73	6.77
Total Suspended Solids (mg/L)	<5	5.00	13.00	5.00	6.50
Conductivity (uS/cm)	371	190.00	840.00	382.50	418.67
Chlorophyll-A (µg/L)	1.55	0.12	4.94	1.68	1.89

Station 10

PML1	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.013	0.002	0.047	0.020	0.020
Chloride (mg/L)	50	18.00	58.00	47.00	43.13
Lab pH	6.87	6.58	6.88	6.80	6.76
Total Suspended Solids (mg/L)	18	1.00	23.00	6.00	9.13
Conductivity (uS/cm)	189	100.00	241.00	199.00	187.75
Chlorophyll-A (µg/L)	1.7	0.07	5.07	0.80	1.73

Station 11

PML2	Seasonal Results	Seasonal Minimum	Seasonal Maximum	Seasonal Median	Seasonal Mean
Total Phosphorous (µg/L)	0.005	0.002	0.026	0.007	0.010
Chloride (mg/L)	50	34.00	64.00	50.00	50.71
Lab pH	6.93	6.60	6.98	6.82	6.81
Total Suspended Solids (mg/L)	<5	1.00	11.00	5.00	4.71
Conductivity (uS/cm)	190	150.00	277.00	212.00	216.43
Chlorophyll-A (µg/L)	2.02	0.25	2.02	0.72	0.99

Note: When calculating the minimum, maximum, media and average, SNC-Lavalin Inc sets the reported values that are less than the laboratory detection limit "<RDL" (i.e. Total Phosphorus, Total Suspended Solids, etc.) to the value of the "RDL". This allows the minimum, maximum, media and average to take into account all data points resulting in a conservative approach.

8 GRAPHS

Appendix E includes seasonal (i.e. fall event) and yearly graphs that illustrate concentrations from Year 2009 to 2016 of key water quality parameters listed below at each of the eleven (11) water quality monitoring sites. The graphs allow for comparison between water quality sampling stations and identification of concentration increases (i.e. above applicable CCME guidelines):

- Dissolved chloride (mg/L),
- pH,
- Total phosphorus (mg/L),
- Total suspended solids (mg/L),
- Conductivity (µS/cm) and
- Chlorophyll A (µg/L)

As many parameters show seasonal concentration fluctuations, the data were also graphed showing only the concentrations for a given season (i.e. fall in this report). Where results were found to be less than the recordable detection limit (<RDL), they were graphed as half the recordable detection limit ($^1/_2$ RDL).

9 CONCLUSIONS

The fall 2016 water quality monitoring program included collection of surface water samples at eleven (11) water quality sampling stations for the analysis of general chemistry, total metals, total phosphorus, total suspended solids, *E.coli*, and chlorophyll-A. Additionally, field parameters collected at each station included in Situ pH, water temperature, dissolved oxygen, conductivity, Secchi depth (where applicable), air temperature, cloud cover and wildlife sightings.

Based on the fall 2016 water quality monitoring results and their comparison with applicable guidelines, the following results were obtained:

TOTAL PHOSPHOROUS

It was above the management threshold criteria of 10 µg/L (0.01 mg/L) at five stations: KL2 (0.013 mg/L), HWY 102-2 (0.012 mg/L), LSD (0.012 mg/L), LU (0.012 mg/L) and PML-1 (0.013 mg/L)

FIELD PARAMETERS

Dissolved Oxygen was above the CCME PAL-F recommended range of 5.5 - 9.5 mg/L at seven stations: KL1 (12.06 mg/L), KL2 (9.65 mg/L), KL3 (11.41 mg/L), KL4 (10.11 mg/L), KL5 (9.92 mg/L), PML1 (12.96 mg/L) and PML2 (10.31 mg/L)

pH (in Situ) was outside the CCME-PAL-F recommended range of 6.5 - 9.0 pH at ten stations: as follows KL1 (6.23 pH), KL2 (5.54 pH), KL3 (5.58 pH), KL4 (6.14 pH), KL5 (5.72 pH), HWY102-1 (5.69 pH), HWY102-2 (5.36 pH), LSD (6.25 pH), LU (6.23 pH), and PML2 (5.37 pH). In addition, one (1) station, PML1 (4.63 pH) reading was outside the Health Canada Guideline for Recreational Water Quality of 5.0 - 9.0 pH

GENERAL CHEMISTRY

pH (Lab) was outside the CCME-PAL-F recommended range of 6.5 - 9.0 pH at four stations: KL2 (6.19 pH), HWY102-1 (6.45 pH), HWY102-2 (6.15 pH) and LSD (6.38 pH)

METALS

Total Iron exceeded the CCME-PAL-F recommended limit of 300 µg/L at two stations: HWY102-2 (375 µg/L) and LSD (303 µg/L)

Total Zinc exceeded the CCME-PAL-F recommended limit of 30 µg/L at station LU (52 µg/L).

MICROBIOLOGICAL

E.coli analytical results did not report exceedances of the Heath Canada Guideline of 400CFU/100mL in any of the eleven (11) stations.

10 REFERENCES

Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, 2004, "Phosphorous: Canadian Guidance Framework for the Management of Freshwater Systems".

Canadian Council of Ministers of the Environment (CCME) guidelines for the Protection of Aquatic Life – Freshwater (FWAL). For TSS and turbidity, the CCME Narrative Total Particulate Matter – Table 1 Suspended Sediments and Turbidity, High Flow Conditions, updated 2002 were used.

Environment Canada (EC), 2005, The Inspector's field sampling manual. Second Edition. Retrieved on March 6, 2015 from http://publications.gc.ca/collections/Collection-R/En40-498-2005-1E.pdf

Health Canada guidelines for Canadian Recreational Water Quality (2012, Third Edition). For turbidity, the guidelines indicate a limit of 50 Nephelometric Turbidity Units (NTU).

Nova Scotia Environment (NSE), Environmental Quality Standards for Surface Water (Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2014) Table A2 Reference for Pathway Specific Standards for Surface Water (µg/L) – Fresh Water

11 LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SNC-Lavalin Inc (SNCL) for Halifax Regional Municipality (HRM), hereafter referred to as the “Client”. It is intended for the sole and exclusive use of Halifax Regional Municipality.

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This report has been prepared in a manner generally accepted by professional consulting principles and practices for the same locality and under similar conditions. No other representations or warranties, expressed or implied, are made.

Opinions and recommendations contained in this report are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, stations, time frames and project parameters as outlined in the Scope or Work and agreement between SNCL and the Client. The data reported, findings, observations and conclusions expressed are limited by the Scope of Work. SNCL is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. SNCL does not warranty the accuracy of information provided by third party sources.

SNC·LAVALIN

Appendix A

Instrument Calibration Report - Fall 2016

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

6380 Tomken Road, Unit 1 & 2
Mississauga, ONTARIO L5T1Y4
Toll-free: (866) 688-0388

Pine Environmental Services, Inc.

Instrument ID 25680
Description YSI Professional Plus
Calibrated 10/21/2016 3:14:11PM

Manufacturer YSI
Model Number PRO PLUS
Serial Number/ Lot Number 13J102030
Location Ontario
Department

State Certified
Status Pass
Temp °C 20.6
Humidity % 55

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.00	7.00	0.00%	Pass
4.00 / 4.00	PH	4.00	PH	4.00	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.00	10.00	0.00%	Pass

Group # 2
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.413	1.413	0.00%	Pass

Group # 3
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	240.00	240.00	0.00%	Pass

Group # 4
Group Name Disolved Oxygen Span
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	100.00	100.00	0.00%	Pass

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

6380 Tomken Road, Unit 1 & 2
Mississauga, ONTARIO L5T1Y4
Toll-free: (866) 688-0388

Pine Environmental Services, Inc.

Instrument ID 25680
Description YSI Professional Plus
Calibrated 10/21/2016 3:14:11PM

Test Instruments Used During the Calibration (As Of Cal Entry Date)

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
ON WQ_DO%-100_ 0000	Dissolved Oxygen 100% AIR	Pine	000	0000		
ON_CAA_H2O _ THERMOMET ER:	Traceable Lollipop Shockproof/Waterproof Thermometer, 8" Stem, -58 to 572 degree F, -50 to 300 degre	Control Company	14-648-44			
ON_CAA_H2O _COND. 1413: 6GH648	Conductivity Standard 1.413 mS/cm (1413 µS/cm)	AquaPhoenix Scientific	31986	6GH648	8/25/2016	8/30/2017
ON_CAA_H2O _DO.Z: 2014041401	Sodium Sulfite, Anhydrous_Na2SO3	Pine	14547_S07710	2014041401	8/25/2016	7/17/2017
ON_CAA_H2O _HYDROMETE R_027580	EdgeTech Dew Prime II Hydrometer	Pine	DewPrime II	027580		
ON_CAA_H2O _ORP 240: 9099	ORP Standard 240 mV	Hanna	HI 7021	9099	8/25/2016	1/30/2020
ON_CAA_H2O _PH10: 6GG626	Buffer Solution, pH 10.00 +/- 0.01 @ 25°C	AquaPhoenix Scientific	32034	6GG626	8/25/2016	7/30/2018
ON_CAA_H2O _PH4: 6GG264	Buffer Solution, pH 4.00 +/- 0.01 @ 25°C	AquaPhoenix Scientific	32017	6GG264	8/25/2016	7/30/2018
ON_CAA_H2O _PH7: 6GG807	Buffer Solution, pH 7.00 +/- 0.01 @ 25°C	AquaPhoenix Scientific	32025	6GG807	8/25/2016	7/30/2018
ON_CAA_IAQ-CALC_56060497	TSI IAQ-CALC 8762	Tsi	8762	56060497		

Notes about this calibration

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Description YSI Professional Plus
Calibrated 10/21/2016 3:14:11PM

NIST Traceable Thermometer Serial No: 122549157
NIST Traceable Thermometer Reading °C: 18.2
YSI Pro plus Temperature Reading °C: 17.80

Amount of Saturated Dissolved Oxygen (D.O) in H2O
H2O Temperature in °C = 18.2
DO Value in mg/L = 9.18
YSI ProPro DO in mg/L = 9.18
Solution Lot#: 2011030423
YSI Pro Plus Range: 0.00-0.19 mg/L
YSI Pro Plus Temperature Reading mg/L: 0.00

Sodium Sulphite (Na2SO3) Dissolved Oxygen (D.O) Zero

Calibration Result Calibration Successful
Who Calibrated Kevin Grant

All instruments are calibrated by Pine Environmental Services, LLC. according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services, LLC. of any defect within 24 hours of receipt of equipment
Please call 866-960-7463 for Technical Assistance

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Appendix B

Field Reports - Fall 2016

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Kearney Lake		**Site ID: KL1**
Watercourse: Kearney Lake		**Location:** Kearney Lake Road
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0445718E, 4948496N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover :	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Off Kearney Lake Road
Site Access Detail:	Sample taken off the end of dock at Kearney Lake beach. Parked in public parking of Hamshaw Dr. and walked down to beach area.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	1: 20 pm
Sample Depth (m):	0.15
pH:	6.23
Dissolved Oxygen (mg/L):	12.06
Secchi Depth (m):	2.5 meters (26/10/2016)
Water Temperature (degrees Celsius):	11.9
Conductivity (µs/cm):	212.4

Additional Comments / Notes

Secchi depth was depth to bottom.

