P.O. Box 1749
Halifax, Nova Scotia
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Item No. 12.1.1
North West Community Council
March 11, 2019
April 8, 2019

TO: Chair and Members of North West Community Council

SUBMITTED BY: Original Signed

Kelly Denty, Planning & Development

Original Signed

Jacques Dubé, Chief Administrative Officer

DATE: January 7, 2019

SUBJECT: **Bedford West Water Quality Status Update – Fall 2018**

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. The eutrophication 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 water quality monitoring 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.

The terms of the monitoring program are specified within Development Agreements that have been negotiated in consultation with the Bedford Watershed Advisory Board. The Bedford Watershed Advisory Board was dissolved in 2013 and all development agreements for the Bedford West subdivision negotiated since 2013 have been negotiated instead with the Regional Watersheds Advisory Board (RWAB).

All such development agreements have identified the value of 10 micrograms per litre (µg/L) of total phosphorus (TP) 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 (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. Environment Canada (2004).

In accordance with the terms of the Bedford West development agreements, the Municipality is required to submit test results to the Developer, the Community Council, and RWAB within three months of being received from the consultant, or immediately, if total phosphorus ("TP") or bacterial results exceed management thresholds identified therein.

DISCUSSION

The purpose of this report is to share the results of the October 2018 monitoring event. TP concentrations exceeded the trigger value of 10 µg/L at five stations in October. The final report for the fall 2018 monitoring event was received on November 29, 2018.

As noted in the Background section of the report, the Bedford West Development agreement stipulates that results be reported within three months. This provision is based on the assumption that development activity bears some relation to the test results. Consultant research has since pointed out that changes in water quality cannot be attributed to a single source, and further has recommended that individual developments should not be regulated based on trophic state indicators in a lake.[1] The study recommendations will be taken into consideration when a review of the municipal-wide Water Quality and Watershed Assessment Program is carried out.

[1] Presentation by Rob Jamieson, Ph.D., P.Eng. entitled "Phosphorus Loading and Trophic State Assessment in the Paper Mill Lake Watershed", North West Community Council, November 15, 2016.

A summary of TP results observed at all stations during these events is presented below in Table 2. It is important to note that these results only represent water quality at the time that the samples were collected.

Sample Station	October 2018 Concentration (µg/L)	Exceedance
KL1	8	No
KL2	4	No
KL3	6	No
KL4	4	No
KL5	5	No
HWY 102-1	10	No
HWY 102-2	14	Yes
LSD	18	Yes
LU	21	Yes
PML1	12	Yes
PML2	12	Yes

Table 2. Summary of TP results and exceedances October 2018.

The first annual monitoring event for 2019 will be conducted in May, and the results from that event will be reported to the North West Community Council in September 2019

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 Fall 2018.

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Cameron Deacoff, Water Resources Specialist, 902.490.1926

Report Approved by: Original Signed

Shannon Miedema, Energy & Environment Program Manager, 902.490.3665

SNC·LAVALIN

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November 28, 2018

SENT VIA EMAIL: deacofc@halifax.ca

Halifax Regional Municipality
Halifax, Nova Scotia

Attention: **Mr. Cameron Deacoff, MMM, PMP, CLP**
Environmental Performance Officer
Planning and Development

Dear Mr. Deacoff:

RE: **Final Report: Surface Water Quality Monitoring Program, 2018 Autumn 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 2018 autumn surface water quality sampling event for the Bedford West Water Quality Monitoring Program in Bedford, Nova Scotia.

If you have any questions, please contact the undersigned or in his absence, please contact Maria Gutierrez, BSc, MEM, at 902.492.4544 Ext 308.

Yours truly,

SNC♦LAVALIN INC.

Original signed

Michael Smith, *AScT, B.Tech, EP*
Area Lead, Environmental Engineering
Infrastructure Engineering – Eastern Canada
(709) 368-0118 Ext. 54957

631477-0001-T-4E-REP-000-0013-C01

Surface Water Quality Monitoring Program, Bedford West
Bedford West, Nova Scotia, Canada

2018 Autumn Final Report

2018/11/28

Prepared for:

Halifax Regional Municipality

Attention: Cameron Deacoff, MMM, PMP, CLP

Environmental Performance Officer

Halifax, NS

PH: (902) 490-1926

Prepared by:

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EXECUTIVE SUMMARY

On October 17, 2018 SNC-Lavalin Inc. (SNCL) completed the Bedford West water quality monitoring program (2018 autumn event) on behalf of Halifax Regional Municipality (HRM). The sampling program consisted of collecting surface water samples from eleven (11) water quality stations. Field parameters were recorded and surface water samples were collected for laboratory analyses. The laboratory analysis included the following analysis: inorganics, calculated parameters, standard elements and microbiological.

The applicable water quality assessment standards 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 autumn monitoring event, five (5) monitoring stations reported concentrations that exceeded the Total Phosphorous (TP) management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L) listed in the HRM RFP14-338. Based on the laboratory results reported in milligrams per litre (mg/L), the TP exceedances were as follows:

- HWY102-2: 0.014 mg/L (equivalent to 14 µg/L)
- LSD: 0.018 mg/L (equivalent to 18 µg/L)
- LU: 0.021 mg/L (equivalent to 21 µg/L)
- PML1: 0.012 mg/L (equivalent to 12 µg/L)
- PML2: 0.012 mg/L (equivalent to 12 µg/L)

In-Situ readings of parameters such as pH, dissolved oxygen, water temperature and conductivity were recorded at all eleven (11) stations:

- All eleven (11) stations, recorded In-Situ pH values well within the Health Canada Guideline for Recreational Water Quality range of 5.0 - 9.0 pH. However, pH values as stations KL2 (5.84 pH) and LSD (5.90 pH) were recorded outside CCME-PAL-F recommended range of 6.5 - 9.0.
- In-Situ dissolved oxygen concentrations were well within the CCME PAL-F recommended range of 5.5 - 9.5 mg/L for all stations, with the exception of LU: 9.79 mg/L

- In-Situ water temperature was recorded between 9.3°C and 13.1°C.
- In-Situ water conductivity was recorded between 67.2 µs/cm to 384.4 µs/cm.

Secchi depth readings were collected at six (6) stations. Recorded values meet the Health Canada reference guideline of minimum of 1.2 meters (m): KL1 (2.1 m); KL2 (1.4 m); KL5 (3.01 m); PML-1 (2.4); and PML-2 (3.0 m).

The following parameters reported concentrations above the recommended Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (CCME-PAL-F, edition 2015) and/or the Nova Scotia Environment (NSE) Environmental Quality Standards (EQS) for Surface Water, EQS for Contaminated Sites (NSE 2014) and/or the Health Canada guidelines for Recreational Water Quality:

- Laboratory pH was reported at all eleven (11) stations well within Health Canada range of 5.0-9.0 for Recreational Water Quality. However, station KL2 (6.3 pH) was outside the CCME-PAL-F recommended range of 6.5-9.0 pH.
- Copper concentrations exceeded the NSE EQS and CCME-PAL-F limit of 2 µg/L at stations HWY-102-1 (3 µg/L) and LU (5.0 µg/L).
- Iron concentrations exceeded the NSE EQS and CCME-PAL-F limit of 300 µg/L at stations KL2 (336 µg/L) and HWY102-1 (403 µg/L)
- Zinc concentrations exceeded the NSE EQS and CCME-PAL-F limit of 30 µg/L at stations HWY102-2 (69 µg/L) and LU (38 µg/L)

In terms of microbiological analyses, E. Coli was not found in exceedance of the Health Canada Guideline of 400 CFU/100 mL, at any of the eleven (11) sampling locations.

There are no applicable Health Canada guidelines for Total Coliforms (TC) in recreational water; however, reported concentrations were above the laboratory RDL of 1 CFU/100mL at all eleven (11) stations. Reported TC concentrations ranged from 81 CFU/100ml to 8,000 CFU/100ml.

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1. INTRODUCTION

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 autumn since 2015. The results of the 2018 autumn 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 Bedford West development in order to detect any impacts on and/or changes to water quality.

The 2018 autumn sampling stations are summarized in Table 1 and shown in Drawing 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

N

HWY102-2

PML2

HWY102-1

PAPER MILL LAKE

PML1

KL4

LSD

KL3

KL2

LU

KEARNEY LAKE

KL5

KL1

Legend

- Water Quality Monitoring Test Locations/Sample Identification

0 200 400 800 1,200 1,600

Meters

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HALIFAX REGIONAL MUNICIPALITY

PROJECT:	WATER QUALITY MONITORING WITHIN BEDFORD WEST
TITLE:	WATER QUALITY MONITORING TEST LOCATIONS
DESIGNED:	CH
DRAWN:	CH
CHECKED:	DH
SCALE:	AS SHOWN
DATE:	21-09-2015
PROJECT #:	631477-0001
DRAWING #:	1

2. METHODOLOGY

The 2018 autumn 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)	Inorganics (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, associated field parameters and secchi depth measurements were collected on October 17, 2018.

Field measurements of pH, dissolved oxygen, specific conductivity and water temperature were taken at

each station using an YSI Professional Plus multi meter probe (serial number 18G102273). The instrument was calibrated on October 14, 2018. The calibration certificate issued by the equipment provider is enclosed in Appendix A.

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 (See Appendix B, Field Reports). Each sample station was photographed during the sample event (See Appendix C, Site Photographs).

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. Water samples and field parameter readings were collected within a depth of ≤1.0 m below surface (if possible). It should be noted that samples were collected from the shore at nine (9) stations (KL1, KL2, KL3, KL4, KL5, HWY-102-1, HWY-102-2, LSD and LU) and from a boat at two (2) stations (PML-1 and PML-2) which require secchi depth readings.

Surface water samples were collected and placed in clean laboratory-supplied bottles and stored in a chilled container together with a chain of custody record for transport to the laboratory. Laboratory analysis was completed by AGAT Laboratories located in Dartmouth, Nova Scotia. AGAT is an accredited laboratory by the Standard Council of Canada (SCC), Canadian Association for Laboratory Accreditation (CALA), and ISO 9001:2015.

3. APPLICABLE GUIDELINES

For this water quality monitoring program, the Federal and Provincial water quality guidelines being used for the assessment of surface water quality results are as follows, the Canadian Council of Ministers of the Environment (CCME) Guidelines for the Protection of Aquatic Life – Freshwater (PAL-F) (Version 2015), the Health Canada (HC) guidelines for Canadian Recreational Water Quality (2012, Third Edition), and 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. These guidelines were used to determine whether a tested parameter was in exceedance. Exceedances may be an indication of water quality impairment or conditions that will eventually lead to impairment. A detail description of the guidelines is presented below:

CCME Guidelines

- The CCME PAL-F guidelines were used for parameters such as dissolved oxygen, pH (In-Situ and analytical), Chloride, Nitrate, Nitrite, Nitrogen, as well as for total metals such as Aluminum, Arsenic, Boron, Cadmium, Cooper, Iron, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Uranium, and Zinc.
- There is no a CCME recommend value for Total Suspended Solids (TSS), however the following CCME narrative for TSS at high flow was applied "maximum increase of 25 mg/L from

background levels at any time when background levels are between 25 and 250 mg/L should not increase more than 10% of background levels when background is ≥ 250 mg/L".

- According to CCME, 10 µg/L of total phosphorous is the threshold between oligotrophic and mesotrophic classifications. In the Canadian framework, 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 may trigger the need for further investigation. HRM defined a Total Phosphorous management threshold value of 10 µg/L or 0.01 mg/L for this monitoring program.

HC Guidelines

- The HC guidelines for Canadian Recreational Water Quality was used for parameters such as secchi depth (i.e. visibility at a minimum depth of 1.2 metres), pH guideline of 5.0-9, turbidity (limit of 50 Nephelometric Turbidity Units), and E. coli (i.e. ≤400 E.Coli/100mL).

NSE Guidelines

- The NSE EQS were used for assessment of total metals such as 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 2018 autumn 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 parameters such as In-Situ pH, dissolved oxygen, water temperature, conductivity and secchi depth (where applicable) were recorded on field data sheets. Collected data is enclosed in Appendix B.

Field measurements are also tabulated in Appendix D: Table D1 - Autumn Results and Table D2 – historical Results.

In-Situ pH

All eleven (11) stations were within the 5.0 - 9.0 pH Health Canada range for Recreational Water Quality. However, pH values outside of the CCME-PAL-F recommended range of 6.5 - 9.0, were found at the following two (2) stations:

- KL2: pH 5.8
- LSD: pH 5.9

Dissolved Oxygen

Dissolved oxygen concentrations were outside of the CCME PAL-F recommended range of 5.5-9.5 mg/L at one (1) station:

- LU: 9.8 mg/L

Water Temperature

There are no applicable Health Canada or NSE guidelines for recreation water temperature. Water temperature was recorded between 9.3°C and 13.1°C.

Conductivity

There are no applicable Health Canada or NSE guidelines for recreation water conductivity. However, specific water conductivity was recorded between 67.2 µs/cm to 384.4 µs/cm.

Secchi Disk Depth

As per scope of work secchi depths were collected at five (5) monitoring stations. Secchi depth readings met the Health Canada reference guideline of minimum of 1.2 meters (m). Recorded values were as follows:

- KL1: 2.5 m
- KL2: 1.4 m
- KL5: 3.8 m
- PML-1: 2.9 m
- PML-2: 2.2 m

6. ANALYTICAL RESULTS

Analytical results of the 2018 autumn monitoring event and applicable/reference guidelines are tabulated in Table D1 and enclosed in Appendix D. In addition, historical water quality results from 2009 - 2018 are summarized in Table D2 and enclosed in Appendix D.

Laboratory certificates of analysis for the 2018 autumn event are located in Appendix E.

6.1 Total Phosphorous

Five (5) monitoring stations reported concentrations that exceeded the Total Phosphorous (TP) management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L) listed in the HRM RFP14-338. Based

on the laboratory results reported in milligrams per litre (mg/L), the TP exceedances were as follows:

- HWY102-2: 0.014 mg/L (equivalent to 14 µg/L)
- LSD: 0.018 mg/L (equivalent to 18 µg/L)
- LU: 0.021 mg/L (equivalent to 21 µg/L)
- PML1: 0.012 mg/L (equivalent to 12 µg/L)
- PML2: 0.012 mg/L (equivalent to 12 µg/L)

6.2 General Chemistry

For all inorganic parameters tested, only pH values were reported outside the applicable CCME PAL-F guidelines. No other exceedances were reported.

Laboratory pH

All eleven (11) stations reported pH values well within Health Canada range of 5.0-9.0 for Recreational Water Quality; however station KL2 (6.3 pH) was outside the CCME-PAL-F range of 6.5-9.0

6.3 Metals

The following metals were analyzed during the autumn monitoring event: Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium and Zinc. Exceedances were reported as follows:

Copper

Two (2) stations exceeded the NSE EQS guideline and CCME-PAL-F limit of 2 µg/L (based on hardness of <82 mg/L):

- HWY-102-1: 3 µg/L
- LU: 5.0 µg/L

Iron

Two (2) stations exceeded the NSE EQS guideline and CCME-PAL-F limit of 300 µg/L:

- KL2: 336 µg/L
- HWY102-1: 403 µg/L

Zinc

Two (2) stations exceeded the NSE EQS guideline and CCME-PAL-F limit of 30 µg/L:

- HWY102-2: 69 µg/L
- LU: 38 µg/L

6.4 Microbiological

There were no exceedances of the Heath Canada (HC) E.Coli Guideline of ≤ 400 CFU/100 mL.

HC does not have a guideline for Total Coliform (TC) in regards to recreational water quality. All eleven (11) stations reported TC concentrations above the laboratory RDL of 1 CFU/100mL. Reported concentrations ranged from 81 CFU/100ml to 8,000 CFU/100ml.

7. STATISTICAL PRESENTATION

Statistics include water quality data from 2009 to October 2018 of all eleven (11) water quality monitoring stations. Table 3 provides the autumn seasonal statistics for the following six (6) key water quality parameters selected by HRM:

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

Where analytical results were found to be less than the laboratory Reportable Detection Limit (<RDL), the statistics (i.e. minimum, maximum, media and average) were calculated as half the laboratory reportable detection limit (1/2 RDL value) as a conservative approach.

It should be noted that number of decimal places presented for each listed parameter is based on the decimal places of the RDL and reported Laboratory certificate of analysis.