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Kearney Lake		**Site ID: KL2**
Watercourse: Kearney Lake		**Location:** Kearney Lake Road
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0443942E, 4949803N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Off Colin's Rd.
Site Access Detail:	Sample taken on the lake side of the culvert between residential buildings 20 and 28. Walked down rock to left of culvert. Note: Sample when standing downstream of bottle.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	12:50 pm
Sample Depth (m):	0.15
pH:	5.54
Dissolved Oxygen (mg/L):	9.65
Secchi Depth (m):	___1.85___ meters (26/10/2016)
Water Temperature (degrees Celsius):	10.2
Conductivity (µs/cm):	103.7

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Kearney Lake Run	**Site ID: KL3**	
Watercourse: Kearney Lake Run	**Location:** Kearney Lake Road	
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0444390E, 4950406N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Off walking trail from Amesbury Gate Rd.
Site Access Detail:	Access to site is via a walking path clearly evident off of Amesbury Gate Rd. (off Larry Uteck Blvd.) roughly 205m down road on left. Walk down path, follow gravel walkway down hill and take sample at the low point facing the dam. Look for large rock outcrop on right.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	11:00 am
Sample Depth (m):	0.15
pH:	5.58
Dissolved Oxygen (mg/L):	11.41
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	12.5
Conductivity (µs/cm):	227.8

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Kearney Lake Run		**Site ID: KL4**
Watercourse: Kearney Lake Run		**Location:** Kearney Lake Road
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0444463E, 4950571N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Via the extended road at the end of Weybridge Ln.
Site Access Detail:	At Weybridge, go to end of extended road on right and walk and take sample above the rocky area at the base of the wider, slow moving section of the river.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	11:11 am
Sample Depth (m):	0.15
pH:	6.14
Dissolved Oxygen (mg/L):	10.11
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	12.3
Conductivity (µs/cm):	228

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 9
Client:	Halifax Regional Municipality	
Site: Kearney Lake		**Site ID: KL5**
Watercourse: Kearney Lake		**Location:** Kearney Lake Road
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 4949142E, 445280N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Along Kearney Lake Road
Site Access Detail:	Easily accessible, sample location is directly off the Kearney Lake Road on a rocky outcrop supporting a power line pole (two pole structure). Slow truck down carefully, turn hazard lights on. Samples were taken on left front of outcrop facing lake.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	1:05 pm
Sample Depth (m):	0.15
pH:	5.72
Dissolved Oxygen (mg/L):	9.92
Secchi Depth (m):	4.20 meters (26/10/2016)
Water Temperature (degrees Celsius):	12.7
Conductivity (µs/cm):	243.2

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Highway 102	**Site ID: HWY 102-1**	
Watercourse: Marsh area	**Location:** Highway 102, south of exit 3	
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0444708E, 4951644N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Off Highway 102 Park before guardrail.
Site Access Detail:	Carefully slow truck down while pulling off highway 102. Park truck with hazard lights on before the start of the guardrail. Walk along outside of guardrail (for approximately 150m). Site is on right fed by a swampy bog area. Samples were taken in front of culvert. There is a concrete pad to step on to take samples. Sample while standing downstream.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	10:20 am
Sample Depth (m):	0.15
pH:	5.69
Dissolved Oxygen (mg/L):	7.35
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	9.2
Conductivity (µs/cm):	208.9

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Highway 102	**Site ID: HWY 102-2**	
Watercourse: Marsh area	**Location:** HWY 102, south of exit 3	
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0444829E, 4951778N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Off Highway 102 (Small gravel drive way- *Back in)
Site Access Detail:	Travel along Highway 102 toward Bedford NS. Site is on right easily to identify based on swamp/bog. Carefully slow truck down with hazard lights flashing. There is a small driveway to park truck. Pull a head of driveway and when lanes are clear back truck down into spot. Take samples in water body in front of culvert.

Field Parameter Data

	Remarks
Date (d.m.y:	25/10/2016
Time (hh:mm):	10:40 am
Sample Depth (m):	0.15
pH:	5.36
Dissolved Oxygen (mg/L):	6.80
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	10.2
Conductivity (µs/cm):	219.2

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Lake Shore Drive		**Site ID: LSD**
Watercourse: Marsh @ Lakeshore Dr.		**Location:** Kingswood Subdivision
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0442583E, 4950431N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	Bugs
Site Accessibility: Yes, Accessible	Via Lakeshore Drive in Kingswood Subdivision
Site Access Detail:	Take Kingswood Drive off Hammonds Plains Road. Travel down to Diana Drive on left go to end and take a left on Lakeshore drive. Travel approximately 1.0 km. There will be a clearing on left down to power lines. Drive truck (4X4) down until larger clearing is reached and park. Continue (walk) down hill to ATV pathway on left. Follow pathway for approximately 250m. Sample location is on right (river with a lot of vegetation throughout)

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	12:25 pm
Sample Depth (m):	0.15
pH:	6.25
Dissolved Oxygen (mg/L):	8.67
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	9.4
Conductivity (µs/cm):	162.2

Additional Comments / Notes

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FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 9
Client:	Halifax Regional Municipality	
Site: Larry Uteck Blvd.		**Site ID: LU**
Watercourse: Pond		**Location:** Larry Uteck off-ramp
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0444954E, 4949891N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	7˚
Cloud Cover:	30%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	From Larry Uteck Blvd.
Site Access Detail:	Take Larry Uteck off ramp and continue down Larry Uteck Blvd. for approximately 320m. Park truck safely on grassy clearing on left. Sample location is at shore line of lake across road. Take walking pathway to wooded area and travel approximately 80m to lake shore. Avoid walking through the bog area on right.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	11:45 am
Sample Depth (m):	0.15
pH:	6.23
Dissolved Oxygen (mg/L):	9.68
Secchi Depth (m):	**N/A**
Water Temperature (degrees Celsius):	11.6
Conductivity (µs/cm):	483.4

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Paper Mill Lake		**Site ID: PML1**
Watercourse: Paper Mill Lake		**Location:** Moirs Mill Subdivision
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0445129E, 4951154N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	5˚
Cloud Cover:	40%
Wildlife Sightings:	No
Site Accessibility: Yes, Accessible	Travel down Ahmadi Cr. approximately 340m (around second bend in road). Park truck in front of Halifax Water station and carefully walk down rock wall on left. At the bottom locate the small stream and continue along the left and side facing lake. Sample location is a small clearing to the left at the mouth of the river.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	9:15 am
Sample Depth (m):	0.15
pH:	4.63
Dissolved Oxygen (mg/L):	12.96
Secchi Depth (m):	3.79 meters (26/10/2016)
Water Temperature (degrees Celsius):	12.1
Conductivity (µs/cm):	234.3

Additional Comments / Notes

FIELD REPORT – OCTOBER 2016

Project:	Water Quality Monitoring - Bedford West	**Sub-Area(s):** 2, 3, 4, 5
Client:	Halifax Regional Municipality	
Site: Paper Mill Lake		**Site ID: PML2**
Watercourse: Paper Mill Lake		**Location:** Moirs Mill Subdivision
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
GPS Coordinates:	20T 0445363E, 4951740N (UTM, NAD83)	
SNC Field Personnel:	Alex Hayes	

Site Conditions

Weather:	Clear
Air Temperature:	5˚
Cloud Cover:	40%
Wildlife Sightings:	Bugs
Site Accessibility: Yes, Accessible	Via Lake Dr., off Hammonds Plains Rd.
Site Access Detail:	Follow pathway along lake bank to small clearing, use GPS to find exact sample location. Travel over small ridge to reach lake and sample at edge.

Field Parameter Data

	Remarks
Date (d.m.y):	25/10/2016
Time (hh:mm):	9:50 am
Sample Depth (m):	0.15
pH:	5.37
Dissolved Oxygen (mg/L):	10.31
Secchi Depth (m):	2.55 meters (26/10/2016)
Water Temperature (degrees Celsius):	11.8
Conductivity (µs/cm):	230.3

Additional Comments / Notes

Secchi depth was depth to bottom.

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Appendix C

Site Photographs - Fall 2016

Photo 1: KL1 Kearney Lake Sample Location

Photo 2: KL2 Kearney Lake Sample Location.

Photo 3: KL3 Kearney Lake Sample Location

Photo 4: KL4 Kearney Lake Sample Location

Photo 5: KL5 Kearney Lake Sample Location

Photo 6: HWY 102-1 Sample Location

Photo 7: HWY102-2 Sample Location

Photo 8: LSD Lake Shore Drive Sample Location

Photo 9: LU Larry Uteck Sample Location

Photo 10: PML-1 Paper Mill Lake Sample Location

Photo 11: PML-2 Paper Mill Lake Sample Location

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Appendix D

Laboratory Certificate of Analysis - Fall 2016

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: **SNC Lavalin Inc.**
5657 SPRING GARDEN RD, SUITE 200
HALIFAX , NS B3J3R4
(902) 492-4544

ATTENTION TO: **Maria Gutierrez**

PROJECT: **631477**

AGAT WORK ORDER: **16X152315**

WATER ANALYSIS REVIEWED BY: **Jason Coughtrey, Inorganics Supervisor**

DATE REPORTED: **Nov 03, 2016**

PAGES (INCLUDING COVER): **8**

VERSION*: **1**

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

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Dartmouth, Nova Scotia
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Certificate of Analysis