Table 3: Statistical Presentation of Key Water Quality Parameters for Autumn

KL-1	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.008	0.005	0.013	0.008	0.008
Chloride (mg/L)	1	55	33.0	64.0	52.5	51.4
Lab pH	N/A	7.07	6.4	7.1	6.8	6.8
Total Suspended Solids (mg/L)	5	<5	0.5	5.0	2.5	2.7
Conductivity (uS/cm)	1	215	140.0	250.0	222.5	213.2
Chlorophyll-A Acidification Method (µg/L)	0.05	1.63	0.8	2.1	1.3	1.4

KL-2	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.004	0.004	0.029	0.013	0.014
Chloride (mg/L)	1	11	10.0	48.0	13.0	18.5
Lab pH	N/A	6.27	6.1	6.9	6.3	6.3
Total Suspended Solids (mg/L)	5	<5	0.5	103.0	2.5	13.6
Conductivity (uS/cm)	1	70	54.0	212.0	71.5	91.7
Chlorophyll-A Acidification Method (µg/L)	0.05	0.75	0.1	2.0	0.4	0.6

KL-3	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.006	0.002	0.148	0.007	0.021
Chloride (mg/L)	1	46	37.0	60.0	47.5	49.7
Lab pH	N/A	7.10	6.4	7.1	6.9	6.8
Total Suspended Solids (mg/L)	5	<5	0.5	2.5	2.5	2.0
Conductivity (uS/cm)	1	232	160.0	247.0	218.0	212.4
Chlorophyll-A Acidification Method (µg/L)	0.05	1.28	0.5	2.3	1.2	1.2

KL-4	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.004	0.001	0.026	0.007	0.009
Chloride (mg/L)	1	47	37.0	60.0	48.5	50.1
Lab pH	N/A	7.13	6.5	7.1	6.9	6.9
Total Suspended Solids (mg/L)	5	<5	0.5	10.0	2.5	2.7
Conductivity (uS/cm)	1	231	160.0	250.0	224.0	214.4
Chlorophyll-A Acidification Method (µg/L)	0.05	1.12	0.4	2.2	1.0	1.0

KL-5	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.005	0.003	0.135	0.006	0.022
Chloride (mg/L)	1	47	37.0	60.0	47.5	49.5
Lab pH	N/A	7.47	6.5	7.5	6.9	6.9
Total Suspended Solids (mg/L)	5	<5	1.0	2.5	2.5	2.3
Conductivity (uS/cm)	1	286	160.0	286.0	214.5	218.8
Chlorophyll-A Acidification Method (µg/L)	0.05	1.68	0.6	2.7	1.2	1.4

HWY 102-1	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.010	0.002	0.031	0.011	0.014
Chloride (mg/L)	1	61	12.0	61.0	31.5	34.1
Lab pH	N/A	6.94	5.3	6.9	6.6	6.4
Total Suspended Solids (mg/L)	5	<5	0.5	2.5	2.5	2.1
Conductivity (uS/cm)	1	306	88.0	306.0	155.0	173.8
Chlorophyll-A Acidification Method (µg/L)	0.05	1.11	0.3	8.5	0.8	1.6

HWY 102-2	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.014	0.003	0.201	0.022	0.056
Chloride (mg/L)	1	30	17.0	92.0	46.5	49.7
Lab pH	N/A	7.07	5.5	7.1	6.3	6.3
Total Suspended Solids (mg/L)	5	<5	2.5	194.0	5.5	30.6
Conductivity (uS/cm)	1	208	94.0	366.0	201.0	217.6
Chlorophyll-A Acidification Method (µg/L)	0.05	0.53	0.3	48.2	1.2	10.9

LSD	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.018	0.003	0.095	0.015	0.028
Chloride (mg/L)	1	20	20.0	36.0	24.0	26.0
Lab pH	N/A	6.99	6.4	7.0	6.7	6.7
Total Suspended Solids (mg/L)	5	6	2.5	69.0	7.5	14.6
Conductivity (uS/cm)	1	123	105.0	171.0	124.0	126.3
Chlorophyll-A Acidification Method (µg/L)	0.05	0.60	0.1	5.1	1.0	1.7

LU	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.021	0.008	0.046	0.026	0.025
Chloride (mg/L)	1	74	34.0	258.0	83.0	102.0
Lab pH	N/A	7.29	6.4	7.3	7.0	6.9
Total Suspended Solids (mg/L)	5	<5	2.5	13.0	2.5	4.5
Conductivity (uS/cm)	1	422	190.0	840.0	408.0	443.0
Chlorophyll-A Acidification Method (µg/L)	0.05	2.39	0.1	4.9	1.9	2.0

PML-1	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.012	0.002	0.099	0.020	0.027
Chloride (mg/L)	1	47	18.0	59.0	47.5	45.1
Lab pH	N/A	7.16	6.6	7.2	6.8	6.8
Total Suspended Solids (mg/L)	5	<5	0.5	104.0	6.0	17.7
Conductivity (uS/cm)	1	232	100.0	248.0	216.5	198.2
Chlorophyll-A Acidification Method (µg/L)	0.05	1.12	0.1	5.1	1.0	2.0

PML-2	RDL	Seasonal Results	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorous (mg/L)	0.002	0.012	0.001	0.026	0.007	0.009
Chloride (mg/L)	1	43	34.0	64.0	50.0	50.9
Lab pH	N/A	7.05	6.6	7.1	6.8	6.9
Total Suspended Solids (mg/L)	5	<5	0.5	11.0	2.5	3.0
Conductivity (uS/cm)	1	227	150.0	277.0	227.0	221.9
Chlorophyll-A Acidification Method (µg/L)	0.05	1.78	0.3	2.0	1.3	1.1

8. GRAPHS

Graphs were completed for all eleven (11) water quality monitoring stations including water quality data collected from 2009 to October 2018. Appendix F presents seasonal and annual graphs that illustrate concentrations of the following six (6) key water quality parameters selected by HRM:

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

The graphs allow for comparison between water quality sampling stations and identification of concentration increases (i.e. above applicable CCME guidelines). As many parameters show seasonal concentration fluctuations, the water quality data was also graphed showing only the concentrations for a given season.

It should be noted that where results were found to be less than the laboratory Reportable Detection Limit (<RDL), they were graphed as half the reportable detection limit (1/2 RDL value) as a conservative approach.

9. CONCLUSIONS

The 2018 autumn water quality monitoring event included the collection of surface water samples at eleven (11) water quality sampling stations for the analysis of inorganics, calculated parameters, standard metals and microbiological analyses. 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.

Total Phosphorous

The following five (5) monitoring stations reported total phosphorous concentrations above the HRM management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L):

- HWY102-2: 0.014 mg/L (equivalent to 14 µg/L)
- LSD: 0.018 mg/L (equivalent to 18 µg/L)
- LU: 0.021 mg/L (equivalent to 21 µg/L)
- PML1: 0.012 mg/L (equivalent to 12 µg/L)
- PML2: 0.012 mg/L (equivalent to 12 µg/L)

Field Measurements

- In-Situ pH values were well within the Health Canada Guideline for Recreational Water Quality of 5.0 - 9.0 pH for all eleven (11) of the stations. However, In-Situ pH values outside of the CCME-PAL-F recommended range of 6.5 - 9.0 were found at stations KL2 (5.84 pH) and LSD (5.90 pH).
- In-Situ dissolved oxygen concentrations were well within the CCME PAL-F recommended range of 5.5 - 9.5 mg/L for all stations, with the exception of LU: 9.79 mg/L
- In-Situ water temperature was recorded between 9.3°C and 13.1°C.
- In-Situ water conductivity was recorded between 67.2 µs/cm to 384.4 µs/cm.
- Secchi depth readings were collected at six (6) stations. Recorded values meet the Health Canada reference guideline of minimum of 1.2 meters (m): KL1 (2.1 m); KL2 (1.4 m); KL5 (3.01 m); PML-1 (2.4); and PML-2 (3.0 m).

General Chemistry and Metals

The following parameters reported concentrations above the recommended Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (CCME-PAL-F, edition 2015) and/or the Nova Scotia Environment (NSE) Environmental Quality Standards (EQS) for Surface Water, EQS for Contaminated Sites (NSE 2014):

- Laboratory pH was reported at all eleven (11) stations well within Health Canada range of 5.0-9.0 for Recreational Water Quality. However, station KL2 (6.3 pH) was outside the CCME-PAL-F recommended range of 6.5-9.0 pH.
- Copper concentrations exceeded the NSE EQS and CCME-PAL-F limit of 2 µg/L at stations HWY-102-1 (3 µg/L) and LU (5.0 µg/L).
- Iron concentrations exceeded the NSE EQS and CCME-PAL-F limit of 300 µg/L at stations KL2 (336 µg/L) and HWY102-1 (403 µg/L)
- Zinc concentrations exceeded the NSE EQS and CCME-PAL-F limit of 30 µg/L at stations HWY102-2 (69 µg/L) and LU (38 µg/L)

Microbiological

The Heath Canada guideline of ≤ 400 CFU/100 mL of E.Coli was met at all eleven (11) stations monitored during the 2018 autumn event.

There is no a guideline for Total Coliform (TC) in regards to recreational water quality. All monitoring stations reported TC concentrations above the Lab RDL of 1 CFU/100mL. Reported TC concentrations ranged from 81 CFU/100ml to 8,000 CFU/100ml.

10. LIMITATION

Related to the Chlorophyll A analyses, the Welschmeyer Method completed by Dalhousie is not presented in this report due to laboratory's instrument failure. The Chlorophyll A results presented in this report are based only on Acidification Technique, which is what the laboratory of Dalhousie University is reliant on reporting.

11. CLOSURE

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. The report has been prepared in accordance with the Scope of Work and agreement between SNCL and the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SNCL.

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 findings, observations, reported data 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.

This report was prepared by Maria Gutierrez, BSc, MEM and Cally Baxter, BSc, EPt, and reviewed and approved by Michael Smith, AScT, B.Tech, EP.

12. 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 guidelines for the Protection of Aquatic Life Freshwater.

Health Canada guidelines for Canadian Recreational Water Quality, 2012, Third Edition.

Nova Scotia Environment, Notification of Contamination Protocol, Table 3 Tier 1 EQS for Surface Water, Revision July 2013

Appendix A

Instrument Calibration Report

Open Road Environmental Limited

YSI Professional Plus

Serial Number 18G102273 (Quattro)

Calibration Certificate

3 Point Calibration pH (4.00, 7.00, 10.00)	*Calibration solution*	*Specific Conductivity 12880 uS/cm*	*DO 100% @22.0 Deg.C*
pH 4.00 pass 155.9mV	*Lot#S180501018 Exp. May-20*	*pass*	*pass*
pH 7.00 pass 30.2mV	*Lot#S180315008 Exp. Mar-20*		
pH 10.00 pass -167.4mV	*Lot#S180104003 Exp. Jul-19*		

October 14, 2018

Original signed

Ghislain Pitre, CET

Appendix B

Field Reports

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partially Cloudy
Air Temperature:	5°C
Cloud Cover :	>90%
Wildlife Sightings:	None
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):	**17/10/18**
Time (hh:mm):	9 am
Sample Depth (m):	< 1m
pH:	6.84
Dissolved Oxygen (mg/L):	8.61
Secchi Depth (m):	2.5m
Water Temperature (degrees Celsius):	12.8°C
Conductivity (µs/cm):	253.7

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partially Cloudy
Air Temperature:	5°C
Cloud Cover:	30%
Wildlife Sightings:	None
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):	**17/10/18**
Time (hh:mm):	10 am
Sample Depth (m):	~ 0.5 m
pH:	5.84
Dissolved Oxygen (mg/L):	7.54
Secchi Depth (m):	1.4
Water Temperature (degrees Celsius):	10.3
Conductivity (µs/cm):	67.2

Additional Comments / Notes

- Water level is high, stream moving fast.

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partly cloudy
Air Temperature:	9°C
Cloud Cover:	80%
Wildlife Sightings:	None
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):	17/10/18
Time (hh:mm):	11:30 am
Sample Depth (m):	~ 0.25 m
pH:	6.64
Dissolved Oxygen (mg/L):	8.64
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	12.4°C
Conductivity (µs/cm):	209.8

Additional Comments / Notes

- Water level is high, fast moving water over dam.

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partly cloudy
Air Temperature:	9°C
Cloud Cover:	80%
Wildlife Sightings:	Squirrels
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):	17/10/18
Time (hh:mm):	11:45 am
Sample Depth (m):	0.5 m
pH:	6.91
Dissolved Oxygen (mg/L):	8.46
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	12.7°C
Conductivity (µs/cm):	210.6

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partly cloudy
Air Temperature:	5°C
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):	17/10/18
Time (hh:mm):	9:30 am
Sample Depth (m):	<1m
pH:	6.67
Dissolved Oxygen (mg/L):	7.58 mg/L
Secchi Depth (m):	**3.77**
Water Temperature (degrees Celsius):	13.1°C
Conductivity (µs/cm):	236.4

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Light rain
Air Temperature:	10°C
Cloud Cover:	100%
Wildlife Sightings:	None
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):	17/10/18
Time (hh:mm):	3:40 pm
Sample Depth (m):	< 1m
pH:	6.70
Dissolved Oxygen (mg/L):	6.06
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	10.6
Conductivity (µs/cm):	189.4

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Cloudy
Air Temperature:	10°C
Cloud Cover:	90%
Wildlife Sightings:	None.
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)	17/10/18
Time (hh:mm):	1:40 pm
Sample Depth (m):	0.25
pH:	7.24
Dissolved Oxygen (mg/L):	5.62
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	10.6°C
Conductivity (µs/cm):	246.4

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Partly Cloudy
Air Temperature:	9°C
Cloud Cover:	50%
Wildlife Sightings:	Frogs
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):	17/10/18
Time (hh:mm):	10:50 am
Sample Depth (m):	~0.25
pH:	5.90
Dissolved Oxygen (mg/L):	7.24
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	9.3°C
Conductivity (µs/cm):	108.1

Additional Comments / Notes

N/A

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Cloudy
Air Temperature:	10 °C
Cloud Cover:	>90%
Wildlife Sightings:	None
Site Accessibility: Yes, Accessible	From Larry Uteck Road
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):	17/10/18
Time (hh:mm):	12:25 pm
Sample Depth (m):	< 1m
pH:	7.09
Dissolved Oxygen (mg/L):	9.79
Secchi Depth (m):	N/A
Water Temperature (degrees Celsius):	12.4°C
Conductivity (µs/cm):	384.4

Additional Comments / Notes

- Strong/Bad odour

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Overcast
Air Temperature:	11°C
Cloud Cover:	100%
Wildlife Sightings:	Birds
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):	17/10/18
Time (hh:mm):	2:45 pm
Sample Depth (m):	0.5m
pH:	7.19
Dissolved Oxygen (mg/L):	8.36
Secchi Depth (m):	2.9
Water Temperature (degrees Celsius):	12.3°C
Conductivity (µs/cm):	208.1

Additional Comments / Notes

- Potentially seek a new access point as this one is challenging with the boat.

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:	Maria Gutierrez / Cally Baxter	

Site Conditions

Weather:	Cloudy
Air Temperature:	11°C
Cloud Cover:	100%
Wildlife Sightings:	None
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):	17/10/18
Time (hh:mm):	2:15 pm
Sample Depth (m):	<1m
pH:	7
Dissolved Oxygen (mg/L):	8.70
Secchi Depth (m):	2.2
Water Temperature (degrees Celsius):	12.2
Conductivity (µs/cm):	297.3

Additional Comments / Notes

- N/A

Appendix C

Site Photographs

Photo 1: KL1 Kearney Lake Sample Location

Photo 2: KL2 Kearney Lake Sample Location.