AGAT WORK ORDER: 16X152315

PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2016-10-25

DATE REPORTED: 2016-11-03

		SAMPLE DESCRIPTION:		KL-1	KL-2	KL-3	KL-4	KL-5	HWY 102-1	HWY 102-2	LSD
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25
Parameter	Unit	G / S	RDL	7953176	7953179	7953187	7953194	7953201	7953209	7953216	7953224
Alkalinity	mg/L		5	6	6	8	8	9	10	6	8
Chloride	mg/L		1	45	30	49	49	53	35	48	31
True Color	TCU		5	18	93	21	22	17	64	86	24
Nitrate + Nitrite as N	mg/L		0.05	0.13	0.19	0.10	0.10	0.15	0.53	0.11	<0.05
Nitrate as N	mg/L		0.05	0.13	0.19	0.10	0.10	0.15	0.53	0.11	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	7.3	13.2	8.0	8.1	7.0	11.5	13.4	8.9
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH				6.81	6.19	6.93	6.89	7.03	6.45	6.15	6.38
Total Calcium	mg/L		0.1	6.3	5.6	7.3	7.3	8.2	9.9	8.6	4.8
Total Magnesium	mg/L		0.1	1.2	1.5	1.3	1.3	1.3	1.7	1.7	1.3
Total Phosphorus	mg/L		0.002	0.008	0.013	0.004	0.007	0.003	0.009	0.012	0.012
Total Potassium	mg/L		0.1	0.8	1.1	1.0	1.0	1.0	1.7	1.4	1.1
Total Sodium	mg/L		0.1	31.0	17.7	32.8	31.1	33.5	24.8	26.4	19.7
Reactive Silica as SiO2	mg/L		0.5	1.6	4.5	2.5	2.4	2.3	4.6	4.5	3.5
Total Suspended Solids	mg/L		5	<5	<5	<5	10	<5	<5	<5	15
Sulphate	mg/L		2	10	7	10	10	10	18	8	7
Turbidity	NTU		0.1	2.6	1.9	1.0	1.6	1.2	1.0	1.1	7.9
Electrical Conductivity	umho/cm		1	161	125	185	185	196	167	177	133
Anion Sum	me/L			1.61	1.13	1.76	1.76	1.89	1.60	1.65	1.18
Bicarb. Alkalinity (as CaCO3)	mg/L		5	6	6	8	8	9	10	6	8
Calculated TDS	mg/L		1	99	68	107	105	113	100	99	70
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Cation sum	me/L			1.82	1.25	1.94	1.87	2.01	1.79	1.80	1.27
Hardness	mg/L			20.7	20.2	23.6	23.6	25.8	31.7	28.5	17.3
% Difference/ Ion Balance (NS)	%			6.2	5.3	4.9	3.0	3.0	5.7	4.3	3.8
Langelier Index (@20C)	NA			-3.20	-3.85	-2.89	-2.93	-2.69	-3.14	-3.72	-3.61
Langelier Index (@ 4C)	NA			-3.52	-4.17	-3.21	-3.25	-3.01	-3.46	-4.04	-3.93
Saturation pH (@ 20C)	NA			10.0	10.0	9.82	9.82	9.72	9.59	9.87	9.99

Certified By: Original Signed

AGAT Laboratories

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 16X152315

PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2016-10-25

DATE REPORTED: 2016-11-03

		SAMPLE DESCRIPTION:		KL-1	KL-2	KL-3	KL-4	KL-5	HWY 102-1	HWY 102-2	LSD
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25	2016-10-25
Parameter	Unit	G / S	RDL	7953176	7953179	7953187	7953194	7953201	7953209	7953216	7953224
Saturation pH (@ 4C)	NA			10.3	10.4	10.1	10.1	10.0	9.91	10.2	10.3
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Copper	ug/L		1	1	2	<1	<1	<1	2	2	<1
Total Iron	ug/L		50	269	290	99	114	88	228	375	303
Total Manganese	ug/L		2	45	39	20	29	17	38	71	75
Total Zinc	ug/L		5	19	8	<5	<5	<5	6	11	<5
Total Coliforms (MPN)	MPN/100 mL		1	>2420	>2420	2420	>2420	2420	2420	>2420	>2420
E. Coli (MPN)	MPN/100 mL		1	99	25	30	29	44	10	11	16
Chlorophyll A - Acidification Method	ug/L		0.05	2.08	0.32	2.29	2.18	2.32	0.33	0.43	0.38
Chlorophyll A - Welschmeyer Method	ug/L		0.05	2.19	0.36	2.37	2.15	2.34	0.43	0.56	0.48
Total Kjeldahl Nitrogen as N	mg/L		0.4	0.6	0.5	0.4	0.4	0.7	0.7	0.6	0.5

Certified By: Original Signed

AGAT Laboratories

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TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 16X152315

PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2016-10-25

DATE REPORTED: 2016-11-03

		SAMPLE DESCRIPTION:		LU	PLM-1	PLM-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2016-10-25	2016-10-25	2016-10-25
Parameter	Unit	G / S	RDL	7953233	7953242	7953249
Alkalinity	mg/L		5	14	7	8
Chloride	mg/L		1	92	50	50
True Color	TCU		5	26	20	22
Nitrate + Nitrite as N	mg/L		0.05	2.61	0.16	0.18
Nitrate as N	mg/L		0.05	2.61	0.16	0.18
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	7.6	8.7	8.3
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01
pH				6.96	6.87	6.93
Total Calcium	mg/L		0.1	17.9	7.6	7.4
Total Magnesium	mg/L		0.1	2.6	1.3	1.3
Total Phosphorus	mg/L		0.002	0.012	0.013	0.005
Total Potassium	mg/L		0.1	2.7	1.1	1.1
Total Sodium	mg/L		0.1	65.6	32.1	32.1
Reactive Silica as SiO2	mg/L		0.5	6.7	2.7	2.6
Total Suspended Solids	mg/L		5	<5	18	<5
Sulphate	mg/L		2	41	11	10
Turbidity	NTU		0.1	3.3	2.6	1.4
Electrical Conductivity	umho/cm		1	371	189	190
Anion Sum	me/L			3.91	1.79	1.79
Bicarb. Alkalinity (as CaCO3)	mg/L		5	14	7	8
Calculated TDS	mg/L		1	242	108	108
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10
Cation sum	me/L			4.06	1.93	1.92
Hardness	mg/L			55.4	24.3	23.8
% Difference/ Ion Balance (NS)	%			1.8	3.8	3.4
Langelier Index (@20C)	NA			-2.27	-2.99	-2.89
Langelier Index (@ 4C)	NA			-2.59	-3.31	-3.21
Saturation pH (@ 20C)	NA			9.23	9.86	9.82

Certified By: Original Signed

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Certificate of Analysis

AGAT WORK ORDER: 16X152315

PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2016-10-25

DATE REPORTED: 2016-11-03

		SAMPLE DESCRIPTION:		LU	PLM-1	PLM-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2016-10-25	2016-10-25	2016-10-25
Parameter	Unit	G / S	RDL	7953233	7953242	7953249
Saturation pH (@ 4C)	NA			9.55	10.2	10.1
Total Beryllium	ug/L		2	<2	<2	<2
Total Copper	ug/L		1	3	<1	1
Total Iron	ug/L		50	223	171	123
Total Manganese	ug/L		2	35	53	23
Total Zinc	ug/L		5	52	<5	<5
Total Coliforms (MPN)	MPN/100 mL		1	>2420	>2420	>2420
E. Coli (MPN)	MPN/100 mL		1	50	10	30
Chlorophyll A - Acidification Method	ug/L		0.05	1.55	1.70	2.02
Chlorophyll A - Welschmeyer Method	ug/L		0.05	1.61	1.76	2.12
Total Kjeldahl Nitrogen as N	mg/L		0.4	0.6	0.4	0.5

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

7953176-7953249 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.

Certified By: Original Signed

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Quality Assurance

CLIENT NAME: SNC Lavalin Inc.

AGAT WORK ORDER: 16X152315

PROJECT: 631477

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Nov 03, 2016			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
SNC-Lavalin Bedford West Custom Inorganics Package															
Alkalinity	7953170		101	102	1.0%	< 5	99%	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	7953176	7953176	45	47	4.3%	< 1	93%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	1	7954888	10	12	NA	< 5	95%	80%	120%		80%	120%		80%	120%
Nitrate as N	7953176	7953176	0.13	0.15	NA	< 0.05	95%	80%	120%	NA	80%	120%	96%	80%	120%
Nitrite as N	7953176	7953176	<0.05	<0.05	NA	< 0.05	100%	80%	120%	NA	80%	120%	102%	80%	120%
Ammonia as N	1	7953170	<0.03	<0.03	NA	< 0.03	101%	80%	120%		80%	120%	105%	80%	120%
Total Organic Carbon	1	7953170	1.63	1.59	NA	< 0.5	112%	80%	120%		80%	120%	95%	80%	120%
Ortho-Phosphate as P	1	7953170	0.03	0.03	NA	< 0.01	103%	80%	120%		80%	120%	106%	80%	120%
pH	7953170		7.65	7.68	0.4%	<	100%	80%	120%	NA	80%	120%	NA	80%	120%
Total Calcium	1026201		15.8	16.4	3.7%	< 0.1	109%	80%	120%	113%	80%	120%	76%	70%	130%
Total Magnesium	1026201		1.83	1.89	3.2%	< 0.1	110%	80%	120%	112%	80%	120%	92%	80%	120%
Total Phosphorus	7953176	7953176	0.008	0.008	NA	< 0.002	95%	90%	110%	104%	90%	110%	110%	80%	120%
Total Potassium	1026201		0.9	0.9	0.0%	< 0.1	106%	80%	120%	108%	80%	120%	102%	70%	130%
Total Sodium	1026201		4.5	4.6	2.2%	< 0.1	108%	80%	120%	110%	80%	120%	87%	70%	130%
Reactive Silica as SiO2	1	7953170	9.9	9.9	0.0%	< 0.5	109%	80%	120%		80%	120%	101%	80%	120%
Total Suspended Solids	1	7952879	5	< 5	NA	< 5	103%	80%	120%		120%	120%	104%	80%	120%
Sulphate	7953176	7953176	10	10	0.0%	< 2	112%	80%	120%	NA	80%	120%	91%	80%	120%
Turbidity	1	7954884	12.3	13.6	10.0%	< 0.1	101%	80%	120%		80%	120%		80%	120%
Electrical Conductivity	7953170		167	163	2.4%	< 1	96%	80%	120%	NA	80%	120%	NA	80%	120%
Bicarb. Alkalinity (as CaCO3)	7953170		101	102	1.0%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	7953170		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Total Beryllium	1026201		< 2	< 2	NA	< 2	103%	80%	120%	109%	80%	120%	102%	70%	130%
Total Copper	1026201		2	2	NA	< 1	111%	80%	120%	120%	80%	120%	107%	70%	130%
Total Iron	1026201		815	875	7.1%	< 50	112%	80%	120%	NA	80%	120%	124%	70%	130%
Total Manganese	1026201		54	58	7.1%	< 2	115%	80%	120%	120%	80%	120%	109%	70%	130%
Total Zinc	1026201		7	8	NA	< 5	114%	80%	120%	116%	80%	120%	99%	70%	130%
Total Kjeldahl Nitrogen as N	1	7952609	<0.4	<0.4	NA	< 0.4	99%	80%	120%		80%	120%	112%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By: Original Signed

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Method Summary

CLIENT NAME: SNC Lavalin Inc.

AGAT WORK ORDER: 16X152315

PROJECT: 631477

ATTENTION TO: Maria Gutierrez

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Alkalinity	INORG-121-6001	SM 2320 B	PC-TITRATE
Chloride	INORG-121-6005	SM 4110 B	IC
True Color	INORG-121-6014	EPA 110.2	NEPHELOMETER
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	IC
Nitrite as N	INORG-121-6005	SM 4110 B	IC
Ammonia as N	INORG-121-6003	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INORG-121-6005	SM 4110 B	COLORIMETER
pH	INOR-121-6001	SM 4500 H+B	PC-TITRATE
Total Calcium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Magnesium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Phosphorus	INOR-93-1022	SM 4500-P B & E	SPECTROPHOTOMETER
Total Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Sodium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Reactive Silica as SiO2	INORG-121-6028	SM 4110 B	COLORIMETER
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC
Sulphate	INORG-121-6005	SM 4110 B	IC
Turbidity	INORG-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC-TITRATE
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS		SM 1030E	CALCULATION
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC-TITRATE
Cation sum	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
% Difference/ Ion Balance (NS)	CALCULATION	SM 1030E	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Total Beryllium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Copper	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Iron	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Manganese	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Zinc	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Coliforms (MPN)	MIC-121-7000	Based on SM 9223B	INCUBATOR
E. Coli (MPN)	MIC-121-7000	Based on SM 9223B	INCUBATOR
Chlorophyll A - Acidification Method	Subcontracted	Subcontracted	
Chlorophyll A - Welschmeyer Method	Subcontracted	Subcontracted	ICP-MS
Total Kjeldahl Nitrogen as N	INOR-121-6020	SM 4500 NORG D	COLORIMETER

Dalhousie University
Department of Oceanography
Halifax, N.S.
B3H 4R2

28-Oct-16 AGAT Laboratories, 11 Morris Dr. Unit 122, Dartmouth, NS, B3B 1M2

Attention: Janetta Fraser
Re: Determination of chlorophyll a in algae by fluorescence

AGAT Job#: 16X152315
PO#: 103532

Acidification Technique:

Sample ID	Chl a (µg/L)
KL-1	2.08
KL-2	0.32
KL-3	2.29
KL-4	2.18
KL-5	2.32
HWY 102-1	0.33
HWY 102-2	0.43
LDS	0.38
LU	1.55
PML-1	1.70
PML-2	2.02

Welschmeyer Technique:

Sample ID	Chl a (µg/L)
KL-1	2.19
KL-2	0.36
KL-3	2.37
KL-4	2.15
KL-5	2.34
HWY 102-1	0.43
HWY 102-2	0.56

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LDS	0.48
LU	1.61
PML-1	1.76
PML-2	2.12

- **CHl a = chlorophyll a**
- **An underestimation of chl a occurs by the fluorescence acidification technique in the presence of Chl b. Since chl b containing chlorophytes are often present in freshwater ecosystems another technique (welschmeyer) was also employed.**
- **Reference for Welschmeyer technique Limnol. Oceanogr., 39(8) 1994, 1985-1992**