Photo 3: L3 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

Appendix D

Summary Table Results (Seasonal and Historical)

TABLE D1: 2018 Autumn Results, Bedford West Water Quality Sampling Program

Tested Parameters		RDL	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD	LU	PML-1	PML-2
Sampling Date						2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17	2018/10/17
Sampling Time						9:00 AM	10:00 AM	11:30 AM	11:45 AM	9:30 AM	15:40 00 PM	14:15 PM	10:50 AM	12:25 PM	14:45 PM	14:15 PM
Field Data (in Situ)																
Secchi Depth	Meters	--	--	minimum of 1 2	--	2 5	1.4	N/A	N/A	3.8	N/A	N/A	N/A	N/A	2.9	2 2
Water Temp	Celsius	--	--	--	--	12.8	10 3	12.4	12.7	13.1	10.6	10.6	9.3	12.4	12.3	12.2
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5	8.6	7.5	8.6	8 5	7.6	6.1	5.6	7.2	**9.8**	8.4	8.7
pH	pH	--	--	5.0-9.0	6.5 - 9.0	6 8	**5.8**	6.6	6 9	6.67	6.7	7.2	**5.9**	7.1	7.2	7 0
Specific Conductance (µs/cm)	uS/cm	--	--	--	--	253.7	67 2	209 8	210.6	236.4	189.4	246.4	108.1	384.4	208.1	297.3
Inorganic Parameters																
Alkalinity	mg/L	5	--	--	--	7 0	<5	7.0	8 0	26 0	12.0	13 0	9.0	13 0	8.0	8 0
Chloride	mg/L	1	--	--	120	55.0	11 0	46.0	47.0	47 0	61.0	30 0	20 0	74 0	47.0	43.0
True Color	TCU	5	--	--	--	18.0	123.0	27.0	16.0	12 0	68.0	85 0	65 0	24 0	31.0	21.0
Nitrate + Nitrite as N	mg/L	0.05	--	--	--	0 2	<0.05	0.1	0.1	0.4	0.2	0.8	0.1	1.3	0.2	0 2
Nitrate as N	mg/L	0.05	--	--	13	0 2	<0.05	0.1	0.1	0.4	0.2	0.8	0.1	1.3	0.2	0 2
Nitrite as N	mg/L	0.05	--	--	0.06	<0 05	<0.05	<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	--	--	18	0.1	0.1	0 03	0.03	0.05	<0.03	0.06	<0.03	<0.03	<0.03	0.05
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Total Organic Carbon	mg/L	0 5	--	--	--	4 0	14 0	4.0	4 0	3.0	7.0	8.0	8.0	5.0	4.0	4 0
Ortho-Phosphate as 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 01
pH			--	5.0-9.0	6.5 - 9.0	7.1	**6.3**	7.1	7.1	7.5	6.9	7.1	7.0	7.3	7.2	7.1
Calcium	mg/L	0.1	--	--	--	6 9	2.9	8.4	7.7	7.6	9.9	16 5	3.5	14 9	8.4	7.7
Magnesium	mg/L	0.1	--	--	--	1 3	0.8	1.4	1 3	1.2	1.8	1.9	0.9	2.1	1.4	1 3
Total Phosphorus	mg/L	0.002	--	--	0.01	0.008	0 004	0.006	0.004	0 005	0.010	**0.014**	**0.018**	**0.021**	**0.012**	**0.012**
Potassium	mg/L	0.1	--	--	--	0 8	0.6	1.1	1 0	0.9	1.4	1.7	0.8	2.3	1.1	1.1
Sodium	mg/L	0.1	--	--	--	31.7	11 8	39.9	40.6	41.7	47.9	29.4	15.4	69 9	39.2	39.6
Reactive Silica as SiO2	mg/L	0 5	--	--	--	1.7	3.6	1.9	2 0	3.4	4.6	4.6	3.3	4.7	2.3	2 3
Total Suspended Solids	mg/L	5	--	--	Comment 1	<5	<5	<5	<5	<5	<5	<5	6.0	<5	<5	<5
Sulphate	mg/L	2	--	--	--	9 0	3.0	7.0	8 0	11 0	11.0	16 0	5.0	24 0	9.0	8 0
Turbidity	NTU	0.1	--	50	--	2.1	1.1	1.2	1.7	0.7	3.2	1.1	2.5	4.5	2.1	1 2
Conductivity	umho/cm	1	--	--	--	215.0	70 0	232 0	231.0	286.0	306 0	208.0	123.0	422.0	232 0	227.0
Calculated Parameters																
Anion Sum	me/L		--	--	--	1 9	0.4	1.6	1.7	2.1	2.2	1.5	0.9	2.9	1.7	1.6
Bicarb. Alkalinity (as CaCO3)	mg/L	5	--	--	--	7 0	<5	<5	8 0	26 0	12.0	13 0	9.0	13 0	8.0	8 0
Calculated TDS	mg/L	1	--	--	--	110.0	31 0	109 0	111.0	127.0	142 0	107.0	52 0	201.0	112 0	107.0
Carb. Alkalinity (as CaCO3)	mg/L	10	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation sum	me/L	--	--	--	--	1 9	0.8	2.3	2 3	2.3	2.8	2.3	1.0	4.1	2.3	2 3
Hardness	mg/L	--	--	--	--	22.6	10 5	26.7	24.6	23 9	32.1	49 0	12.4	45 9	26.7	24.6
% Difference/ Ion Balance (NS)	%	--	--	--	--	0.4	36.7	18.4	16.2	5.0	12.1	21 8	6.6	15 9	14.9	18.7
Langelier Index (@20C)	NA	--	--	--	--	-2.8	-4.1	-2.7	-2.7	-1.8	-2.6	-2.2	-3.1	-2.0	-2.6	-2 8
Langelier Index (@ 4C)	NA	--	--	--	--	-3.2	-4.4	-3.0	-3 0	-2.2	-2.9	-2.5	-3.4	-2.4	-2.9	-3.1
Saturation pH (@ 20C)	NA	--	--	--	--	9 9	10.4	9.8	9 8	9.3	9.5	9.3	10.1	9.3	9.8	9 8
Saturation pH (@ 4C)	NA	--	--	--	--	10.2	10.7	10.1	10.1	9.6	9.9	9.6	10.4	9.7	10.1	10.1
Metals (ICP-MS)																
Total Aluminum	ug/L	5	5	--	100 ug/L (based on pH)	--	--	--	--	--	--	--	--	--	--	--
Total Antimony	ug/L	2	20	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Arsenic	ug/L	2	5.0	--	5	--	--	--	--	--	--	--	--	--	--	--
Total Barium	ug/L	5	1000	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Beryllium	ug/L	2	5.3	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Bismuth	ug/L	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Boron	ug/L	5	1200	--	1500	--	--	--	--	--	--	--	--	--	--	--
Total Cadmium	ug/L	0.09	0 01	--	0.09	--	--	--	--	--	--	--	--	--	--	--
Total Chromium	ug/L	1	---	--	1	--	--	--	--	--	--	--	--	--	--	--
Total Cobalt	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Copper	ug/L	1	2	--	2 ug/L (based on hardness)	2 0	1.0	1.0	1 0	1.0	**3.0**	2.0	1.0	**5.0**	1.0	2 0
Total Iron	ug/L	50	300	--	300	142.0	**336.0**	<50	78.0	<50	**403.0**	93 0	164.0	206.0	82.0	165.0
Total Lead	ug/L	0 5	1	--	1 ug/L (base on hardness)	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	ug/L	2	820	--	--	28.0	29 0	22.0	43.0	14 0	71.0	10 0	58 0	40 0	22.0	74.0
Total Molybdenum	ug/L	2	73	--	73	--	--	--	--	--	--	--	--	--	--	--
Total Nickel	ug/L	2	25	--	25 ug/L (base on hardness)	--	--	--	--	--	--	--	--	--	--	--
Total Selenium	ug/L	1	1.0	--	1	--	--	--	--	--	--	--	--	--	--	--
Total Silver	ug/L	0.1	0.1	--	0.25	--	--	--	--	--	--	--	--	--	--	--
Total Strontium	ug/L	5	21000	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Thallium	ug/L	0.1	0.8	--	0.8	--	--	--	--	--	--	--	--	--	--	--
Total Tin	ug/L	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Titanium	ug/L	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Uranium	ug/L	0.1	300	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Vanadium	ug/L	2	6	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Zinc	ug/L	5	30	--	30	19.0	20 0	<5	7 0	7.0	12.0	**69.0**	<5	**38.0**	<5	6 0

Tested Parameters		RDL	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD	LU	PML-1	PML-2
Microbiological Parameters																
Total Coliforms	CFU/100 mL	1 to 10	--	--	--	157.0	140.0	5,020.0	8,000 0	6,000.0	370 0	81 0	2,380 0	330.0	4,000.0	3,030.0
E. Coli	CFU/100 mL	1 to 10	--	400	--	61.0	50 0	20.0	12.0	11 0	2.0	3.0	20 0	30 0	13.0	30.0
Chlorophyll A - Acidification Method	ug/L	0.05	--	--	--	1.6	0.7	1.3	1.1	1.7	1.1	0.5	0.6	2.4	1.1	1 8
Chlorophyll A - Welschmeyer Method	ug/L	0.05	--	--	--	*	*	*	*	*	*	*	*	*	*	*

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / no parameter tested.
NDOGT- No Data Overgrown With Target
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
Health Canada Guidelines for Canadian
CCME PAL-F Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015)
CCME Phosphorus Trigger Range (Applied) of 0.01 mg/L
CCME PAL-F Guidelines for Aluminum, Lead, Copper and Nickel vary based on reported pH and water hardness.
CCME PAL-F Guideline for Ammonia-N vary base on water pH and Temperature. The value is converted to mg/L total ammonia-N by multiplying by 0.8224
Comment 1: CCME PAL-F reference values between 25-250 mg/L, and >250 mg/L.

Bold and Black Shaded Concentration exceeds CCME FWAL applicable guideline.

Underlined and Black Shaded Concentration exceeds NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality (Reference Guidelines)

TABLE D2 H storical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Hea th Canada Guideline for Recreat onal Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Tr gger Range (Applied)	Kearney Lake																							
Sample S tes							KL1																							
Sampl ng Date	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	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Sampl ng T me	hh mm	--					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	12 30	9 30	7 50	13 20	8 30	9 30 AM	9 35 AM	9 15 AM	7 50 AM	9 00 AM
FIELD DATA																																		
Secch. Depth	Mete s	--	--	1.2	--		4.1	4 2	5.0	N/A	5.0	4 9	2.4	3.2	2.4	2.4	5.4	N/A	2.5	2.0	2.9	2.4	2.7	2.5	NCC	N/A	2.2	1.8	2.1	2.5	2.1	2.2	2.2	2.1	2.1	2.5
Wate Temp	Cels us	--	--	--	--		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	14.1	26.1	9.4	12.8	22.2	11 9	16.6	23.2	14 1	12.2	24.2	12.8
D ssolved Oxygen	mg/L	--	--	--	5.5 - 9 5		10.8	8 2	7.0	9 1	7.9	10.5	10.7	8.2	9.2	9.0	7.9	8.7	9.8	8.6	8.3	15.3	7.2	8.1	9.6	8.1	7.4	14.0	10.3	12 1	8.3	7.9	8.2	11.1	6.7	8.6
pH (n S tu)	pH	--	--	5.0-9.0	6.5 - 9 0		6.2	6 8	6.7	6.7	7 2	7.3	6 6	6.6	6.2	6.0	8.7	6.9	6.3	6.3	8.2	6.4	6.7	7.5	6.4	8.3	7.0	7.0	8.3	4.6	6.2	7.5	7.0	7.8	7.9	7.5	6.8
Spec f c Conductance	uS/cm	--	--	--	--		263.0	299.0	261.0	248.0	242.0	218.7	288.0	178.6	146.3	277.0	279.0	198.1	243.0	216.5	217.9	547.0	341.0	223.0	0.2	298 3	238.5	239.0	298.0	212.4	240.0	292.0	312.0	203 1	288.2	253.7
INORGANICS																																		
Total Alkal n ty (as CaCO3)	mg/L	5	--	--	--		6	8	8	7	8	6	5	9	7	24	7	5	5	5	8	30	14	5	5	6	7	5	8	6	5	8	10	5	9	7.0
D ssolved Chlo de (Cl)	mg/L	1	--	--	120		81	74	64	62	60	55	73	45	33	66	70	50	66	59	48	80	76	46	60	62	58	55	57	45	71	73	60	53	54	55.0
Colou	TCU	5	--	--	--		18	18	16	26	8	21	28	40	45	50	11	20	11	37	20	13	8	23	37	8	22	31	17	18	15	14	12	42	16	18.0
N t te N t ate	mg/L	0 05	--	--	--		0.18	0.09	0.12	0.21	0.16	0.23	0.20	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 17	0.10	0.15	0.13	0.20	0 29	0.10	0.26	0 16	0.2
N t ate (N)	mg/L	0 05	--	--	13		0.18	--	--	0 21	0.16	--	0.20	--	--	0.20	0.09	0.10	0.18	0.14	0.19	0.11	0 11	0.08	0 15	0.15	0 17	0.10	0.08	0.13	0.08	0 08	0.10	0.16	0 07	0.2
N t te (N)	mg/L	0 05	--	--	0.06		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	0.05	0.07	0.05	0.12	0 21	0.05	0.10	0 09	0.05
N t ogen (Ammon a N t ogen) *	mg/L	0 03	--	--	18		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	0.03	0.05	0.09	0.03	0.03	0.03	0.04	0.03	0.08	0.1
Total Kjeldahl N t ogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.9	3.1	0.4	--	0.7	0.4	1.1	0.4	0.4	0.2	4.5	0.4	0.7	0.4	0.6	0.4	0.4	0.4	0.4	0.4
Total O gan c Ca bon	mg/L	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	5.5	4.3	3.4	7.3	4.5	4.6	4.8	5.1	3.1	4.0
O thophosphate (as 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	0.01	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	0.01	0.01	0.01	0.01	0.01	0.01
pH (Lab)	pH	N/A	--	5.0-9.0	6.5 - 9 0		6.9	6 7	6.7	6.7	6 9	7.0	6 8	6.5	6.5	6.5	6.7	7 2	6.9	6 8	6.9	6.9	6.7	7.1	6.4	6.6	7.0	7.0	6.6	7.2	6.8	6.6	7.1	7.0	6.71	7.31	7.1
Total Calc um (Ca)	mg/L	0.1	--	--	--		9.2	8 5	7.2	7 7	8.7	8 3	7.7	4.8	5.3	6.8	8.4	6.3	7.5	6.6	6.5	8.1	11.0	6.0	6 400.0	7.9	6.1	6.8	8.0	6.3	8.6	7.1	8.3	5.8	7.2	6.9
Total Magnes um (Mg)	mg/L	0.1	--	--	--		1.5	1 4	1.2	1 4	1.4	1 3	1.3	0.9	1.1	1.1	1.5	1.5	1.1	1.2	1.2	1.6	1.6	0.9	920.0	1.3	0.9	1.1	1.1	1.2	1.3	1.2	1.3	1.0	1.2	1.3
Total Phosphо us	mg/L	0.002	--	--	--	0.010	0.020	0.020	0.002	0.009	0.007	0.005	0.008	0.012	0.009	0.017	0.043	0.007	0.007	0.011	0.008	0.011	0.026	0.013	0.008	0.002	0.015	0.024	0.005	0.008	0.010	0.010	0.005	0.012	0.008
Total Potass um (K)	mg/L	0.1	--	--	--		1.1	0 9	1.3	0 9	0.9	0 9	0 8	0.8	0 9	0.7	0 9	0 9	0.8	0.7	1.1	0 9	1.6	0.7	680.0	0 9	0.7	0.7	0 9	0.8	1.0	0 9	1.2	0.7	1.0	0.8
Total Sod ium (Na)	mg/L	0.1	--	--	--		51.0	46.0	37.0	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	33.0	43.3	39.8	35.5	32.2	31 0	44.9	50.3	35 7	36.4	34.7	31.7
React ve S l ca (S O2)	mg/L	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	2.7	2.8	2.0	1.6	2.0	1.6	1.8	2.6	1.7	1.7
Total Suspended Sol ds	mg/L	5	--	--	Comment 1		1	1	1	4	17	3	2	2	3	5	5	5	5	5	5	5	5	5	1 0	5	5	38	5	5	5	5	5	5	5	5
D ssolved Sulphate (SO4)	mg/L	2	--	--	--		14	13	12	11	11	11	12	10	8	8	9	9	11	9	9	12	11	7	9	10	8	10	10	10	11	9	10	8	7.0	9.0
Tu b d ty (NTU)	NTU	0.1	--	50	--		0.7	0 8	1.0	1 3	0.6	1 0	1.0	1.0	0.9	2.4	0.8	1.3	1.6	3.3	0.5	2.9	0.7	1.9	0.8	1.9	1.1	10.6	0.9	2.6	1.4	1.1	0.8	1.3	0.7	2.1
Conduct v ty (uS/cm)	µS/cm	1	--	--	--		310	290	250	240	240	230	290	180	140	246	274	196	259	241	212	290	339	235	220	257	244	212	270	161	271	260	249	243	261	215.0
Calculated Parameters																																				
An on Sum	me/L	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	1 95	1.87	1.99	1.61	2.25	2 43	2.11	1.68	1 86	1.9
B ca b. Alkal n ty (calc. as CaCO3)	mg/L	5	--	--	--		6	8	8	7	8	6	1	9	7	24	7	5	5	5	8	30	14	5	5	6	7	5	8	6	5	8	10	5	9	7.0
Calculated TDS	mg/L	1	--	--	--		166	151	131	123	125	118	143	92	77	139	137	98	124	104	103	172	165	99	130	130	119	113	115	99	139	148	123	106	112	110.0
Ca b. Alkal n ty (calc. as CaCO3)	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	10	10	10	10	10	10	10	10	10
Cat on Sum	me/L	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	2 14	2.03	1.93	1.82	2.54	2 67	2.12	2.00	2 01	1.9
Ha dness (CaCO3)	mg/L	N/A	--	--	--		29.00	27 00	23.00	25 00	27.00	26 00	24.00	16.00	18.00	21.50	27.20	21 90	23.30	21.40	21.20	26.80	34.10	18.70	20.00	25.10	18.90	21.50	24.50	20.70	26.80	22.70	26.10	18.6	22.9	22.6
Ion Balance (% D ffe ence)	%	N/A	--	--	--		2.33	0.98	2.53	4.95	0.48	2.80	1.89	11.00	0.79	5.90	2.10	5.30	0.70	7.30	3.40	5.80	7 50	17.20	3 66	7.50	4 50	4.10	1 50	6.20	6.10	4 80	0.20	8.6	3.8	0.4
Langel e Index (@ 20C)	N/A	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	-2.99	-3.42	-2.56	-3.20	-3.33	-2.78	-2.68	-3 42	-2.47	-2 8
Langel e Index (@ 4C)	N/A	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	-3.29	-3.74	-2.88	-3.52	-3.65	-3.10	-3.00	-3 74	-2.79	-3 2
Satu at on pH (@ 20C)	N/A	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	10.00	10.10	9.87	9 23	9 42	10.10	9 83	9.92	9 96	10.10	9.79	10.00	9.97	9 85	9.68	10.1	9 78	9.9
Satu at on pH (@ 4C)	N/A	N/A	--	--	--		9.87	9.77	9.87	9.88	9.76	9.91	NC	9.94	9.98	9.71	10.20	10.40	10.30	10.40	10.20	9.55	9 74	10.40	10.10	10.20	10.30	10.40	10.10	10.30	10.30	10.20	10.00	10.4	10.1	10.2
Metals [ICP-MS]																																				
Total Alum num (A)	µg/L	5	5	--	5 - 100		230	--	--	289	48	--	338	--	--	321	43	168	191	120	56	229	42	155	100	--	88	206	--	--	158	41	46	169	29	--
Total Ant mony (Sb)	µg/L	2	20	--	--		2	--	--	1.0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total A sen c (As)	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	2	--	--	2	--	2	2	2	--
Total Ba um (Ba)	µg/L	5	1000	--	--		16	--	--	19	16	--	13	--	--	12	15	9	12	7	16	14	20	9	16	--	17	14	--	--	16	--	17	12	16	--
Total Be yll um (Be)	µg/L	2	5.3	--	--		2	--	--	1.0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total B smuth (B)	µg/L	2	--	--	--		2	--	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Bo on (B)	µg/L	5	1200	--	1500		8	--	--	11	9	--	50	--	--	5	11	33	6	10	9	7	22	10	50	--	5	8	--	--	5	--	26	5	10	--
Total Cadm um (Cd)	µg/L	0.017	0.01	--	0.09		0.3	--	--	0 051	0.017	--	0.056	--	--	0.032	0.027	0.021	0.020	0.017	0.017	0.037	0.017	0.025	--	--	0.197	0.029	--	--	0.058	--	0.017	0.09	0.09	--
Total Ch omium (C)	µg/L	1	--	--	1		2	--	--	1.0	1.0	--	1.0	--	--	1	1	1	1	1	1	4	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total Cobalt (Co)	µg/L	1	10	--	--		1	--	--	1	0.40	--	1	--	--	1	1	1	1	1	1	1	1	1	0.40	--	1	1	--	--	1	--	1	1	1	--
Total Copper (Cu)	µg/L	1	2	--	2		2	--	--	8	2.0	2.0	2.0	2.0	2.0	2	2	2	2	1	1	1	1	1	2.0	1	2	1	1	1	1	2	1	1	1	2.0
Total Iron (Fe)	µg/L	50	300	--	300		130	--	--	313	62	125	177	162	344	229	137	195	207	132	92	147	124	168	110	157	81	149	62	269	78	78	70	116	96	142	142.0
Total Lead (Pb)	µg/L	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	--	0.5	0.5	--	--	1.3	--	0 5	1.3	0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		100	--	--	79	57	59	78	52	56	48	65	68	73	48	24	48	115	42	39	41	22	47	23	45	46	31	17	28	49	28.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		2	--	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total N ckel (N)	µg/L	2	25	--	25 - 150		5	--	--	3	2.0	--	3	--	--	2	2	2	2	2	2	3	2	3	2.0	--	2	3	--	--	15	--	2	2	2	--
Total Selen um (Se)	µg/L	1	1.0	--	1		2	--	--	1.0	1.0	--	1.0	--	--	1	1	1	1	1	1	1	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total S lve (Ag)	µg/L	0.1	0.1	--	0.25		0.5	--	--	0.1	0.1	--	0.1	--	--	0 1	0.1	0 1	0.1	0 1	0.1	0.1	0.1	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0 1	0.1	0.1	--
Total Sl ont um (S)	µg/L	5	21000	--	--		46	--	--	39	38	--	36	--	--	32	41	32	37	33	30	40	45	26	29	--	19	30	--	--	38	--	40	26	38	--
Total Thall um (Tl)	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	0.1	0.1	0.1	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0 1	0.1	0.1	--
Total T n (Sn)	µg/L	2	--	--	--		2	--	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2	--	2	2	--	--	2	--	2	2	2	--
Total U an um (U)	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	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0 1	0.1	0.1	--
Total Vanad um (V)	µg/L	2	6	--	--		2	--	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2	--	2	2	--	--	2	--	2	2	2	--
Total Z nc (Zn)	µg/L	5	30	--	30		27	--	--	14	8	11	12	13	10	5	5	11	11	6	5	14	5	9	13	8	5	11	5	19	54	5	6	8	5	19.0
MICROBIOLOGICAL																																				
Total Col fo m	MPN/100mL	1	--	--	--		200	65	--	>250	63	>250	91	>250	--	2,420	>2420	1,120	1 200	866	488	525	1,550	>2420	---	980	122	866	548	>2420	299	488	154	14	611	157 0
E. col	MPN/100mL	1	--	400	--		39	24	--	9	15	37	8	>250	100	41	11	17	48	2	7	1	15	28	60	24	6	4	33	99	29	18	3	5	11	61.0
Chlo ophy l A - Ac d f cat on method	µg/L	0 05	--	--	--		0.53	0.79	1.11	1.73	1.47	0.99	0.76	1.44	1.36	0.62	2.30	1.54	1.22	1.40	1.19	0.40	0 41	0.84	0 64	1.14	1 79	2.76	0.90	2 08	1.45	1 75	1.10	1.91	1 26	1.6
Chlo ophy l A - Welschmeye method	µg/L	0 05	--	--	--		0.48	0.69	1.17	1.61	1.42	0.81	0.69	1.15	1.14	0.63	2.30	2.16	1.40	1.40	1.19	1.32	0 36	0.80	0 62	1.11	0 95	3.48	1.15	2.19	2.55	1 87	1.18	3.09	--	*