Received: 26-Oct-16
Completed: 27-Oct-16

Original Signed

Shannah Rastin

phone: (902)494-6663 **fax: (902)494-2039**

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Appendix E

Graphs Fall 2016

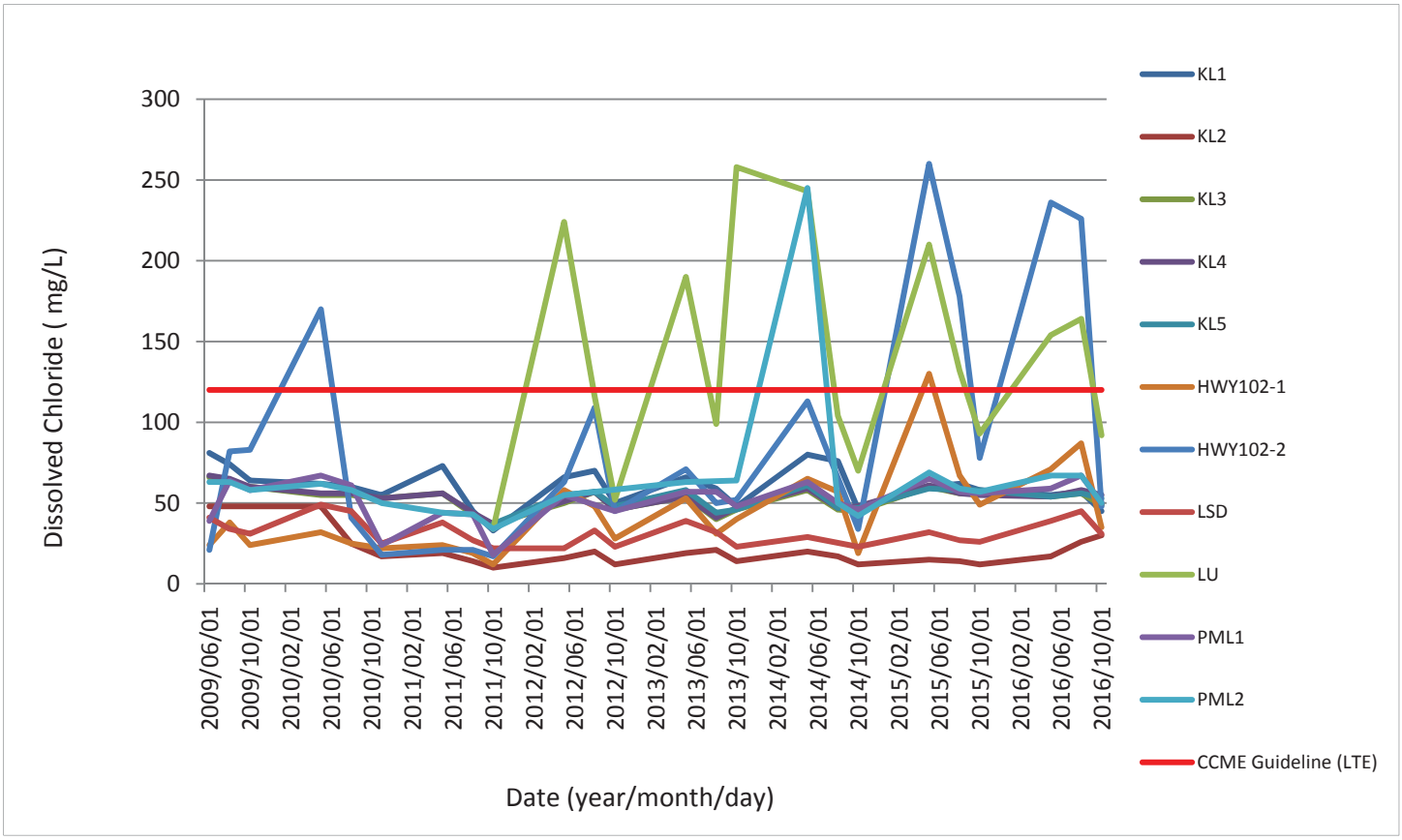


Figure 1 - Dissolved chloride concentrations

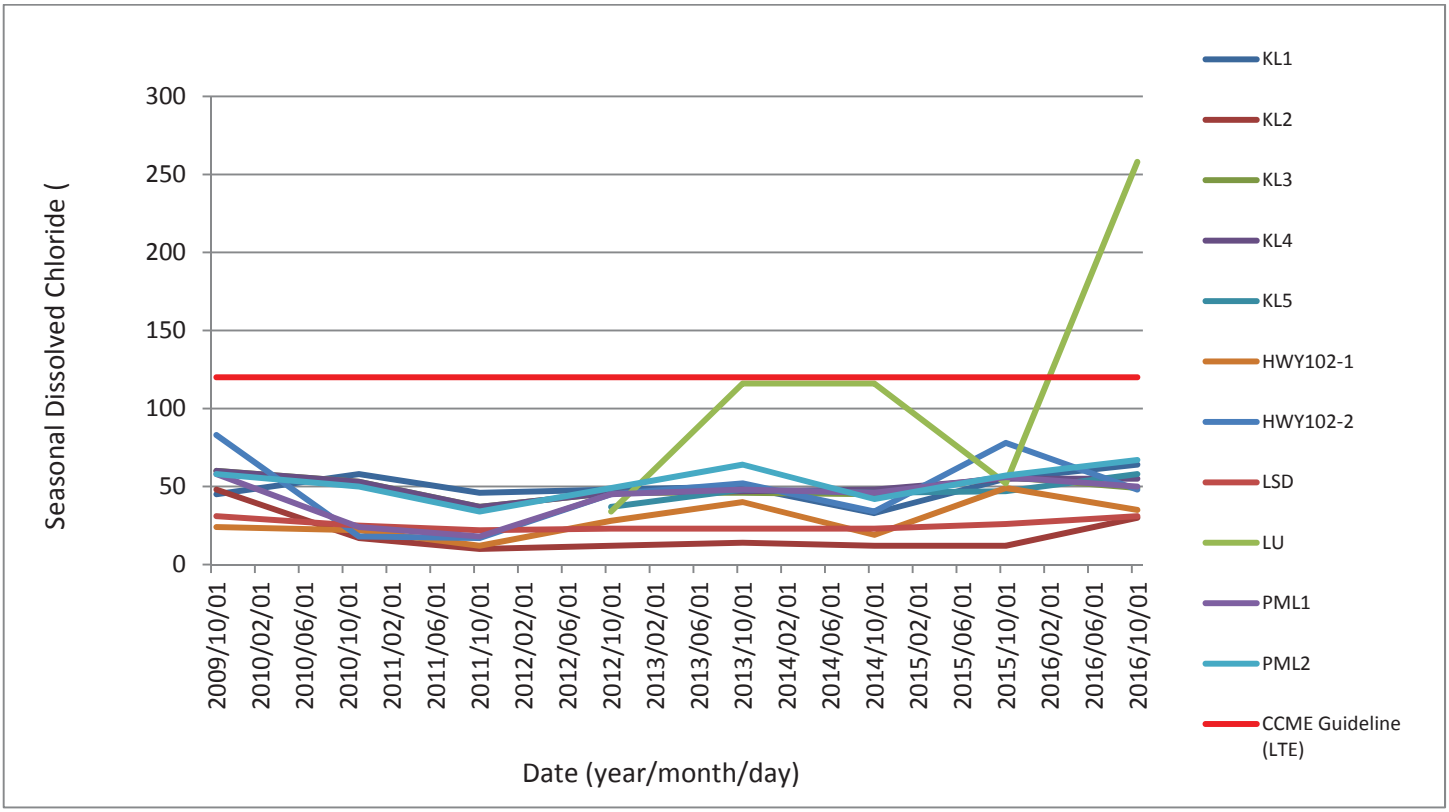