Notes

N/A - Not Appl cable NC - Not Calculable NCC Not Collected
RDL = Repo ted Detect on L m t (eg esents most ecent sampl ng event)
-- " = no gu del ne ava lable / Not Tested.
CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)
CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.
Comment 1 CCME PAL-F efe ence values between 25-250 mg/L, and >250 mg/L.
Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009)
Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate
(*) Chlo ophyll A - Welschmeye Method not completed due to labo ato y s nst ument fa lu e.

Bold (black shaded) = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Under l ned (black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2 Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guidel ne for Recreational Water Qual ty (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Appl ed)	Kearney Lake																							
Sample S tes							KL2																							
Sampl ng Date	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	2013/08/15	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	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Sampl ng T me	hh mm	--					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	13 05	10 30	8 30	12 50	10 47	11 15 AM	10 30 AM	11 00 AM	10 10 AM	10 00 AM
FIELD DATA																																			
Secch Depth	Mete s	--	--	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	1 3	2.1	1 8	1.9	2 0	1.5	1.2	2.1	1.4	1.4
Wate Temp	Cels us	--	--	--	--		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	13.1	24.7	8 1	10.7	20.3	10.2	15.7	21.2	10.6	11 7	21.6	10.3
D ssolved Oxygen	mg/L	--	--	--	5.5 - 9.5		10.2	8.5	5.7	6.3	4.7	9.6	9.7	7.1	8.4	6.5	5.8	7.6	9.4	6.4	7.4	14.9	7 0	7.7	8 4	7.3	7 1	7.9	4 2	9.7	9 7	6.6	6.2	9.4	4.2	7.5
pH (n S tu)	pH	--	--	5.0-9.0	6.5 - 9.0		6.3	6.4	6.2	6.6	7.0	6.3	6.8	5.9	5.6	7.7	6.4	6.3	5.8	7.5	5.6	6.6	7 2	5.8	6 4	5.9	6 4	7.6	6 9	5 5	6 7	6 0	6.3	6 2	5.2	5.4
Spec f c Conductance	uS/cm	--	--	--	--		46.0	106.0	89.2	198.5	104.0	75 1	79.7	66.7	54.3	58.0	96.6	61.1	77.9	65.3	64.5	188.0	266.0	63.0	0 1	107.9	73.6	82.0	117.0	103.7	78.0	114.0	109.0	57 4	106.9	67.2
NORGANICS																																			
Total Alkal n ty (as CaCO3)	mg/L	5	--	--	--		8	8	8	8	7	5	5	7	5	20	5	8	5	5	5	29	7	28	5.0	7	5	5	10	6	5	12	9	5	11	5
D ssolved Chlo de Cl)	mg/L	1	--	--	120		48	48	48	48	25	17	19	14	10	16	20	12	19	21	14	20	17	12	15	14	12	17	26	30	20	19	19	12	19	11.0
Colou	TCU	5	--	--	--		20	20	20	20	63	95	80	110	120	52	60	94	37	90	71	25	44	168	50	63	61	47	48	93	46	46	57	82	59	123 0
N t he N t ate	mg/L	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	0.06	0.08	0.05	0.05	0.06	0.19	0.05	0.08	0.05	0.07	0.05	0.05
N t ate (N)	mg/L	0.05	--	--	13		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	0.06	0.08	0 05	0.05	0 05	0.19	0 05	0.08	0.05	0.07	0.05	0.05
N t te (N)	mg/L	0.05	--	--	0 06		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 05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05
N t ogen (Ammon a N t ogen) *	mg/L	0.03	--	--	18		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 03	0.05	0.06	0.03	0 03	0.03	0.04	0.04	0.06	0.1
Total Kjeldahl N t ogen as N	mg/L	0 4	--	--	--		--	--	--	--	--	--	--	--	--	0.4	2.2	0.7	--	1.1	0.4	0.4	0 4	0 4	0.8	0 8	0.4	0 9	0.5	0.4	0.5	0.4	0.4	0.4	0.4
Total O gan c Ca bon	mg/L	0 5	--	--	--		4.3	4.3	4.3	4.3	6.6	9.7	6.5	10.0	12.0	8.1	7.1	10.9	7.5	11.1	10.9	6.2	6 6	12.9	4 0	13.3	14.0	6.2	7 0	13.2	8 5	8.2	8.5	9.0	6.6	14.0
D thophosphate (as 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	0.09	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	0 01	0.01	0.01	0.01	0.01	0.01
pH (Lab)	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.9	6.9	6.9	6.9	6.9	6.8	6.1	6.4	6.1	6.5	6.7	6.5	6.4	6.6	6.3	6.5	6.9	6.1	6.1	7.0	6 9	6.8	6 9	6.7	6 9	6.9	6.7	6.46	7.04	6.3
Total Calc um (Ca)	mg/L	0 1	--	--	--		6.5	6.5	6.5	6.5	6.5	4.1	3.6	2.5	2.5	2.2	2.4	3.6	2.9	2.7	2.5	2.4	3.4	4 0	2.4	2,600 0	3.4	1 1	2.9	4 5	5.6	3.6	4.3	3.9	2.3	4.2	2.9
Total Magnes um (Mg)	mg/L	0 1	--	--	--		1.2	1.2	1.2	1.2	1.0	0.8	0.6	0.6	0.4	0.7	1.0	1.0	0.7	0.5	0.8	1.1	1 0	0.6	640.0	0.9	0 7	0.7	1 1	1.5	1 0	1.2	0.9	0.7	1.1	0.8
Total Phospho us	mg/L	0.002	--	--	--	0.010	0.029	0.030	0.020	0.009	0.009	0.009	0.009	0.008	0.013	0.021	0.054	0.013	0.010	0.020	0.029	0.013	0.009	0.029	0.008	0.012	0.008	0.009	0.014	0.011	0.012	0.028	0.010	0.014	0.013	0.004
Total Potass um (K)	mg/L	0 1	--	--	--		1.1	1.1	1.1	1.1	0.6	0.8	0.5	0.5	0.5	0.7	0.5	0.7	0.8	0.5	0.5	0.7	0.7	0 9	0.7	540.0	0.7	0 6	0.9	0 8	1.1	0 8	0.8	0.7	0.5	0.8	0.6
Total Sod um (Na)	mg/L	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	6 6	11.5	16.1	17.7	13.8	15.4	13.0	9.2	13.9	11.8
React ve S l ca (S O2)	mg/L	0 5	--	--	--		2.2	2.2	2.2	2.2	4.2	4.7	2.7	4.3	4.0	2.6	4.0	4.9	2.8	4.4	4.9	2.4	3 3	4.6	2 0	3.7	5 1	2.0	2 3	4.5	1 3	2.2	4.6	2.3	2.8	3.6
Total Suspended Sol ds	mg/L	5	--	--	Comment 1		103	103	103	103	7	1	1	2	1	5	5	5	5	135	5	5	5	5	1.0	5	17	5	5	5	12	5	5	5	5	5
D ssolved Sulphate (SO4)	mg/L	2	--	--	--		9	9	9	9	2	2	2	2	2	3	3	2	4	5	4	4	2	3	3	2	3	4	3	7	3	2	3	3	2	3.0
Tu b d ty (NTU)	NTU	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	6 2	0.7	2 0	1.9	0 8	4.4	1.6	0.9	1.2	1.1
Conduct v ty (uS/cm)	µS/cm	1	--	--	--		212	212	212	212	100	97	79	66	54	71	91	61	83	69	62	87	94	66	64	81	73	79	135	125	93	110	97	68	115	70.0
Calculated Parameters																																			
An on Sum	me/L	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	0.40	0.56	1.00	1.13	0.73	0.82	0.78	0.41	0 76	0.4
B ca b. Alkal n ty (calc. as CaCO3)	mg/L	5	--	--	--		1	8	1	5	7	1	1	7	1	20	5	8	5	5	5	29	7	28	1.0	7	5	5	10	6	5	12	9	5	11	5
Calculated TDS	mg/L	1	--	--	--		36	55	35	46	55	38	37	34	25	45	44	34	37	37	31	65	44	44	32	36	25	38	59	68	46	51	47	28	47	31.0
Ca b. Alkal n ty (calc. as CaCO3)	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	10	10	10	10	10	10	10	10	10
Cat on Sum	me/L	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	0.47	0.76	1.09	1.25	0.91	1.05	0.90	0.62	0.97	0.8
Ha dness (CaCO3)	mg/L	N/A	--	--	--		10.00	15.00	10.00	12.00	14.00	12.00	9.00	9.00	8.00	8.90	13.10	11.40	9 60	8.30	9 30	13.00	14 10	8.50	9 10	12.20	5.60	10.10	15 80	20.20	13 10	15.70	13.40	8.6	15	10.5
Ion Balance (% D ffe ence)	%	N/A	--	--	--		18.30	9.39	19.60	1.99	5.56	20.30	12.40	1.85	27.30	17.60	19.70	15.10	0 30	12.90	11.00	7.10	19 10	25.70	8.57	20.50	7.50	14.90	4.50	5.30	11 00	12.30	7.50	20 8	12.4	16.7
Langel e Index (@ 20C)	N/A	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	-4.51	-4.04	-3.04	-3.85	-3.73	-2.98	-3.35	-4 02	-2.85	-4 1
Langel e Index (@ 4C)	N/A	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	-4.83	-4.36	-3.36	-4.17	-4.05	-3.30	-3.67	-4 34	-3.17	4 4
Satu at on pH (@ 20C)	N/A	N/A	--	--	--		NC	9.78	NC	10.00	9.83	NC	NC	10.10	NC	9.87	10.30	10.20	10.40	10.50	10.50	9.57	10 10	9.72	NC	10.20	10 80	10.40	9.91	10.00	10 30	9.85	10.00	10 5	9 89	10.4
Satu at on pH (@ 4C)	N/A	N/A	--	--	--		NC	10.00	NC	10.30	10.10	NC	NC	10.30	NC	10.20	10.60	10.50	10.70	10.80	10.80	9.89	10 40	10.00	NC	10.50	11 10	10.70	10 20	10.40	10 60	10.20	10.30	10 8	10.2	10.7
Metals (ICP-MS)																																			
Total Alum num (Al)	µg/L	5	5	--	5 - 100		290	--	--	175	151	--	271	--	--	209	205	338	256	270	259	205	236	340	180	--	284	197	--	--	185	150	240	228	123	--
Total Ant mony (Sb)	µg/L	2	20	--	--		2	--	--	1 0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total A sen c (As)	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	2	--	--	2	--	2	2	2	--
Total Ba um (Ba)	µg/L	5	1000	--	--		9	--	--	12	14	--	10	--	--	9	11	10	8	5	13	13	18	9	9	--	9	10	--	--	10	--	14	7	14	--
Total Be yll um (Be)	µg/L	2	5.3	--	--		2	--	--	1 0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total B smuth (B)	µg/L	2	--	--	--		2	--	--	2 0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Bo on (B)	µg/L	5	1200	--	1500		8	--	--	15	13	--	50	--	--	6	14	22	6	11	9	11	12	12	50	--	5	9	--	--	6	--	17	7	13	--
Total Cadm um (Cd)	µg/L	0.017	0.01	--	0 09		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	--	0.176	0.017	--	--	0.041	--	0.017	0.09	0.09	--
Total Ch om um (C)	µg/L	1	--	--	--		2	--	--	1 0	1.0	--	1.0	--	--	1	1	1	1	1	1	9	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total Cobalt (Co)	µg/L	1	10	--	--		1	--	--	0.40	0.40	--	0.40	--	--	1	1	1	1	1	1	1	1	1	0.40	--	1	1	--	--	1	--	1	1	1	--
Total Copper (Cu)	µg/L	1	2	--	2		2	--	--	2 0	2.0	2 0	2.0	2.0	2.0	2	2	2	2	1	2	1	1	2	2.0	1	1	1	2	--	1	1	1	1	1	1.0
Total I on Fe)	µg/L	50	300	--	300		250	--	--	227	403	238	202	418	358	154	541	813	269	528	523	174	723	905	250	641	478	232	1,000	290	168	759	572	148	783	336 0
Total Lead (Pb)	µg/L	0 5	1	--	1.0 - 7.0		0.5	--	--	1.0	0.50	--	0.50	--	--	0.5	0.5	1.1	0.5	0.5	0.5	5.8	0.5	0.5	0.5	--	0 6	0.5	--	--	0.5	--	0.5	1.2	0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		26	--	--	43	83	35	12	68	23	17	90	114	24	67	53	33	146	25	47	120	57	21	109	39	39	96	64	17	78	29.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		2	--	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total N ckel (N)	µg/L	2	25	--	25 - 150		2	--	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Selen um (Se)	µg/L	1	1.0	--	1		2	--	--	1	1	--	1	--	--	1	1	1	1	1	1	1	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total S lve (Ag)	µg/L	0 1	0.1	--	0 25		0.5	--	--	0.4	0.4	--	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	--	--	0.1	--	0.1	0 1	0.1	--
Total St ont um (S)	µg/L	5	21000	--	--		14	--	--	18	20	--	12	--	--	10	18	15	12	9	12	16	17	12	12	--	8	12	--	--	15	--	20	10	24	--
Total Thall um (Tl)	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	0.1	0.1	0.1	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0.1	0 1	0.1	--
Total T n (Sn)	µg/L	2	--	--	--		2	--	--	2	2	--	2	--	--	2	2	3	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total T tan um (T)	µg/L	2	--	--	--		2	--	--	2	2	--	3	--	--	2	2	4	2	2	2	2	2	3	3	--	2	2	--	--	2	--	2	2	2	--
Total U an um (U)	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	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0.1	0 1	0.1	--
Total Vanad um (V)	µg/L	2	6	--	--		2	--	--	2 0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Z nc (Zn)	µg/L	5	30	--	30		8	--	--	5	5	7	5.0	5.0	5.0	5	5	7	5	5	5	5	5	5	5.0	5	5	5	5	8	5	8	6	5	5	20.0
MICROBIOLOGICAL																																			
Total Col fo m	MPN/100mL	1	--	--	--		1 800	170	--	>250	11	>250	59	>250	--	>2420	1,986	>2420	>2420	>2420	>2420	525	>2420	>2420	----	>2420	>2420	>2420	>2420	>2420	>2420	>2420	659	10	2420	140 0
E. col	MPN/100mL	1	--	400	--		1 500	100	--	>250	6	6	2	>250	100	1	7	1	12	6	2	1	18	11	30	11	5	4	15	25	31	16	3	4	20	50.0
Chlo ophyll A - Ac d f cat on method	µg/L	0.05	--	--	--		0.82	6.05	1.97	0.73	0.55	0.22	0.44	0.89	0 97	0.53	2 20	0.07	0 62	1.00	0 73	0.13	0.83	0.41	0.34	0.96	0.46	0.30	1.86	0.32	0.99	1.47	0.31	0.51	1.25	0.7
Chlo ophyll A - Welschmeye method	µg/L	0.05	--	--	--		0.87	5.97	1.95	0.66	0.54	0.21	0.42	0.73	0 82	0.56	2 20	0.12	0 72	1.00	0 74	0.14	0.86	0.41	---	1.26	0.26	0.43	2.43	0.36	1.86	1.81	0.49	0.91	--	*

Notes

N/A - Not Appl cable NC - Not Calculable NCC Not Collected
RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)
-- ' = no gu del ne ava lable / Not Tested.
CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)
CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.
**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.
Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009) (Refe enced)
Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

Bold and black shaded = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Unde l ned (black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Hea th Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2 H storical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreat onal Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Tr gger Range (Applied)	Kearney Lake																								
Sample S tes							KL3																								
Sampl ng Date	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	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Sampl ng T me	hh mm	--					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	10 40	11 00	11 30	11 00	9 36	10 15	10 15	10 30	9 10	11 30 AM
FIELD DATA																																			
Secch Depth	Mete s	--	--	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wate Temp	Cels us	--	--	--	--		14 0	21.6	17 3	14.7	23.1	9 9	10 3	21 1	15 5	9 0	24 5	15 6	11 7	21 5	13.6	11 0	22.7	12 8	14 7	25 0	8 4	12 1	21 7	12 5	16 1	22 5	13 8	12 1	23 8	12 4
D ssolved Oxygen	mg/L	--	--	--	5.5 - 9 5		10 8	8 0	8.0	9 3	7 8	10 4	11 1	8 4	9 6	8 9	8 2	7 7	10 2	9 2	8 9	5 9	7 9	8 1	8 0	9 9	8 7	9 3	7 7	11 4	9 0	7 4	8 2	7 3	6 9	8 6
pH (n S tu)	pH	--	--	5.0-9.0	6.5 - 9 0		7 3	6 7	7 0	7 3	7 3	6 8	6 8	7 0	6 3	7 7	6 9	6 5	5 9	7 3	6 5	6 6	7 4	6 7	6 8	6 9	7 2	7 4	6 8	8 6	7 0	7 0	7 0	6 7	6 9	6 6
Spec f c Conductance	uS/cm	--	--	--	--		95 0	282.0	246.0	220.0	228.0	199 4	220.0	175.0	161.3	204.0	225.0	177.2	207.3	194 4	210.6	405 0	252.0	208 0	0 2	245 1	236.6	213.0	264.0	227 8	204.0	248.0	248.0	190.3	242.7	209 8
INORGANICS																																			
Total Alkal n ty (as CaCO3)	mg/L	5	--	--	--		5	7	7	6	7	7	6	7	7	23	6	5	5	5	7	15	5	6	5.0	6	6	5	9	8	5	8	9	5	8	7.0
D ssolved Chlo de (Cl)	mg/L	1	--	--	120		66	63	60	55	55	53	56	43	37	50	57	46	54	40	46	58	46	45	60	56	56	54	56	49	63	56	59	54	48	46.0
Colou	TCU	5	--	--	--		22	20	20	28	12	20	31	38	40	57	15	31	19	23	20	16	13	20	34	13	14	29	13	21	24	13	15	63	26	27.0
N t te N t ate	mg/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	0.09	0.21	0.11	0.05	0.17	0 13	0.13	0 16	0.12	0 21	0.14	0.13	0.10	0.24	0.30	0.24	0.17	0 06	0.1
N t ate (N)	mg/L	0 05	--	--	13		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	0 21	0.14	0.06	0.10	0.13	0.17	0.24	0.17	0 06	0.1
N t te (N)	mg/L	0 05	--	--	0.06		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	0.05	0.07	0.05	0.11	0.13	0.05	0.05	0.05	0.05
N t ogen (Ammon a N t ogen) *	mg/L	0 03	--	--	18		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	0.03	0.06	0 03	0.03	0 03	0.03	0.03	0.03	0 04	0.03
Total Kjeldahl N t ogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.4	2.8	0.4	--	1.3	0.4	0.6	0.4	0.4	0.2	1.2	0.9	0.4	0.4	0.4	0.4	0.8	0.4	0.4	0.4	0.4
Total O gan c Ca bon	mg/L	0.5	--	--	--		2.6	3 9	4.3	3 6	3.1	3.3	3.8	5.1	5.0	5.9	3.4	4.9	4.3	4.4	4.6	4.6	2.8	4.5	3.4	5.7	5.8	4.3	2 7	8.0	5 3	4.9	4.1	5.1	3.2	4.0
O thophosphate (as 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 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	0 01	0 01	0.01	0.01	0.01	0 01
pH (Lab)	pH	N/A	--	5.0-9.0	6.5 - 9 0		6.4	6.7	6.8	6.8	7.0	6.9	6.5	6.5	6.4	6.7	7.1	6.9	6.7	7.0	6.9	6.7	7.0	6.9	6.7	7.3	6.9	6.8	7.1	6.9	6.8	7.1	6.9	6.72	7.21	7.1
Total Calc um (Ca)	mg/L	0.1	--	--	--		6.7	7 1	6.8	6.8	8.0	8.3	7 1	4.7	5.6	5.7	6.9	6.0	7.0	5.3	6.8	6.4	7.9	6.8	6 600 0	7.8	5.2	6.2	8 3	7.3	6 9	7.2	8.1	6.0	7.3	8.4
Total Magnes um (Mg)	mg/L	0.1	--	--	--		1.2	1 2	1.1	1 2	1.3	1.3	1 2	0.8	1.0	1.0	1 2	1.3	1.0	0.9	1.3	1.4	1 2	1.0	940.0	1.2	0.9	1.0	1 3	1.3	1 0	1.1	1.2	1.0	1.2	1.4
Total Phospho us	mg/L	0.002	--	--	--	0 010	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	0 148	0.004	0.004	0.002	0 008	0.005	0.004	0.006	0.009	0.007	0.010	0.010	0 006
Total Potass um (K)	mg/L	0.1	--	--	--		0.9	1 1	0 9	0 8	0.8	1.0	0 9	0.7	0 9	0.7	0 9	0 9	0 8	0.6	1 2	0 8	1.1	0 9	770.0	0 9	0.7	0 7	0.7	1 0	1.0	0 8	0 9	1 0	0.7	1.0	1.1
Total Sod um (Na)	mg/L	0.1	--	--	--		38.0	38.0	35.0	28.3	33.1	33.0	33.0	20 8	21.3	31 2	34.5	26.4	35.1	20.1	32.1	36.4	39.0	35.3	34.0	40.0	27.1	32.1	37.2	32.8	44.0	41.4	35.9	35 9	36.6	39.9
React ve S l ca (S O2)	mg/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	2.6	2.6	1 8	2.5	2 2	1.6	1.9	2.6	1.7	1.9
Total Suspended Sol ds	mg/L	5	--	--	Comment 1		1	1	1	2	2	1	1	1	1	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	5
D ssolved Sulphate (SO4)	mg/L	2	--	--	--		11	12	12	10	10	10	9	10	8	7	8	7	7	7	8	9	7	7	8	9	8	10	10	10	10	9	10	8	7.0	7.0
Tu b d ty (NTU)	NTU	0.1	--	50	--		0.7	1 4	0.6	0 3	0.5	0.6	0.6	0.4	0.8	0.7	1.0	0.7	2.4	0.4	0.4	0.3	0.9	0.7	0 5	0.7	0.7	1 1	1 1	1.0	1 0	1 3	2.6	1.0	0.5	1.2
Conduct v ty (uS/cm)	µS/cm	1	--	--	--		250	250	240	220	220	220	220	170	160	197	222	182	219	216	204	218	243	216	220	242	238	206	262	185	245	251	247	244	246	232 0
Calculated Parameters																																			
An on Sum	me/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	1.88	1.74	1.98	1.76	2.00	1.95	2.07	1.70	1 66	1.6
B ca b. Alkal n ty (calc. as CaCO3)	mg/L	5	--	--	--		1	7	7	6	7	7	6	7	7	23	6	5	5	5	7	15	5	6	1.0	6	6	5	9	8	5	8	9	5	8	5
Calculated TDS	mg/L	1	--	--	--		128	130	123	110	117	116	115	88	82	111	113	91	106	78	100	122	106	100	110	119	103	105	120	107	127	122	122	107	106	109 0
Ca b. Alkal n ty (calc. as CaCO3)	mg/L	10	--	--	--		1	1	1	1	1	1	1	1	1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Cat on Sum	me/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	1 55	1.83	2.18	1.94	2.38	2.28	2.10	1.98	2 09	2.3
Ha dness (CaCO3)	mg/L	N/A	--	--	--		22.00	23 00	22.00	22 00	25.00	26.00	23.00	15.00	18.00	18.40	22.20	20.30	21.60	16.90	22.30	21.70	24.70	21 10	20.00	24.40	16.70	19.60	26 10	23.60	21 30	22.50	25.20	19 1	23.2	26.7
Ion Balance (% D ffe ence)	%	N/A	--	--	--		0.24	0.23	2.21	5.85	1.03	2.86	0.52	12.50	1.49	6.80	2.10	1.60	8.60	5.50	8 30	1.50	17.90	12.80	0.53	9.00	9 80	2.60	4.80	4.90	8.60	7.90	0.80	7.6	11.4	18.4
Langel er Index (@ 20C)	N/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	-3.15	-3.41	-2.44	-2.89	-3.29	-2.71	-2.85	-3 39	-2.61	-2 7
Langel er Index (@ 4C)	N/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	-3.47	-3.73	-2.76	-3.21	-3.61	-3.03	-3.17	-3 71	-2.93	-3 0
Satu at on pH (@ 20C)	N/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	10.00	10.20	9 91	9.61	9 99	9.98	NC	9.92	10.10	10.10	9.72	9.82	10 10	9.84	9.73	10 1	9 82	9.8
Satu at on pH (@ 4C)	N/A	N/A	--	--	--		NC	9.92	9.96	9.99	9.84	9.86	10.00	10.10	9.98	9.79	10.30	10.40	10.40	10.50	10.20	9.93	10.30	10.30	NC	10 20	10.40	10.40	10 00	10.10	10 40	10.20	10.10	10 4	10.1	10.1
Metals (ICP-MS)																																			
Total Alum num (A)	µg/L	5	5	--	5 - 100		259	259	--	124	54	--	266	--	--	199	54	153	140	65	100	260	52	105	180	--	90	163	--	--	128	36	43	164	26	--
Total Ant mony (Sb)	µg/L	2	20	--	--		2	2	--	1 0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total A sen c (As)	µg/L	2	5.0	--	5		2	2	--	1.0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total Ba um (Ba)	µg/L	5	1000	--	--		13	13	--	16	13	--	19	--	--	18	17	15	19	9	18	17	17	16	19	--	19	15	--	--	17	--	20	14	15	--
Total Be yllum (Be)	µg/L	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	2	2	--
Total B smuth (B)	µg/L	2	--	--	--		2	2	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Bo on (B)	µg/L	5	1200	--	1500		9	9	--	8	9	--	50	--	--	5	9	17	9	7	10	8	10	12	50	--	5	8	--	--	7	--	12	5	10	--
Total Cadm um (Cd)	µg/L	0.017	0.01	--	0.09		0.019	0.019	--	0.028	0.017	--	0.046	--	--	0.015	0.021	0.022	0.028	0.017	0.017	0.038	0.017	0.017	0.033	--	0 017	0.021	--	--	0.020	--	0.017	0.09	0.09	--
Total Ch om um (C)	µg/L	1	--	--	1		1	1	--	1.0	1.0	--	1.0	--	--	1	1	1	1	1	1	7	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total Cobalt Co)	µg/L	1	10	--	--		1	1	--	0 40	0.40	--	0.40	--	--	1	1	1	1	1	1	1	1	1	0.40	--	1	1	--	--	1	--	1	1	1	--
Total Coppe (Cu)	µg/L	1	2	--	2		2	2	--	2.0	2.0	2 0	2.0	2 0	2.0	2	2	2	2	2	2	1	1	1	2.0	1	1	2	1	1	1	1	1	1	1	1.0
Total I on (Fe)	µg/L	50	300	--	300		523	523	--	73	133	58	136	104	154	137	136	119	131	71	172	137	96	118	120	165	115	112	117	99	125	83	130	81	148	50
Total Lead (Pb)	µg/L	0.5	1	--	1.0 - 7 0		0.5	0.5	--	0 6	0.5	--	0.5	--	--	0 5	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	--	0.5	0.5	--	--	0.5	--	0.5	0.7	0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		53	53	--	37	67	32	42	33	33	25	47	46	37	20	92	41	45	27	36	48	24	31	41	20	30	35	54	21	50	22.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		2	2	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total N ckel (N)	µg/L	2	25	--	25 - 150		2	2	--	2	2.0	--	2	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Selen um (Se)	µg/L	1	1.0	--	1		1	1	--	1.0	1.0	--	1.0	--	--	1	1	1	1	1	1	1	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total S lve (Ag)	µg/L	0.1	0.1	--	0.25		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	--	0.1	0.1	--	--	0.1	--	0.1	0 1	0.1	--
Total St ont um (S)	µg/L	5	21000	--	--		12	12	--	34	36	--	33	--	--	25	33	29	33	18	32	31	32	29	29	--	21	28	--	--	33	--	41	27	38	--
Total Thall um (Tl)	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	0.1	0.1	0.1	0.1	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0.1	0 1	0.1	--
Total T n (Sn)	µg/L	2	--	--	--		2	2	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total T tan um (T)	µg/L	2	--	--	--		2	2	--	2.0	2.0	--	5	--	--	2	2	2	2	2	2	3	2	2	3	--	2	2	--	--	2	--	2	2	2	--
Total U an um (U)	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	0.1	0.1	0.1	--	0.1	0.1	--	--	0.1	--	0.1	0 1	0.1	--
Total Vanad um (V)	µg/L	2	6	--	--		2	2	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2	--	2	2	--	--	2	--	2	2	2	--
Total Z nc (Zn)	µg/L	5	30	--	30		5	5	--	10	7	6	9	7	9	5	5	8	10	5	7	10	5	6	9	7	8	8	5	5	6	6	6	6	5	5
MICROBIOLOGICAL																																			
Total Col fo m	MPN/100mL	1	--	--	--		120	24	--	190	16	58	72	110	--	291	1 553	178	345	2,420	1,300	86	1,730	>2420	---	2,420	285	548	1,990	2,420	687	2,420	411	1	NDOGT	5 020 0
E. col	MPN/100mL	1	--	400	--		1	17	--	2	1	8	5	37	100	2	1	3	8	21	1	1	1	13	0.10	7	6	2	38	30	7	13	46	1	51	20.0
Chlo ophy l A - Ac d f cat on method	µg/L	0 05	--	--	--		1.04	1.11	1.18	1.30	1.14	0.51	0.78	1.26	1.24	0.52	1.30	0.81	1.44	2.00	0 65	0.76	0 59	1.23	0 72	1.27	1 34	1 63	0.81	2.29	1 96	1.24	1.34	1.16	1 14	1.1
Chlo ophy l A - Welschmeye method	µg/L	0 05	--	--	--		0.94	0.97	1.21	1.09	1.19	0.42	0.67	0.98	1.01	0.55	1.20	1.14	1.62	2.30	0 61	0.69	0 51	1.12	0 68	1.34	0 69	2.00	0.99	2.37	2.46	1.32	1.87	1.8	--	*