Figure 2 – Seasonal dissolved chloride concentrations

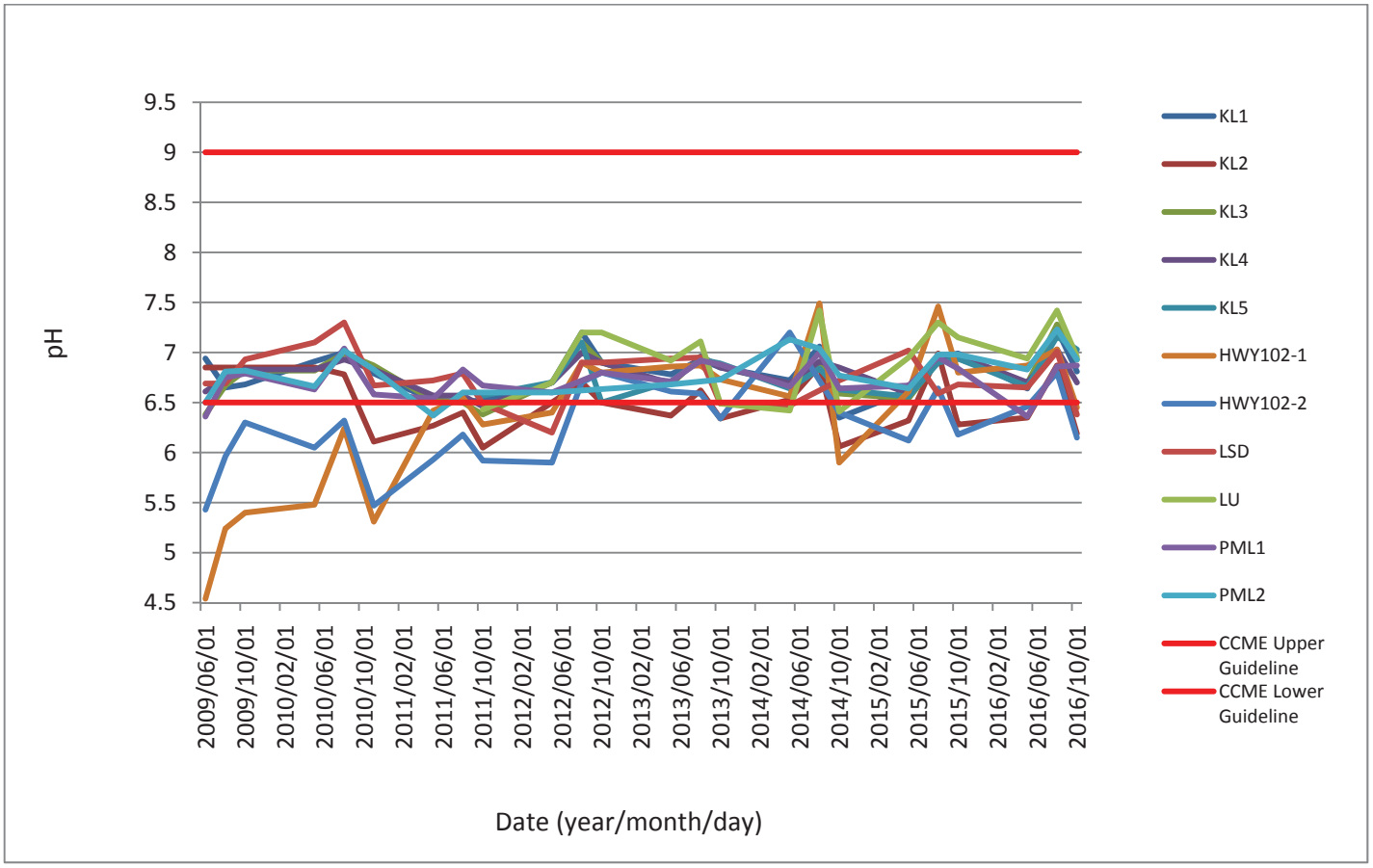


Figure 3 – pH

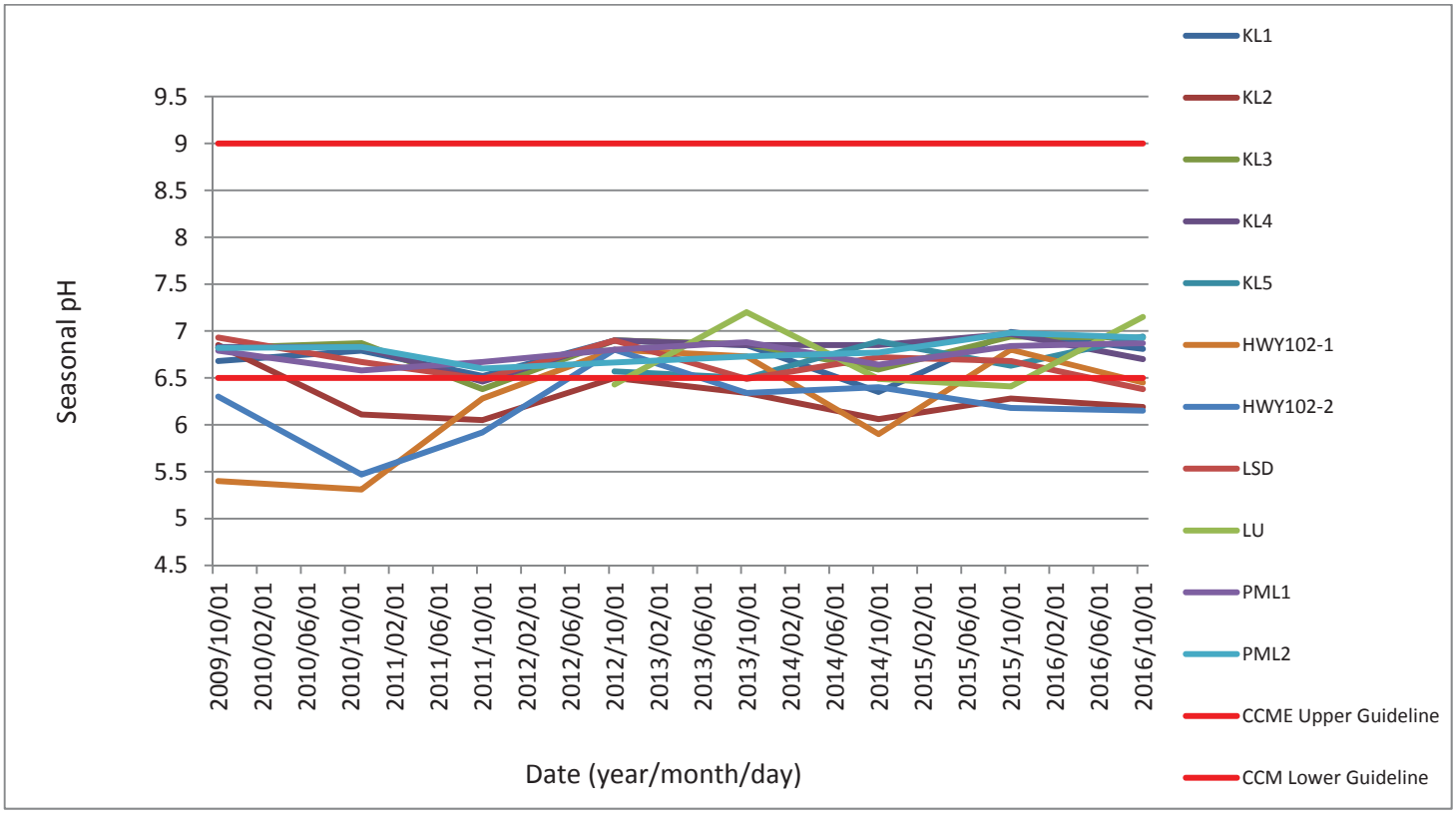


Figure 4 – Seasonal pH

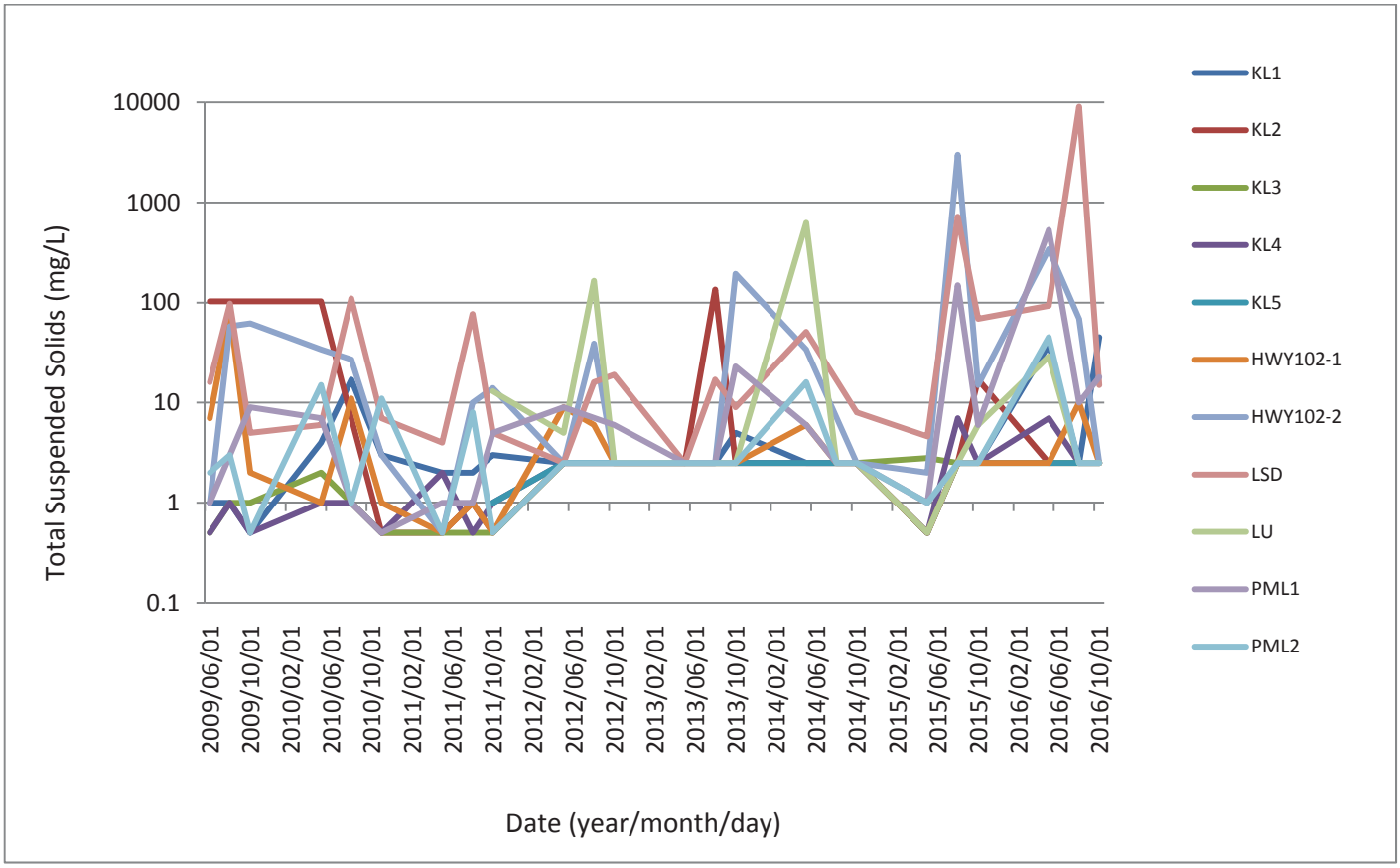


Figure 5 – Total suspended solids concentrations

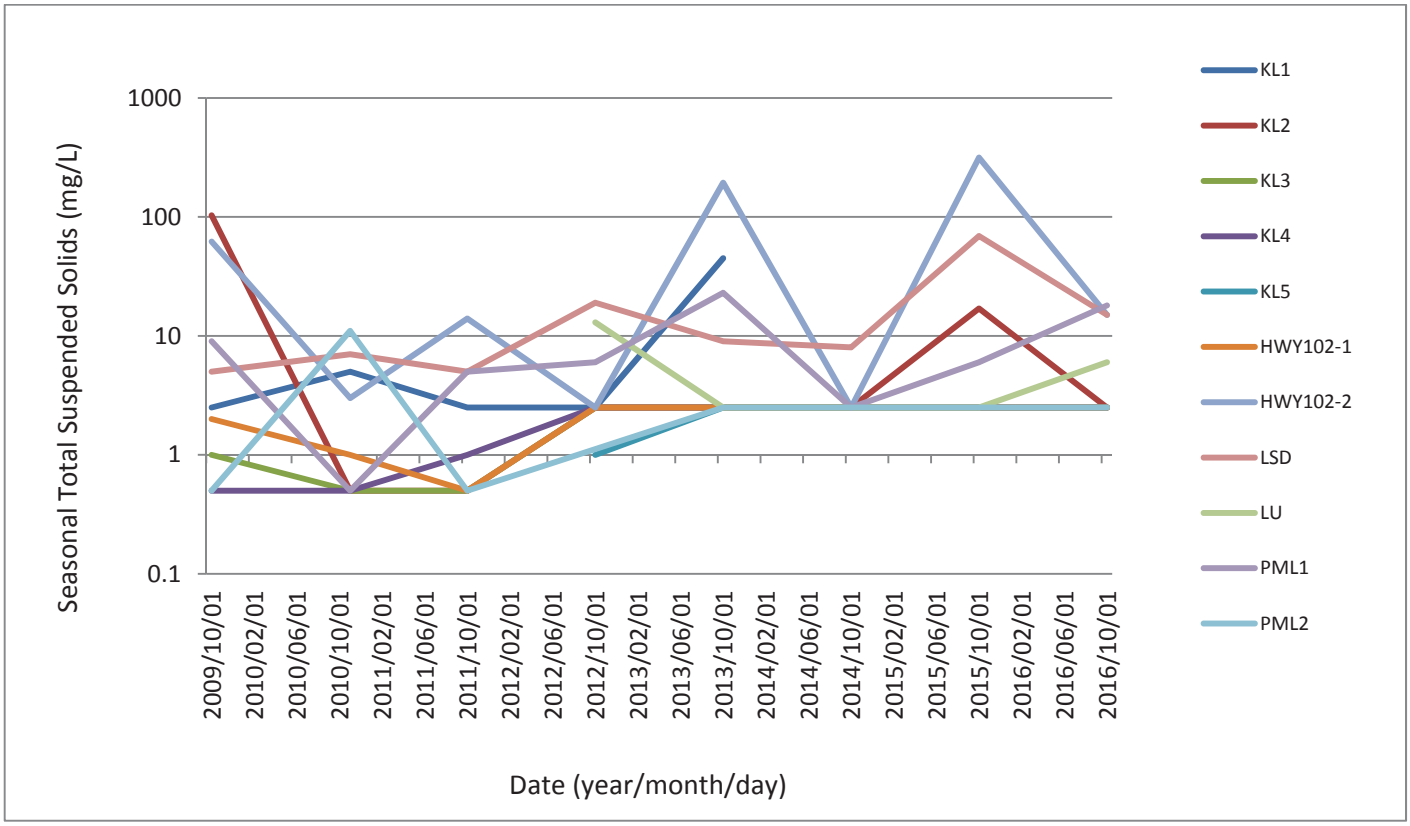


Figure 6 – Seasonal total suspended solids concentrations

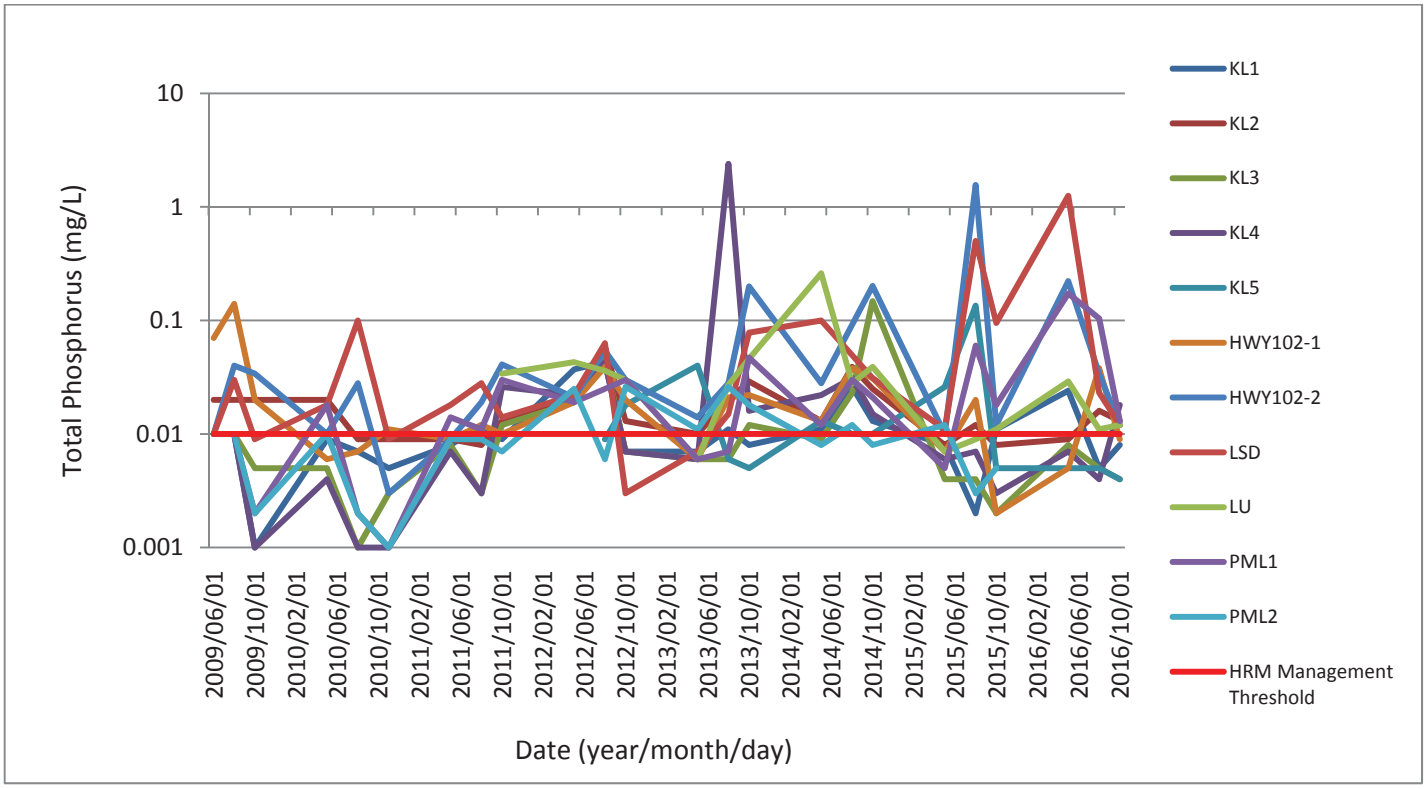


Figure 7 – Total phosphorus concentrations

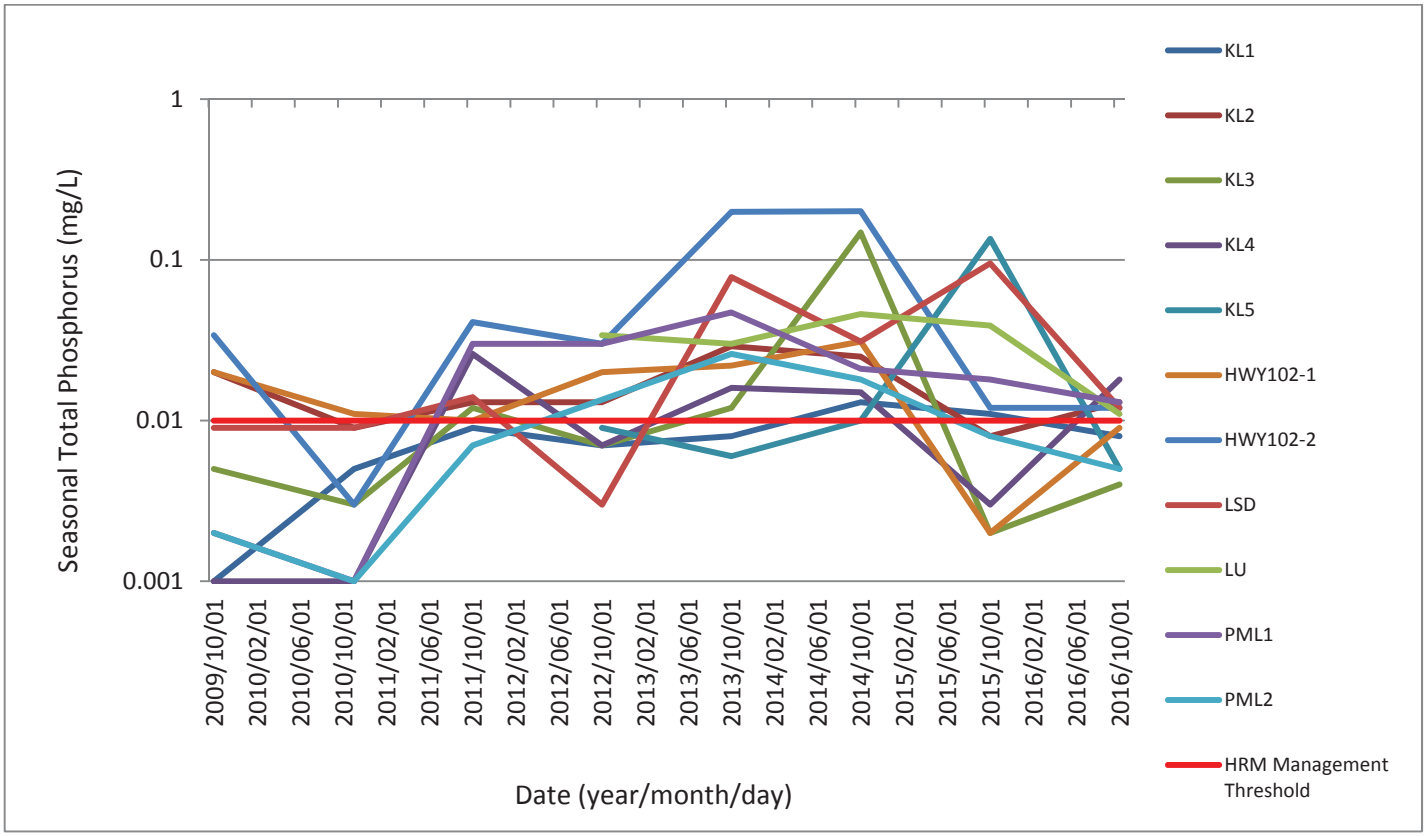


Figure 8 – Seasonal total phosphorus concentrations

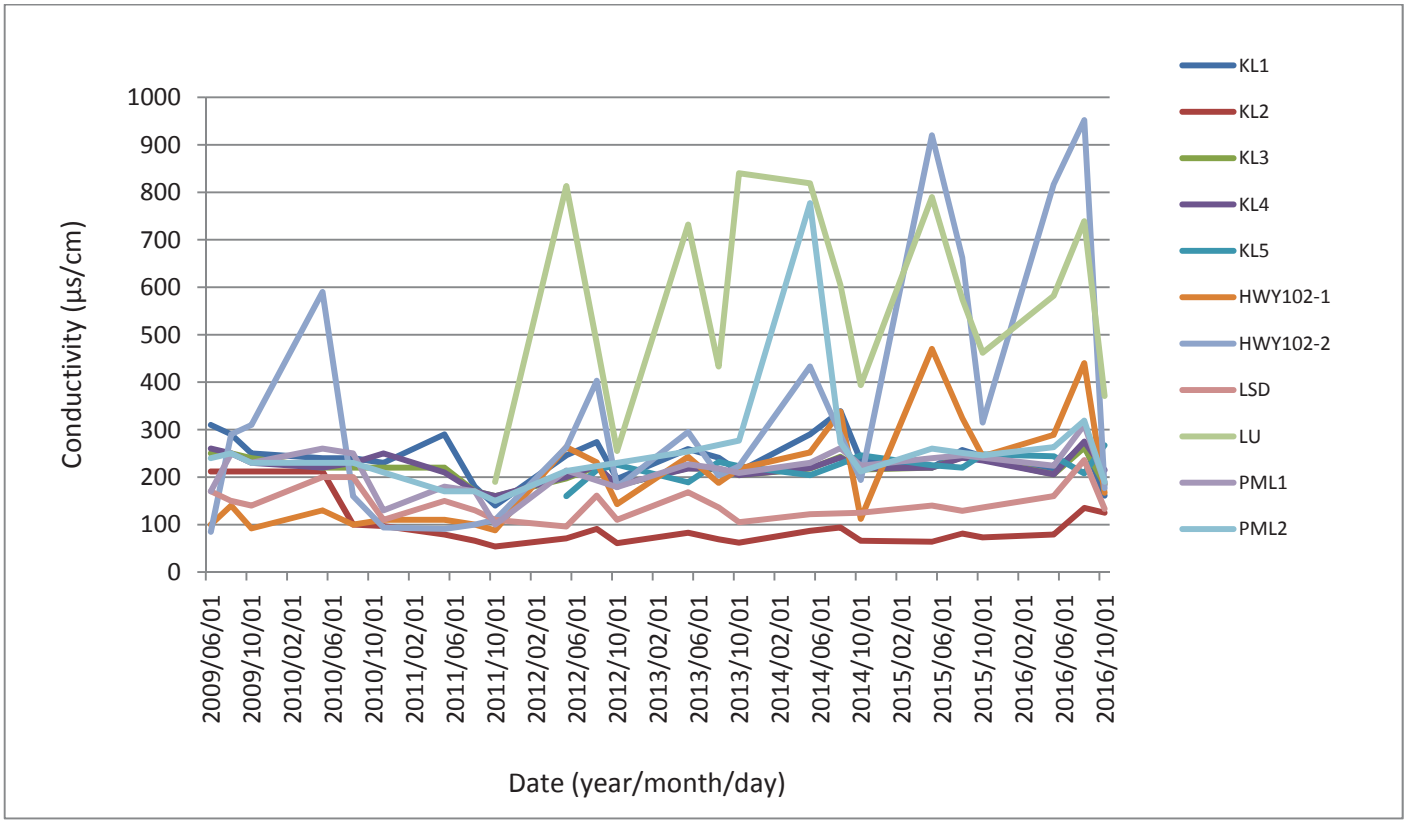


Figure 9 – Conductivity

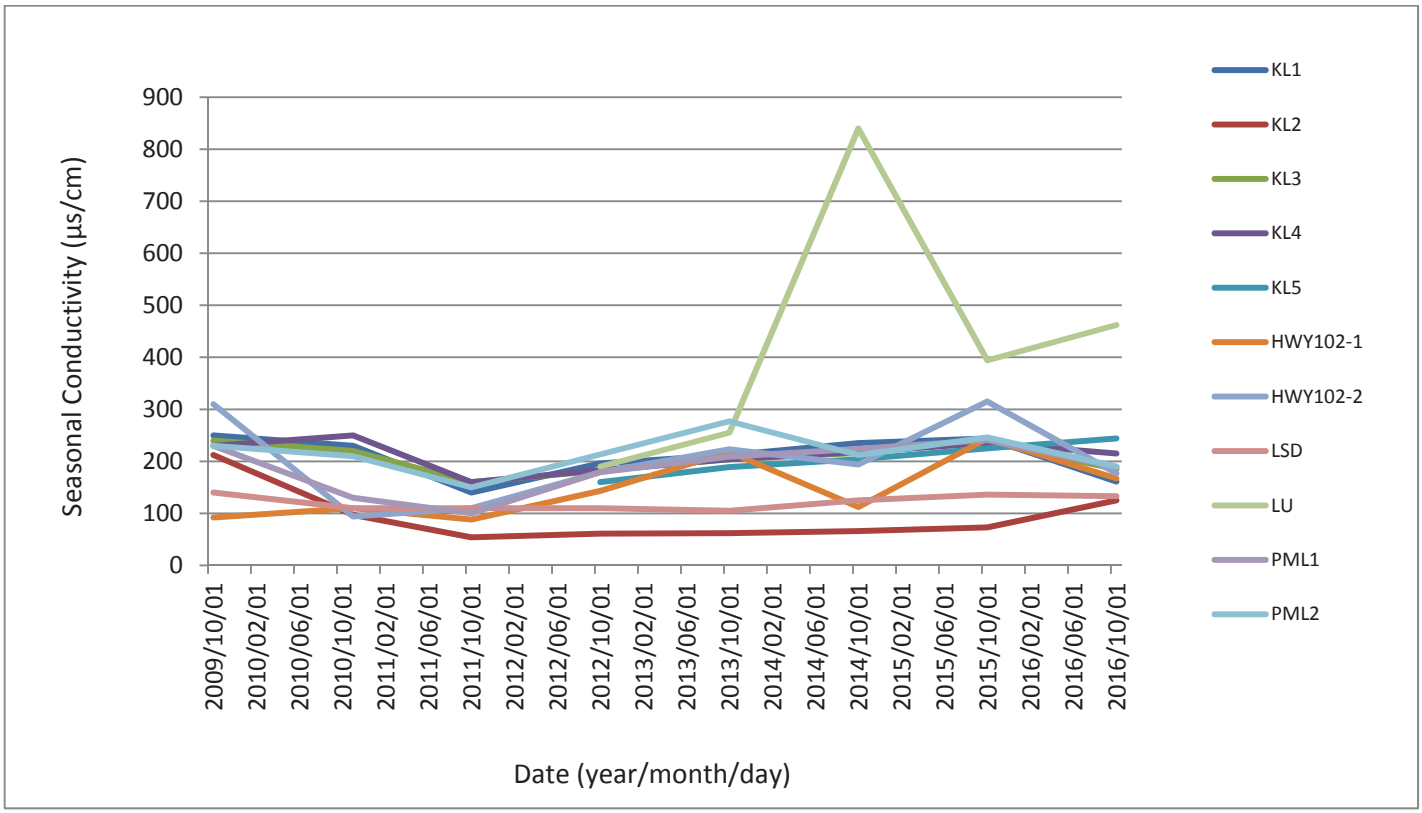


Figure 10 – Seasonal conductivity

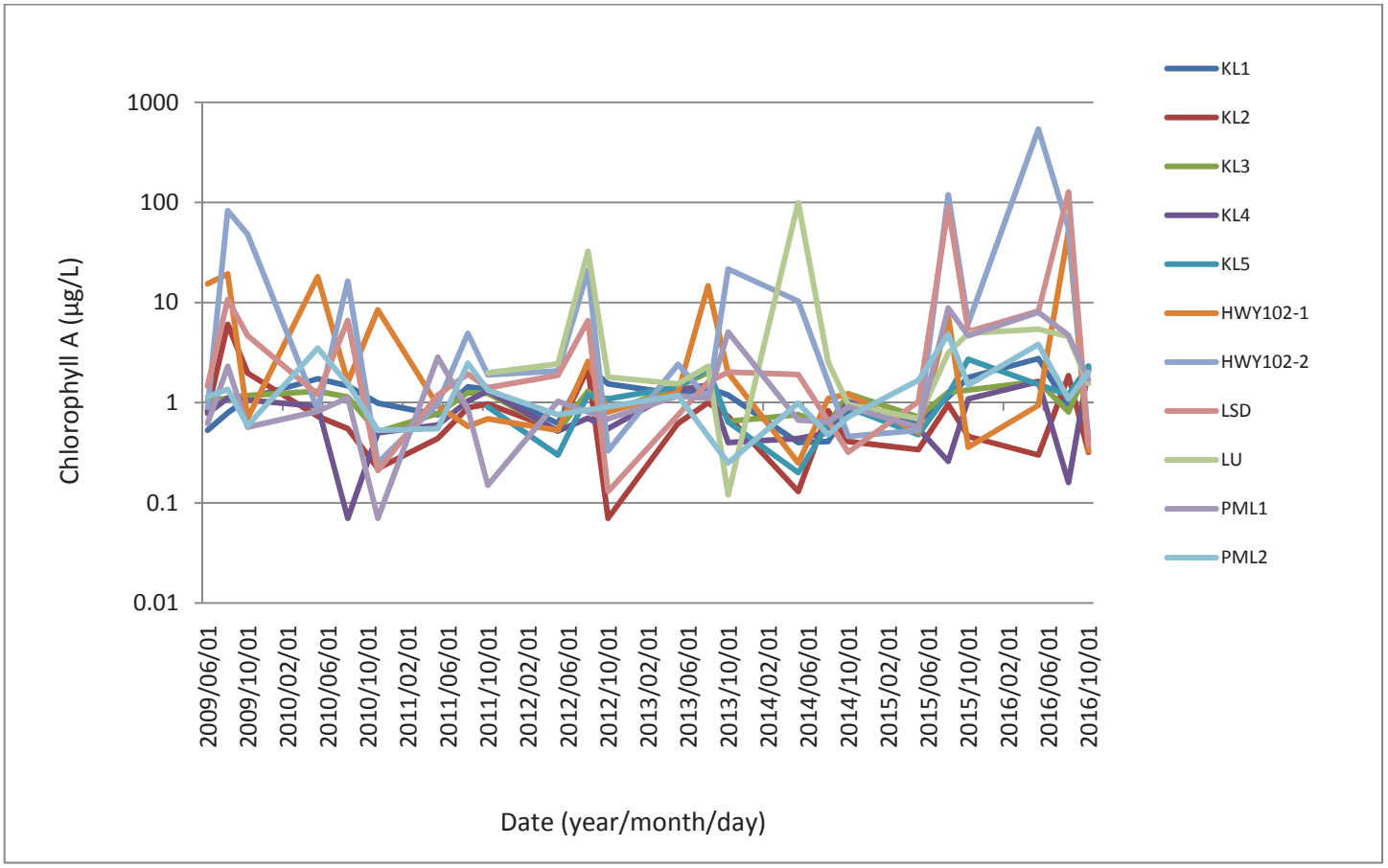


Figure 11 – Chlorophyll A concentrations

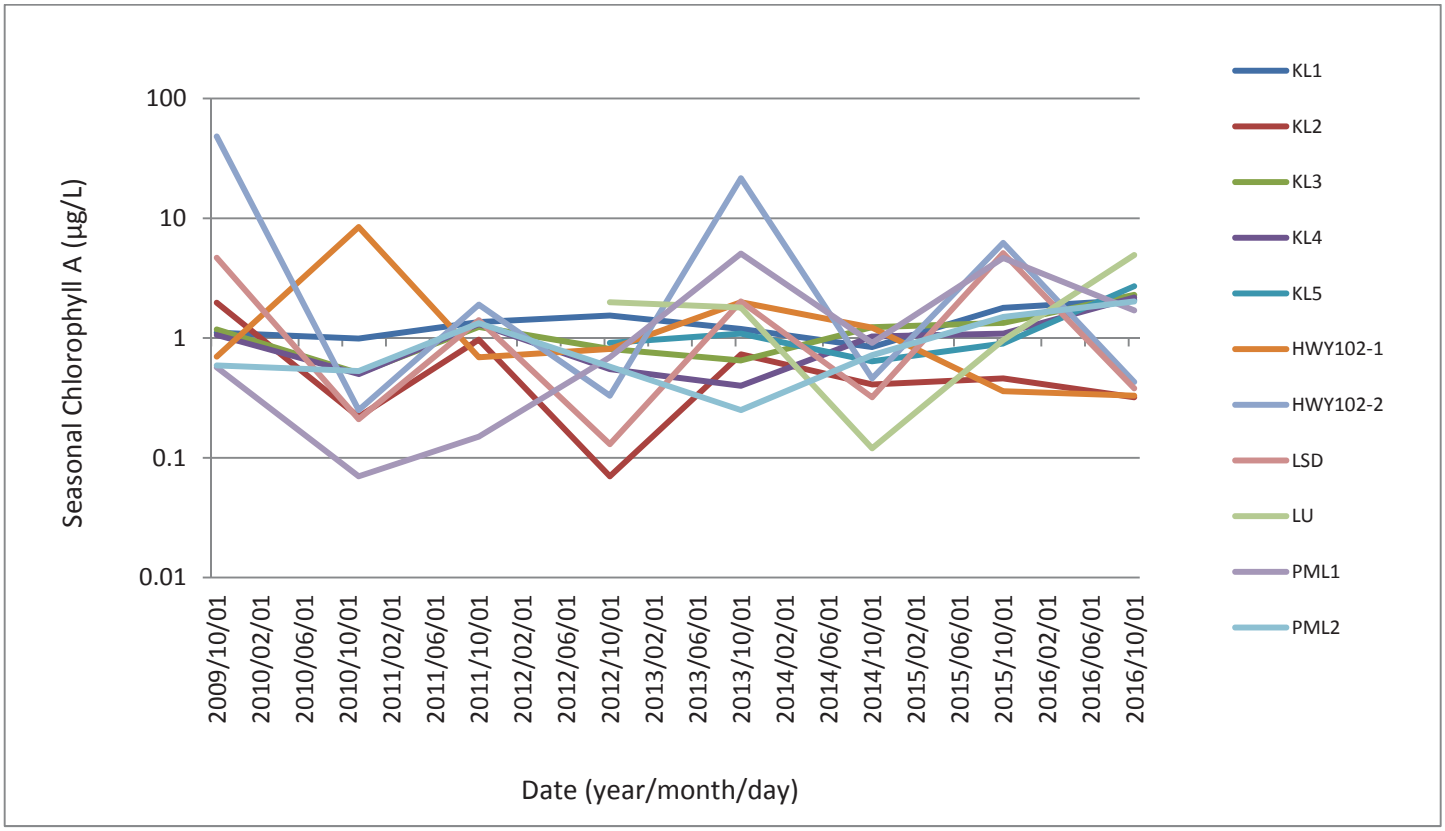
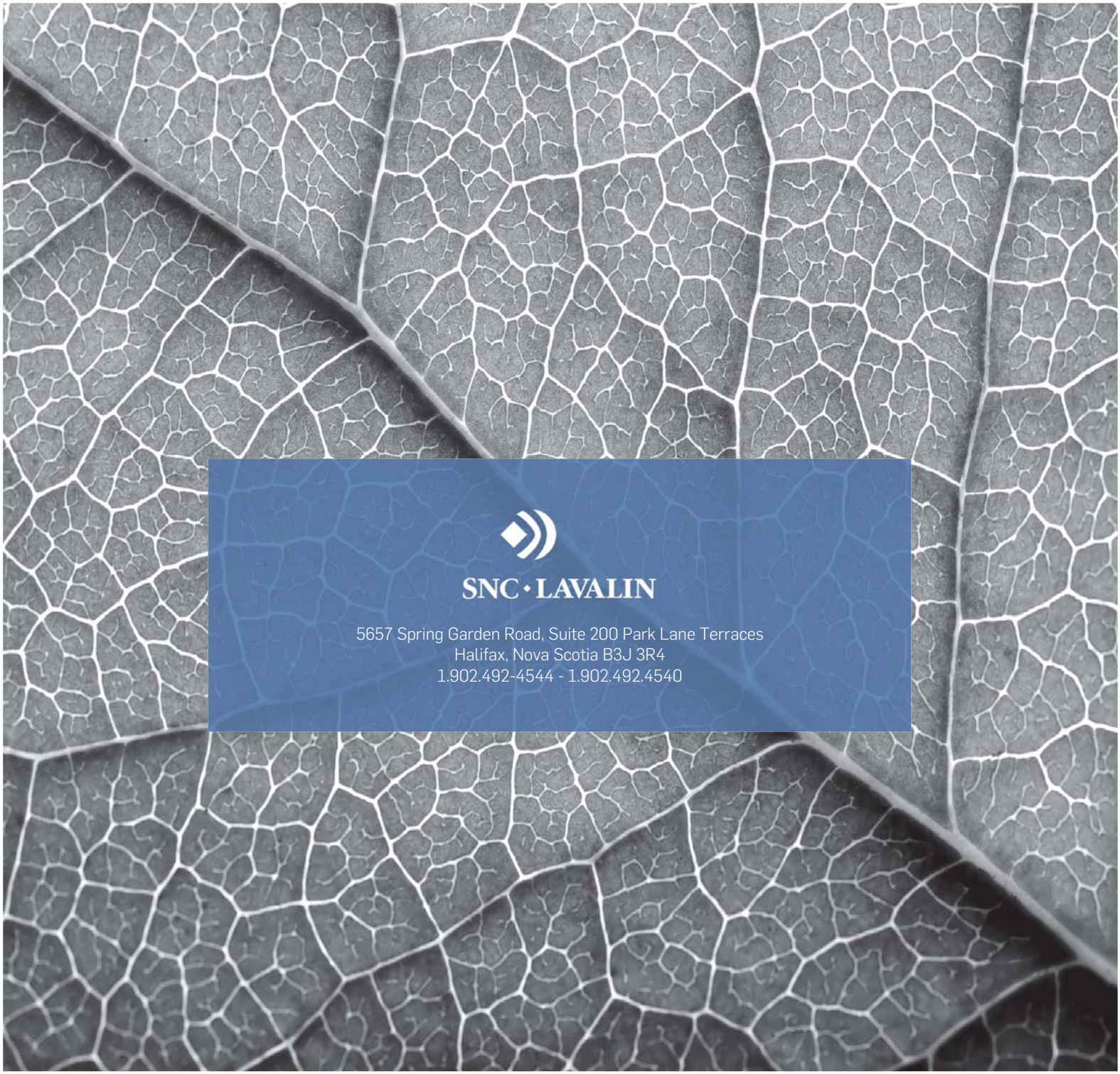


Figure 12 – Seasonal chlorophyll A concentrations



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