Notes

N/A - Not Appl cable NC - Not Calculable NCC Not Collected
RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)
-- " = no gu del ne ava lable / Not Tested.
CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)
CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.
**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.
Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009) Refe enced)
Nova Scot a Env onment Env onmental Qual ty Standa ds fo Su face Wate (Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway

Bold (black shaded) = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Bold & Underlined (black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2 Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guidel ne for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Kearney Lake																								
Sample S tes							KL4																								
Sampl ng Date	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	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Sampl ng T me	hh mm	--					10 00	11 30	10 00	11 20	13 50	11 15	10 10	11 40	11 40	12 00	11 40	11 40	9 41	10 30	14 20	11 15	11 35	14 35	10 25	11 02	11 15	11 30	12 00	11 11	9 25	10 45 AM	10 05 AM	10 45 AM	9 00 AM	11 45 AM
FIELD DATA																																			
Secch Depth	Metr s	--	--	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wate Temp	Cels us	--	--	--	--		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	14.8	24.7	9.5	12.2	20.6	12.3	16.5	22.4	13.8	12.7	23.1	12.7
D ssolved Oxygen	mg/L	--	--		5.5 - 9.5		10.9	8.1	8.3	9.0	6.3	10.9	11.0	8.6	9.7	8.7	7.3	8 9	10.1	8.9	9.6	14.5	5.9	7.5	9.8	9 1	8.8	8.3	5 5	10.1	8 3	6.4	7.3	11.0	4.7	8.5
pH (n S tu)	pH	--	--	5.0-9.0	6.5 - 9.0		8.0	6.7	6.9	7.2	7.0	6.1	6.5	6.4	6.0	9.0	6.7	6 8	5 7	7 1	6.4	6 3	7.3	6.6	6.6	6 8	7.1	7.3	6 7	6 1	6 9	6 9	6 8	7.0	6.7	6 9
Spec f c Conductance	uS/cm	--	--		--		771.0	262.0	247.0	224.0	226 0	214.8	218.0	171.9	126.2	206 0	225 0	185.9	207.1	196.2	209.0	273.0	251.0	208.0	0.2	243.5	232.4	215.0	260.0	228.0	213.0	262.0	252.0	202 9	251.0	210 6
NORGANICS																																			
Total Alkal n ty (as CaCO3)	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	5	9	8	5	9	10	5	9	8.0
D ssolved Chlo de (Cl)	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	54	58	49	64	62	59	52	50	47.0
Colou	TCU	5	--	--	--		22	18	20	27	11	20	32	38	43	48	11	20	17	21	20	13	11	28	33	10	12	25	12	22	19	11	16	35	10	16.0
N t te N t ate	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	0.15	0.21	0.10	0.27	0.12	0.15	0.27	0.25	0.1 0.1
N t ate (N)	mg/L	0.05	--	--	13		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	0.15	0.14	0.10	0.15	0.12	0.15	0.17	0 13	0.1
N t te (N)	mg/L	0.05	--	--	0 06		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	0.05	0.07	0.05	0.12	0.05	0.05	0.10	0 12	0.05
N t ogen (Ammon a N t ogen) *	mg/L	0.03	--	--	18		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 10	0 03	0.04	0.06	0 03	0.03	0 03	0.03	0.04	0.03	0.04	0.03
Total Kjeldahl N t ogen as N	mg/L	0 4	--	--	--		--	--	--	--	--	--	--	--	--	0.5	0.4	0 7	--	1.8	1.1	0.4	0.4	0 4	0.2	0 4	1.0	0.4	0.4	0 4	0.5	0.4	0.4	0.4	0.4
Total O gan c Ca bon	mg/L	0 5	--	--	--		2.5	2.6	4.0	3.3	2.6	3.1	3.7	6.0	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	4.3	3 3	8.1	5 1	4.3	4.0	5.1	2.7	4.0
O thophosphate (as 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	0.01	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	0 01	0.01	0.01	0.01	0.01	0.01
pH (Lab)	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.6	6.8	6.8	6.8	6.9	6.8	6.6	6.6	6.5	6.7	7.0	6 9	6 7	7.0	6.9	6 7	6.9	6.9	6 6	6 9	7.0	6.7	7 0	6 9	6 8	7.0	7.0	6.7 4	7 1 3	7.1
Total Calc um Ca)	mg/L	0 1	--	--	--		6.8	7.7	7.0	6.8	6.8	8.0	8.5	6.8	4.9	5.2	5.7	6.8	5 8	6.8	5.1	6.8	6 4	7 9	6.8	6,500.0	7 9	3.7	6.5	5 1	7 3	7 7	7.5	8.6	5.9	7.9	7.7
Total Magnes um (Mg)	mg/L	0 1	--	--	--		1.2	1.3	1.2	1.2	1.2	1.3	1.2	0.9	1.0	1.0	1.2	1.0	0.8	1.2	1.3	1.2	1.0	920.0	1.3	1.0	1.0	1.1	1.3	1.2	1.1	1.3	1.0	1.2	1.3	1.3
Total Phospho us	mg/L	0.002	--	--	--	0 010	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	2.390	0.016	0.023	0.051	0 015	0.006	0.007	0.003	0.007	0.004	0.007	0.020	0.008	0.006	0.024	0.004	0.004
Total Potass um (K)	mg/L	0 1	--	--	--		0.9	1.0	1.0	0.8	0.9	1.0	0.8	0.7	1.1	0.7	1.0	0 9	0 8	0.6	1.2	0 8	1.1	0.9	760.0	0 9	0.7	0.7	0 9	1.0	0 8	0.9	1.1	0.7	1.0	1.0
Total Sod um (Na)	mg/L	0 1	--	--	--		39.0	41.0	37.0	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	34.0	40.0	28 2	32.4	41.4	31.1	37.6	41.4	38.9	35.6	39.2	40.6
React ve S l ca (S O2)	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	2.6	2 0	2.4	2 3	1.7	2.1	2.6	1.8	2.0
Total Suspended Sol ds	mg/L	5	--	--	Comment 1		1	1	1	2	2	1	2	1	2	5	5	5	5	5	5	5	5	5	5	5	5	7	5	10	6	5	5	5	5	5
D ssolved Sulphate (SO4)	mg/L	2	--	--	--		11	12	11	10	10	10	9	10	8	7	8	7	7	7	9	9	8	8	8	9	8	10	10	10	10	9	10	8	7.0	8.0
Tu b d ty (NTU)	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	0.6	0 7	1.2	1.2	1 5	1.6	1 3	0.9	1.6	1.2	0.5	1.7
Conduct v ty (uS/cm)	µS/cm	1	--	--	--		260	250	230	220	230	250	210	170	160	200	224	183	218	218	204	219	241	218	220	241	235	206	275	185	251	255	248	243	252	231 0
Calculated Parameters																																			
An on Sum	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	1.74	2.04	1.76	2.03	2.12	2.08	1.65	1.75	1.7
B ca b. Alkal n ty (calc. as CaCO3)	mg/L	5	--	--	--		5	7	7	6	8	7	5	8	7	22	8	5	5	5	5	30	5	29	1.0	6	7	5	9	8	5	9	10	5	9	8.0
Calculated TDS	mg/L	1	--	--	--		132	135	125	111	118	116	113	90	81	111	114	87	103	75	97	132	108	117	110	121	102	106	125	105	123	128	105	113	111	111 0
Ca b. Alkal n ty (calc. as CaCO3)	mg/L	10	--	--	--		1	1	1	1	1	1	1	1	1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Cat on Sum	me/L	N/A	--	--	--		2.16	2.32	2.07	1.70	2.02	2.03	1.86	1.28	1.30	1.78	1.97	1.53	1.84	1 23	1.84	2.04	2.21	1.94	1.91	2.35	1.53	1.86	2.28	1.87	2.17	2.31	2.27	1.96	2.24	2.3
Ha dness (CaCO3)	mg/L	N/A	--	--	--		22.00	25.00	22.00	22.00	25.00	27.00	22.00	16.00	17.00	18.40	21.90	19 40	21 10	16.00	21.90	21 30	24.70	21.10	20.00	25 10	13.40	20.30	22 30	23.60	24 20	23.30	26.80	18.9	24.7	24.6
Ion Balance (% D ffe ence)	%	N/A	--	--	--		1.59	2.20	0.48	5.82	2.02	4.64	0.53	11.70	2.26	6.60	0.80	2.80	4.50	3 20	9.20	9.50	15.80	4.20	0.79	10.70	10.10	3.40	5.50	3.00	3.20	4.10	4.30	8.6	12.1	16.2
Langel e Index (@ 20C)	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	-2.63	-3.08	-2.45	NC	-2.98	-3.20	-3.38	-2.76	-2.93	-3.26	-2.78	-2.71	-3.38	-2.61	-2.7	-2.7
Langel e Index (@ 4C)	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	-3.70	-3.08	-3.25	-3.58	-3.10	-3.03	-3 70	-2.93	-3.0
Satu at on pH (@ 20C)	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 10	10.20	10.10	9.32	9.99	9.30	NC	9.92	10.20	10.10	9.79	9.82	10.00	9.77	9.66	10.1	9 74	9.8
Satu at on pH (@ 4C)	N/A	N/A	--	--	--		10.10	9.89	9.92	10.00	9.82	9.83	10.00	10.00	10.00	9.81	10.20	10 40	10 40	10.50	10.40	9.64	10.30	9.62	NC	10.20	10.50	10.40	10 10	10.30	10 10	10.30	10.10	9.98	10.4	10.1	10.1
Metals (ICP-MS)																																			
Total Alum num (A)	µg/L	5	5	--	5 - 100		150	--	--	125	29	--	231	--	--	188	48	149	141	106	159	236	46	93	160	--	84	172	--	--	180	89	55	157	33	--
Total Ant mony (Sb)	µg/L	2	20	--	--		2	--	--	1.0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total A sen c (As)	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	2	--	--	2	--	2	2	2	--
Total Ba um (Ba)	µg/L	5	1000	--	--		16	--	--	17	18	--	18	--	--	18	17	16	18	10	19	17	19	16	20	--	17	16	--	--	20	--	20	15	19	--
Total Be yl um (Be)	µg/L	2	5.3	--	--		2	--	--	1.0	1.0	--	1.0	--	--	2	2	2	2	2	2	2	2	2	1.0	--	2	2	--	--	2	--	2	2	2	--
Total B smuth (B)	µg/L	2	--	--	--		2	--	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total Bo on (B)	µg/L	5	1200	--	1500		6	--	--	9	9	--	50	--	--	6	9	16	7	6	9	8	11	11	50	--	5	7	--	--	11	6	10	10	--	--
Total Cadm um (Cd)	µg/L	0.017	0.01		0.09		0.3	--	--	0.031	0.017	--	0.035	--	--	0.021	0.017	0.027	0.022	0.017	0.058	0.052	0.017	0.017	0.018	--	0.017	0.016	--	--	0.021	--	0.017	0.09	0.09	--
Total Ch om um (C)	µg/L	1	--	--	1		2	--	--	1.0	1.0	--	1.0	--	--	1	1	6	1	1	1	6	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total Cobalt (Co)	µg/L	1	10	--	--		1	--	--	0.40	0.40	--	0.40	--	--	1	1	1	1	1	1	1	1	1	0.4	--	1	1	--	--	1	--	1	1	1	--
Total Copp (Cu)	µg/L	1	2	--	2		2	--	--	2.0	2	2.0	2	2.0	2.0	2	2	4	3	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1.0
Total Iron (Fe)	µg/L	50	300	--	300		86	--	--	82	51	55	119	109	138	129	118	133	213	144	248	129	55	104	100	217	83	122	61	114	136	131	141	83	119	78.0
Total Lead (Pb)	µg/L	0 5	1	--	1.0 - 7.0		0.5	--	--	3.2	0.5	--	--	0.5	0.5	0 8	0 9	0.5	0.5	0.5	2 6	0.5	0.5	0.5	0.5	--	0 5	0.5	--	--	0.5	--	0.5	1.4	0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		51	--	--	35	64	29	39	27	30	23	34	38	34	77	130	34	29	24	25	78	34	34	58	29	74	76	48	19	84	43.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		2	--	--	2.0	2.0	--	2.0	--	--	2	2	2	2	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total N ckel (N)	µg/L	2	25	--	25 - 150		3	--	--	2	2.0	--	2.0	--	--	2	2	5	2	2	2	2	2	2	2.0	--	2	2	--	--	7	--	2	2	2	--
Total Selen um (Se)	µg/L	1	1.0	--	1		2	--	--	1.0	1.0	--	1.0	--	--	1	1	1	1	1	1	1	1	1	1.0	--	1	1	--	--	1	--	1	1	1	--
Total S lve (Ag)	µg/L	0 1	0.1	--	0 25		0.5	--	--	0.1	0.1	--	0.1	--	--	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	--	0 1	0.1	--	--	0.1	--	0.1	0.1	0.1	--
Total St ont um S)	µg/L	5	21000	--	--		34	--	--	33	37	--	33	--	--	25	32	28	32	17	31	31	31	29	30	--	20	28	--	--	33	--	40	27	39	--
Total Thall um (Tl)	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	0.1	0.1	0.1	0.1	0.1	--	0 1	0.1	--	--	0.1	--	0.1	0.1	0.1	--
Total T n (Sn)	µg/L	2	--	--	--		2	--	--	2	2	--	2	--	--	2	2	2	5	2	2	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total T tan um (T)	µg/L	2	--	--	--		2	--	--	2	2	--	4	--	--	2	2	2	2	2	3	2	2	2	2.0	--	2	2	--	--	2	--	2	2	2	--
Total U an um (U)	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	0.1	0.1	--	0 1	0.1	--	--	0.1	--	0.1	0.1	0.1	--
Total Vanad um (V)	µg/L	2	6	--	--		2	--	--	2	2	--	2	--	--	2	2	2	2	2	2	2	2	2	2	--	2	2	--	--	2	--	2	2	2	--
Total Z nc (Zn)	µg/L	5	30	--	30		14	--	--	10	7	7	11	7	7	5	5	68	21	5	9	9	5	5	10	8	12	7	5	5	13	7	5	7	5	7.0
MICROBIOLOGICAL																																			
Total Col fo m	MPN/100mL	1	--	--	--		28	58	--	100	16	75	83	95	--	345	>2420	921	548	>2420	770	308	1,550	>2420	---	>2420	281	488	1,730	>2420	792	>2420	>2420	4	NDOGT	8 000 0
E. col	MPN/100mL	1	--	400	--		4	33	--	1	1	2	5	39	100	4	1	4	6	38	1	1	1	8	10	5	1	2	35	29	15	1	3	2	19	12.0
Chlo ophyll A - Ac d f cat on method	µg/L	0.05	--	--	--		0.78	1.11	1.06	0.92	0.07	0.50	0.60	1.04	1.31	0.52	0.70	0.55	1.34	1 50	0.40	0.44	0.50	1.03	0 55	0.26	1.09	1 62	0.16	2.18	2.40	0.33	0.35	1.06	0.24	1.1
Chlo ophyll A - Welschmeye method	µg/L	0.05	--	--	--		0.69	0.96	1.11	0.77	0.07	0.41	0.55	0.82	1.07	0.55	0.70	0.74	1.48	1 70	0.39	0.40	0.57	0.95	0 51	0.31	0.55	2.09	0.21	2.15	3.04	0.39	0.43	1.71	--	*

Notes

N/A - Not Appl cable NC - Not Calculable NCC Not Collected
RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)
-- ' = no gu del ne ava lable / Not Tested.
CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)
CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.
**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.
Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009) (Refe enced)
Nova Scot a Env onment Env onmental Qual ty Standa ds fo Su face Wate (Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence

Bold (black shaded) = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Underlined (black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2 Historical Data - Bedford West Water Qual ty Sampl ng Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Appl ed)	HRM Phosphorus Trigger Range (Applied)	Kearney Lake																		
Sample S tes							KLS																		
Sampl ng Date	vvvv-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	2017/06/08	2017/08/15	2017/10/18	2018/05/09	2018/08/17	2018/10/17
Sampl ng T me	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	9 00	9 45	9 50	9 30	8 20	9 30 AM
FIELD DATA																											
Secch Depth	Mete s	--	--	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	2.7	2 1	5.3	4.2	2.1	4.6	2 7	3.1	3.01	3.8
Wate Temp	Cels us	--	--	--	--		14.7	10.5	26 1	16.6	13.3	22.7	14.7	13 7	22.9	12.8	14.1	25.4	9.4	12.2	22.2	12.7	16 8	21.0	14.6	12.7	24.5	13 1
D ssolved Oxygen	mg/L	--	--	--	5.5 - 9.5		9.4	7.9	7.9	8.2	9.7	8.9	8.6	15 8	7.6	7.9	8.3	8.8	7.6	10.5	8.4	9.9	8.7	7.1	7 2	10.42	6.42	7.6
pH (n S tu)	pH	--	--	5 0-9.0	6.5 - 9.0		6.5	7.8	6.7	6.7	6.2	8.6	6.5	6.8	7.9	6.6	7.8	6.8	7.1	9 8	7.1	5.7	7.0	6.8	7 1	6 74	7.14	6.67
Spec f c Conductance	uS/cm	--	--	--	--		111.9	230.0	229.0	189.0	219.5	202.1	212.9	472.0	251.0	211.0	0.2	249.8	240 8	209.0	267.0	243.2	219.0	246.0	257.0	196.4	244.9	236.4
INORGANICS																											
Total Alkal n ty (as CaCO3)	mg/L	5	--	--	--		9	21	8	5	5	6	5	32	5	5	5	6	7	5	7	9	5	7	9	5	7	26 0
D ssolved Chlo de (Cl)	mg/L	1	--	--	120		37	55	57	48	58	44	46	61	47	47	59	58	58	54	56	53	65	58	60	56	49	47 0
Colou	TCU	5	--	--	--		35	43	10	27	10	22	18	14	11	22	35	8	19	27	13	17	18	14	14	34	14	12 0
N t te N t ate	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	0.25	0 21	0.09	0 17	0.20	0.4
N t ate (N)	mg/L	0.05	--	--	13		--	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	0.13	0 07	0.09	0 17	0.09	0.4
N t te (N)	mg/L	0.05	--	--	0.06		--	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	0.12	0 14	0 05	0.05	0 13	0.05
N t ogen (Ammon a N t ogen) *	mg/L	0.03	--	--	18		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	0.03	0.03	0.04	0.03	0.04	0.05
Total K eldahl N t ogen as N	mg/L	0.4	--	--	--		--	0.4	2.3	1.0	--	0.6	1.1	0 4	0.5	1.1	0.3	0.4	1.8	0 5	0.4	0.7	0.4	0.4	0.4	0.4	0.4	0.4
Total O gan c Ca bon	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	4.7	4.8	3 9	4.9	2.9	3.0
O thophosphate (as 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	0.01	0.01	0 01	0.01	0.01	0.01
pH (Lab)	pH	N/A	--	5 0-9.0	6.5 - 9.0		6.6	6.7	7.1	6.5	6.7	6.9	6.9	6.6	6.8	6.6	6.6	6.9	6.9	6 7	7.2	7.0	6.7	7.1	6 9	6 70	7.15	7.5
Total Calc um (Ca)	mg/L	0.1	--	--	--		5.8	6.1	6.6	5.9	7.1	5.7	6.4	6.5	7.6	7.0	6,500.0	8.0	4.7	6 3	7.3	8.2	7.0	7.5	5.9	6.7	7.6	
Total Magnes um (Mg)	mg/L	0.1	--	--	--		1 1	1.0	1.1	1 2	1.0	1.0	1 1	1 4	1.2	1.0	930.0	1.3	0.9	1 0	1.1	1.3	1 2	1.0	1 1	1.0	1.1	1.2
Total Phospho us	mg/L	0.002	--	--	--	0.010	0.009	0.018	0.040	0 006	0.005	0.013	0.010	0.010	0.006	0.18	0.005	0.005	0.005	0 004	0.004	0.003	0.010	0.012	0.005	0.011	0.005	0.005
Total Potass um (K)	mg/L	0.1	--	--	--		0.9	0.7	0.9	0.8	0.8	0.7	1.1	0.8	1.1	0.9	720.0	0.1	0.7	0 7	0.9	1.0	0.9	0.8	0 9	0.7	0.9	0.9
Total Sod ium (Na)	mg/L	0.1	--	--	--		22.0	34.6	32 0	27.7	33.6	19.2	31.3	37 5	40.3	38.3	33.0	42.6	28.3	32.5	33.1	33.5	38 9	42.4	37.2	37.2	38.5	41.7
React ve S l ca (S O2)	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	2.1	1.6	1 7	2.4	1.7	3.4
Total Suspended Sol ds	mg/L	5	--	--	Comment 1		1	5	5	5	5	5	5	5	5	5	1.0	5	5	5	5	5	5	5	5	5	5	5
D ssolved Sulphate (SO4)	mg/L	2	--	--	--		9	7	8	8	8	7	8	9	8	8	8	9	8	10	10	10	10	8	10	8	7.0	11 0
Tu b d ty (NTU)	NTU	0.1	--	50	--		0.9	1.1	0.7	0.9	0.7	0.8	0.4	1.1	0.4	0.8	0.7	1.0	1.0	0 7	1.3	1.2	0.9	0.9	0 9	1.4	0.4	0.7
Conduct v ty (uS/cm)	uS/cm	1	--	--	--		160	215	226	189	232	223	204	228	246	225	220	248	244	208	267	196	248	249	246	247	247	286.0
Calculated Parameters																											
An on Sum	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	2.06	1 96	2.09	1.76	1.68	2.1
B ca b. Alkal n ty (calc. as CaCO3)	mg/L	5	--	--	--		9	21	8	5	5	6	5	32	5	5	5	6	7	5	7	9	5	7	9	5	7	26 0
Calculated TDS	mg/L	1	--	--	--		84	118	111	96	110	82	98	136	106	103	120	124	106	105	114	113	125	122	123	110	108	127.0
Ca b. Alkal n ty (calc. as CaCO3)	mg/L	10	--	--	--		1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Cal on Sum	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	2.20	2 30	2.12	2.04	2.13	2.3
Ha dness (CaCO3)	mg/L	N/A	--	--	--		19.00	19.30	21.00	19.70	21.80	18.40	20.50	22.00	23.90	21.60	20.00	25.30	15.40	19 80	22.80	25.80	23.40	21.60	23 30	18.9	21.3	23 9
Ion Balance (% D ffe ence)	%	N/A	--	--	--		2.16	4.70	2.60	2.00	3.20	10.60	6.70	9.40	20.30	17.50	1 84	10.20	10.80	3.20	0.40	3.00	3.40	8 10	0.70	7.3	11.8	5.0
Langel e Index (@ 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	-3.29	-2.82	-2.84	-3.42	-2.77	-1 8
Langel e Index (@ 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	-3.61	-3.14	-3.16	-3.74	-3.09	-2 2
Satu at on pH (@ 20C)	N/A	N/A	--	--	--		9.63	9 49	9.87	10.10	10.00	10.00	10.10	9.28	10.00	10.00	9 81	9.92	10.10	10 10	9.88	9.72	10.00	9 91	9.77	10.1	9.92	9.3
Satu at on pH (@ 4C)	N/A	N/A	--	--	--		9.88	9 81	10.20	10.40	10.40	10.40	10.40	9.60	10.30	10.40	10.10	10.20	10.40	10 40	10.20	10.00	10.30	10.20	10 10	10.4	10.2	9.6
Metals (ICP-MS)																											
Total Alum num (Al)	ug/L	5	5	--	5 - 100		--	222	52	154	136	58	61	224	53	108	180	---	79	163	--	--	156	45	44	172	30	-
Total Ant mony (Sb)	ug/L	2	20	--	--		--	2	2	2	2	2	2	2	2	2	1.0	---	2	2	--	--	2	--	2	2	2	-
Total A sen c (As)	ug/L	2	5.0	--	5		--	2	2	2	2	2	2	2	2	2	1.0	---	2	2	--	--	2	--	2	2	2	-
Total Ba ium (Ba)	ug/L	5	1000	--	--		--	18	16	15	19	9	16	16	17	17	17	---	19	14	--	--	17	--	17	13	13	-
Total Be yll um (Be)	ug/L	2	5.3	--	--		--	2	2	2	2	2	2	2	2	2	1.0	---	2	2	--	--	2	--	2	2	2	-
Total B smuth (B)	ug/L	2	--	--	--		--	2	2	2	2	2	2	2	2	2	2.0	---	2	2	--	--	2	--	2	2	2	-
Total Bo on (B)	ug/L	5	1200	--	1500		--	6	9	15	7	7	9	7	6	10	50	---	5	7	--	--	5	--	10	5	9	-
Total Cadm um Cd)	ug/L	0 017	0.01	--	0.09		--	0.022	0.027	0.029	0.024	0.017	0.034	0.036	0.017	0.024	0.035	---	0.352	0.014	--	--	0.025	--	0.017	0.09	0.09	-
Total Ch om um (C)	ug/L	1	---	--	1		--	1	1	5	1	1	1	6	1	1	1.0	---	7	1	--	--	2	--	1	1	1	-
Total Cobalt (Co)	ug/L	1	10	--	--		--	1	1	1	1	1	1	1	1	1	0.40	---	1	1	--	--	1	1	1	1	1	-
Total Coppe (Cu)	ug/L	1	2	--	2		2.0	2	2	2	2	1	1	1	1	5	2.0	1	1	1	1	1	1	1	1	1	1	1.0
Total I on (Fe)	ug/L	50	300	--	300		175	160	78	120	111	70	79	111	50	119	100	123	158	96	55	88	59	50	106	80	81	50
Total Lead (Pb)	ug/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	--	--	0 5	--	0.5	0.9	0.5	-
Total Manganese (Mn)	ug/L	2	820	--	--		36	30	14	37	35	13	12	40	18	25	34	24	35	23	15	17	24	11	13	24	15	14 0
Total Molybdenum (Mo)	ug/L	2	73	--	73		--	2	2	2	2	2	2	2	2	2	2.0	---	2	2	--	--	2	--	2	2	2	-
Total N ckel (N)	ug/L	2	25	--	25 - 150		--	2	2	5	2	2	2	2	2	2	2.0	---	3	3	--	--	14	--	2	2	2	-
Total Selen um (Se)	ug/L	1	1.0	--	1		--	1	1	1	1	1	1	1	1	1	1.0	---	1	1	--	--	1	--	1	1	1	-
Total S lve (Ag)	ug/L	0.1	0.1	--	0.25		--	0.1	0 1	0.1	0.1	0.1	0.1	0 1	0.1	0 1	0.10	---	0.1	0.1	--	--	0 1	--	0.1	0.1	0.1	-
Total St ont um (S)	ug/L	5	21000	--	--		--	27	31	29	31	18	31	31	30	30	29	---	23	28	--	--	32	--	38	28	35	-
Total Thall um (Tl)	ug/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	0.1	---	0.1	0.1	--	--	0 1	--	0.1	0.1	0.1	-
Total T n (Sn)	ug/L	2	--	--	--		--	2	2	2	2	2	2	2	2	2	2	---	2	2	--	--	2	--	2	2	2	-
Total T tan ium (T)	ug/L	2	--	--	--		--	3	2	2	2	2	2	2	2	2	2	---	2	2	--	--	2	--	2	2	2	-
Total U an ium (U)	ug/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	--	--	0 1	--	0.1	0.1	0.1	-
Total Vanad um (V)	ug/L	2	6	--	--		--	2	2	2	2	2	2	2	2	2	2	---	2	2	--	--	2	--	2	2	2	-
Total Z nc (Zn)	ug/L	5	30	--	30		9	5	5	64	11	7	5	10	5	10	14	6	12	10	5	5	11	8	5	8	5	7.0
MICROBIOLOGICAL																											
Total Col fo m	MPN/100mL	1	--	--	--		--	461	613	93	461	308	461	42	629	>2470	---	356	163	179	517	2,420	260	577	>2420	58	601	6 000 0
E. col	MPN/100mL	1	--	400	--		100	14	2	6	6	6	4	1	1	17	10	1	2	1	23	44	1	5	517	8	1	11 0
Chlo ophy l A - Ac d f cat on method	ug/L	0.05	--	--	--		0.91	0 30	1.20	1.09	1 44	2.20	0.64	0.20	0.61	0.90	0 48	1.22	2.71	1 52	1.20	2.32	1.09	1 43	1.22	6 25	1.28	1.7
Chlo ophy l A - Welschmeye method	ug/L	0.05	--	--	--		0.85	0 33	1.00	1.41	1 59	2.40	0.62	0.20	0.54	0.84	---	1.26	1.44	1.86	1.57	2.34	1.28	1 40	1.33	3 35	--	*

Notes

N/A - Not Appl cable NC - Not Calculable NCC Not Collected

RDL = Repo ted Detect on L m t (eq esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft Septembe 2009) (Refe enced)

Nova Scot a Env onment Env onmental Qual ty Standa ds fo Su face Wate (Env onmental Qual ty Standa ds (ECQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh

Bold (black shaded) = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Unde l ined (Black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Hea th Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Highway 102																													
Sample Sites							HWY102-1																													
Sampling Date	yyyy-mm-dd	--					NC	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	2015/08/25	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Sampling Time	hh:mm	--						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: 0	12:00	10:10	9:30	13:15	09:20	9:40	14:30	11:00	0:20	12:00	15:00	11:40	12:40	11:00	15 40 00 PM
FIELD DATA																																				
Secchi Depth	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--		11.8	8.8	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	14.3	20.7	5.4	13.4	19.3	9.2	16.4	22.1	10.1	14.4	21.4	10.6
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		11.4	5.8	4.3	8.2	4.3	6.1	8.2	3.9	5.3	5.7	1.0	3.8	7.6	3.3	3.1	12.0	2.1	4.5	4.3	3.8	5.0	8.2	10.1	7.4	5.8	5.8	5.6	7.1	2.8	6.1
pH (In Situ)	pH	--	--	5.0-9.0	6.5 - 9.0		8.0	5.4	5.3	6.3	5.3	5.6	5.8	5.8	6.0	8.8	5.7	6.4	6.2	7.1	6.8	6.0	6.6	5.1	6.4	6.2	6.9	7.3	6.1	5.7	6.4	7.8	6.3	6.1	6.1	6.7
Specific Conductance	uS/cm	--	--	--	--		194.0	153.0	103.8	135.0	106.0	108.6	114.1	107.6	88.6	288.0	225.0	155.5	226.0	173.2	234.0	880.0	337.0	09.0	0.4	335.8	251.2	289.0	353.0	208.9	354.0	257.0	266.0	232.2	280.5	189.4
INORGANICS																																				
Total Alka inity (as CaCO3)	mg/L	5	--	--	--		<5	<5	<5	<5	<5	<5	<5	5	11	8	22	25	15	9	23	20	31	28	30	16	21	12	14	27	10	17	21	16	13	26	12.0
Dissolved Chloride (Cl)	mg/L	1	--	--	120		24	38	24	32	25	22	24	19	12	58	48	28	53	31	40	65	57	19	130	67	49	71	87	35	101	49	51	51	54	61.0
Colour	TCU	5	--	--	--		67	68	57	37	89	53	39	65	79	24	65	40	9	65	25	11	31	93	22	27	29	23	37	64	24	31	29	27	56	68.0
Nitrite Nitrate	mg/L	0.05	--	--	--		<0.05	<0.05	<0.05	0.69	<0.05	1.20	0.69	0.25	1.20	2.61	0.06	0.43	0.51	<0.05	<0.05	<0.05	<0.05	0.53	<0.050	<0.05	0.17	0 05	0.13	0.53	0.35	0.71	0.58	0.37	0.11	0.2
Nitrate (N)	mg/L	0.05	--	--	13		<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	<0.05	0.17	0 05	<0.05	0.53	0.18	0.50	0.58	0.37	<0.05	0.2
Nitrite (N)	mg/L	0.05	--	--	0 06		<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	<0.05	0.13	<0.05	0.17	0.21	<0.05	<0.05	0.11	0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		<0.05	0.29	<0.05	<0.05	<0.05	<0.05	0.05	0.10	0.07	0.31	0.19	0.04	<0.03	0.05	0.06	<0.03	0.04	0.03	<0.050	<0.03	0.04	0 06	0.06	<0.03	<0.03	0.10	0.07	<0.03	0 07	0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	1.1	1.3	0.6	--	0.6	0.6	0.7	0.6	<0.4	0.3	0.5	0.6	0.7	1.2	0.7	0.5	1.3	3.8	1.1	0.70	0.4
Total Organic Carbon	mg/L	0.5	--	--	--		6.5	0.0	7.7	4.7	11.0	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	14.6	8.4	4.5	8.0	11.5	7.4	8.6	6.9	5.0	7.7	7.0
Orthophosphate (as 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	<0.01	<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	<0.01	0.01	<0.01	<0.01	<0.01	0.01
pH (units)	pH	N/A	--	5.0-9.0	6.5 - 9.0		4.5	5.2	5.4	5.5	6.2	5.3	6.4	6.6	6.3	6.4	6.9	6.8	6.9	6.9	6.7	6.6	7.5	5.9	6.6	7.5	6.8	6.9	7.0	6.5	6.8	6.9	6.9	7.02	7.14	6.9
Total Calcium (Ca)	mg/L	0.1	--	--	--		1.7	1.8	1.6	4.9	3.3	5.1	4.9	5.2	5.6	12.5	11.7	7.5	11.1	10.5	13.9	7.2	23.3	2.2	18 000.0	18.0	12.4	12.9	25.8	9.9	20.9	10.3	14.6	12.5	15.6	9.9
Total Magnesium (Mg)	mg/L	0.1	--	--	--		0.3	0.5	0.5	1.1	0.8	1.1	0.9	0.9	1.2	1.7	2.0	1.4	1.4	1.5	2.3	1.6	3.2	0.6	2 400.0	2.7	2.3	1.7	2.7	1.7	3.0	1.7	2.2	1.8	2.2	1.8
Total Phosphorus	mg/L	0.002	--	--	--	0.010	0.070	0.140	0.020	0.006	0.007	0.011	0.009	0.012	0.010	0.019	0.039	0.020	0.006	0.021	0.022	0.013	0.034	0.021	0.007	0.020	0.002	0.005	0.008	0.009	0.017	0.052	0.008	0.022	0.014	0.010
Total Potassium (K)	mg/L	0.1	--	--	--		0.5	1.2	0.7	1.1	1.6	1.3	1.1	1.5	1.9	1.6	2.5	1.5	1.3	1.7	2.4	1.2	2.5	0.7	2 000.0	2.1	1.5	1.4	1.9	1.7	2.0	2.1	2.0	1.6	2.0	1.4
Total Sodium (Na)	mg/L	0.1	--	--	--		15.0	25.0	13.0	15.9	14.5	14.6	14.8	10.2	8.3	36.3	27.7	14.6	30.8	15.0	20.5	39.1	38.7	18.6	64.0	37.7	28.8	45.4	43.8	24.8	64.1	29.7	29.6	41.2	35.5	47.9
Reactive Silica (SiO2)	mg/L	0.5	--	--	--		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	4.9	4.8	1.4	6.3	4.6	1.8	3.8	5.6	2.5	5.3	4.6
Total Suspended Solids	mg/L	5	--	--	Comment 1		7	80	2	<2	11	<2	<1	1	<1	9	6	<5	<5	<5	<5	6	<5	<5	<1.0	<5	<5	<5	10	<5	<5	11	<5	<5	<5	5
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		5	3	3	8	<2	8	10	8	10	14	8	9	12	8	12	10	7	6	13	9	14	14	14	18	15	13	19	12	7.0	11.0
Turbidity (NTU)	NTU	0.1	--	50	--		14.0	35.0	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	0.6	0.9	0.8	1.0	4.1	1.0	1.3	7.7	1.1	1.7	1.1	3.2
Conductivity (uS/cm)	µS/cm	1	--	--	--		100	140	92	130	100	110	1 0	100	88	263	231	143	243	188	218	252	338	112	470	324	244	289	440	167	411	251	258	298	306	306.0
Calculated Parameters																																				
Anion Sum	me/L	N/A	--	--	--		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	2.50	1.93	2.58	3.29	1.60	3.53	2.12	2.20	1.97	2.2	2.2
Bicarb. Alka inity (calc. as CaCO3)	mg/L	5	--	--	--		<1	<1	<1	<1	<1	<1	<1	5	11	8	22	25	15	9	23	20	31	28	30	16	21	12	14	27	10	17	21	16	13	26	12.0
Calculated TDS	mg/L	1	--	--	--		50	73	45	67	50	63	65	58	54	150	117	73	117	83	104	143	150	68	240	151	116	155	193	100	218	127	131	130	133	142.0
Carb. Alkalinity (calc. as CaCO3)	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	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	me/L	N/A	--	--	--		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	2.88	2.11	2 81	3.51	1.79	4.14	2.22	2.28	2.62	2.6	2.8
Hardness (CaCO3)	mg/L	N/A	--	--	--		6.00	6.00	6.00	17.00	12.00	17.00	16.00	17.00	19.00	38.20	37.50	24.50	33.50	32.40	44.20	24.60	71.40	8.00	55.00	56.10	40.40	39.20	75.50	31.70	64.50	32.70	45.50	38.6	48	32.1
Ion Balance (% Difference)	%	N/A	--	--	--		4.35	8.20	0.68	2.30	13.40	7.37	1.48	6.74	0.00	2.60	1.90	4.60	2.40	3.50	2.60	8.40	16.40	11.20	3.19	7.10	4.70	4.40	3.10	5.70	8.00	2.20	1.80	14.0	8.3	12.1
Lange ier Index (@ 20C)	N/A	N/A	--	--	--		NC	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. 0	-3.85	-2.32	-1.57	-2.62	-2.48	-1.74	-3.14	-2.23	-2.35	-2.33	-1.85	-2.6
Lange ier Index (@ 4C)	N/A	N/A	--	--	--		NC	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	-1.89	-2.94	-2.80	-2.06	-3.46	-2.55	-2.67	-2.65	-2.17	-2.9
Saturation pH (@ 20C)	N/A	N/A	--	--	--		NC	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	9.03	9.42	9.35	8.77	9.59	9.07	9.26	9.23	9.39	8.99	9.5
Saturation pH (@ 4C)	N/A	N/A	--	--	--		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	0.10	9.18	9.35	9.74	9 67	9.09	9.91	9.39	9.58	9.55	9.71	9.31	9.9
Metals (ICP-MS)																																				
Total Aluminum (Al)	µg/L	5	5	--	5 - 100		510	--	--	169	192	--	205	--	--	134	83	146	86	145	150	187	83	310	51	--	52	81	--	--	69	450	100	72	80	--
Total Antimony (Sb)	µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		22	--	--	53	37	--	37	--	--	58	284	42	57	57	80	46	142	17	130	--	86	79	--	--	130	--	77	68	100	--
Total Beryllium (Be)	µg/L	2	5	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1 200	--	1 500		<5	--	--	11	11	--	<50	--	--	12	8	13	10	10	11	9	14	11	<50	--	<5	10	--	--	<5	--	24	11	14	--
Total Cadmium (Cd)	µg/L	0.017	0.010	--	0.090		<0.300	--	--	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	--	<0.017	<0 017	--	--	0.032	--	<0.017	<0.09	<0.09	--
Total Chromium (Cr)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	8	<1	<1	<1.0	--	<1	<1	--	--	1	--	1	<1	<1	--
Total Cobalt (Co)	µg/L	1	10	--	--		<1	--	--	1	0	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Copper (Cu)	µg/L	1	2	--	2		2	--	--	3	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	3	<2	<1	2	<1	<1	2	<2.0	<1	1	<1	<1	2	<1	4	1	1	<1	3.0
Total Iron (Fe)	µg/L	50	300	--	300		720	--	--	146	637	150	107	209	219	102	1,380	255	111	938	446	147	820	290	140	1,280	138	144	766	228	151	3,960	281	85	634	403.0
Total Lead (Pb)	µg/L	0.5	1.0	--	1.0 - 7.0		1.6	--	--	2.4	0.6	--	<0.5	--	--	<0.5	0.7	<0.5	<0.5	<0.5	0.6	2.6	<0.5	0.6	<0.5	--	<0.5	<0.5	--	--	<0.5	--	<0.5	0.8	<0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		40	--	--	55	39	67	28	21	31	34	79	28	23	45	31	56	122	61	28	95	22	19	78	38	22	511	28	9	99	71.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (N)	µg/L	2	25	--	25 - 150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	12	--	<2	6	<2	--
Total Selenium (Se)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	--	0.3		<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		11	--	--	29	20	--	24	--	--	48	58	36	52	47	62	38	103	13	85	--	39	58	--	--	92	--	76	54	88	--
Total Thal ium (Tl)	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	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--		6	--	--	<2	<2	--	4	--	--	<2	3	<2	<2	<2	4	2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Zinc (Zn)	µg/L	5	30	--	30		21	--	--	16	7	7	<5.0	<5.0	7	<5	6	<5	<5	<5	10	10	<5	7	11	<5	<5	<5	<5	6	9	37	8	6	<5	12.0
MICROBIOLOGICAL																																				
Total Coliform	MPN/100mL	1	--	--	--		84	>250	--	>250	>250	180	120	180	--	687	>2420	>2420	1 550	>2420	1 553	120	>2420	>2420	---	>2420	659	>2420	>2420		914	>2420	>2420	105	9010	370.0
E. coli	MPN/100mL	1	--	400	--		54	>250	--	12	17	5	1	78	<100	3	68	145	4	9	5	3	179	3	20	25	2	<1	86		12	14	3	<1	10	2.0
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--		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	0.50	7.27	0.36	0.94	51.51	0.33	1.56	5.32	0.62	1.57	0 86	1.1
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--		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	6.79	0.23	1.30	60.68	0.43	2.04	5.48	0.99	2.62	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Co lected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

Comment 1 CCME PAL-F efe ence values between 25-250 mg/L, and >250 mg/L.

Hea th Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

(*) Chlo ophyll A - Welschmeye Method not completed due to labo ato y s nst ument fa lu e.

Bold (black shaded) = P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Underlined (black shaded) = P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

Blue shaded = Past Resu t - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Hea th Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Highway 102																										
Sample Sites							HWY102-2																										
Sampling Date	yyyy-mm-dd	--					2009/06/29	2009/08/13	2009/10/01	2010/05/31	2010/08/24	2010/11/01	201 /05/13	2011/08/14	2011/10/16	2012/05/01	2012/08/15	2012/10/11	2013/05/15	201 /08/15	2013/10/16	2014/05/14	2014/ 0/27	2015/05/20	2015/08/25	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2107/06/08	2017/08/15	2017/10/18	2018/05/09	2018/08/17	2018/10/17
Sampling Time	hh:mm	--					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	10:07	11:00	12:58	14:30	12:50	12:45	10:40	11 45	15:25	12:25	12:30	11:30	14 15 PM
FIELD DATA																																		
Secchi Depth	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	NCC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--		16.7	19.2	16.4	17.2	17.0	8.7	0.8	24.2	15.1	7.8	23.7	14.3	11.5	22.0	10.7	11.4	10.4	12.7	23.7	9.3	13.4	20.4	10.2	13.0	22.4	15.2	14.9	18.3	10.6
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		10.0	5.9	4.8	4.9	2.5	3.0	6.9	7.0	5.1	3.7	13.1	3.3	6.3	1.6	4.2	10.5	9.3	4.2	6.1	5.3	6.8	7.1	6.8	5.7	1.8	11.3	8.8	2.3	5 6
pH (in Situ)	pH	--	--	5.0-9.0	6.5 - 9.0		6.6	5.7	5.4	6.3	5.9	5.6	6.2	5.9	5.3	7.3	6.4	6.7	6.0	6.9	5.4	5.4	5.9	6.5	6.0	6.0	5.9	6.2	5.4	6 0	7.6	8.3	6.1	5.9	7 2
Specific Conductance	uS/cm	--	--	--	--		37.0	457 0	162.1	415.0	167.0	101.2	92.2	123.1	96.0	225.0	226.0	159.1	288.0	188.5	204.4	204.4	174.0	0.4	699.0	197.6	968.0	838.0	219.2	400.0	414.0	338 0	355.6	394.7	246.4
INORGANICS																																		
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--		<5	<5	7	6	5	<5	<5	5	<5	17	7	<5	6	14	7	30	8	8	5	<5	13	21	6	<5	22	11	9	21	13.0
Dissolved Chloride (Cl)	mg/L	1	--	--	120		21	82	83	170	41	18	21	21	17	63	109	45	71	50	52	113	34	260	178	78	236	226	48	136	107	92	79	90	30.0
Colour	TCU	5	--	--	--		120	190	91	96	160	68	65	98	77	32	100	70	11	61	36	13	85	17	9	8	14	39	86	20	41	22	25	85	85.0
Nitrite Nitrate	mg/L	0.05	--	--	--		<0.05	<0.05	<0.05	0.10	<0.05	0.62	0.26	1.80	3.20	1.54	<0.05	0.14	0.17	<0.05	<0.05	<0.05	0.12	<0.050	<0.05	0.15	0.21	0.23	0.11	0.20	0.09	0.07	0.33	0.21	0 8
Nitrate (N)	mg/L	0.05	--	--	13		<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	<0.05	0.15	<0.05	<0.05	0.11	<0 05	0.09	0.07	0.16	<0.05	0 8
Nitrite (N)	mg/L	0.05	--	--	0.06		<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	<0.05	<0.05	0.21	0.23	<0.05	0.20	<0.05	<0.05	0.17	0.21	0 05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		<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	0.06	0.19	0.05	0.14	0.37	<0.03	<0 03	0.09	0.14	<0.03	0.24	0.06
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.6	1.1	0.5	--	0.7	2.0	15.3	<0.4	0.3	62.6	2.0	24.3	2.1	0.6	<0.4	0.7	0.6	1.4	0.90	0.4
Total Organic Carbon	mg/L	0.5	--	--	--		8.5	13.0	13.0	7.2	14.0	7.4	5.7	9.2	8.4	7.0	15.8	11.2	6.1	0.6	5.1	17.4	8.0	3.0	29.0	9.9	79.3	11.1	13.4	5.4	9.2	5.9	5.6	7.5	8 0
Orthophosphate (as 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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0 01	<0.01	<0.01	<0.01	<0.01	0 01
pH (units)	pH	N/A	--	5.0-9.0	6.5 - 9.0		5.4	6.0	6.3	6.1	6.3	5.5	5.9	6.2	5.9	5.9	6.7	6.8	6.6	6.6	6.3	7.2	6.4	6.1	6.6	6.2	6.5	6.8	6.2	6 2	6.7	6.5	6.79	6.79	7 1
Total Calcium (Ca)	mg/L	0.1	--	--	--		1.6	4.0	4.8	7.4	3.8	4.0	3.1	2.2	3.8	7.0	8.4	5.6	7.6	8.5	8.2	14.1	9.5	20 000.0	33.3	9.8	23.9	23.8	8.6	13.3	14.7	14.7	11.5	12.5	16.5
Total Magnesium (Mg)	mg/L	0.1	--	--	--		0.4	0.7	0.9	1.0	0.6	1.0	0.7	0.7	1.4	1.2	1.4	1.2	1.2	1.3	2.2	3.1	1.8	2 500.0	32.7	2.2	3.2	2.5	1.7	2.5	1.9	2.1	1.4	1.7	1 9
Total Phosphorus	mg/L	0.002	--	--	--	0.010	<0.02	0.041	0.034	0.010	0.028	0.003	0 009	0.019	0.041	0.021	0.054	0.030	0.014	0.028	0.199	0.028	0.201	0.010	1.560	0.012	0.222	0.034	0.012	0.014	0.042	0.011	0.034	0.005	0.014
Total Potassium (K)	mg/L	0.1	--	--	--		0.5	0.8	1.1	1.0	1.0	1.4	0.8	1.3	1.9	1.2	1.7	1.6	1.3	1.5	2.5	2.9	1.7	1 900.0	12.5	1.1	4.0	2.1	1.4	1.1	1.6	1.6	1.3	1.6	1 7
Total Sodium (Na)	mg/L	0.1	--	--	--		15.0	51.0	55.0	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	150.0	124.0	36.8	149.0	124.0	26.4	68.8	66.0	55.2	59.4	81.6	29.4
Reactive S lica (SiO2)	mg/L	0.5	--	--	--		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	7.2	5.6	2.8	9.0	4.5	3.1	5.7	6.4	1.6	8.8	4 6
Total Suspended So ids	mg/L	5	--	--	Comment 1		<2	58	62	34	27	3	<1	10	14	<5	39	<5	<5	<5	194	34	<5	2	3,000	15	372	69	<5	6	7	8	12	<5	5
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		<2	3	8	11	<2	7	5	5	8	12	6	10	0	9	10	12	8	15	7	8	22	21	8	10	7	9	9	4.0	16.0
Turbidity (NTU)	NTU	0.1	--	50	--		0.7	3.8	4.2	2.6	3.1	0.5	0.4	1.2 (1)	3.9	0.6	10.8	2.0	1.5	3.3	144.0	1.1	1.1	1.2	1,490.0	9.9	131.0	54.2	1.1	2.4	9.9	12.5	7.0	13.8	1 1
Conductivity (uS/cm)	µS/cm	1	--	--	--		85	290	310	590	160	94	91	100	110	263	403	179	295	203	223	433	194	920	662	315	817	952	177	451	413	366	422	444	208.0
Calculated Parameters																																		
Anion Sum	me/L	N/A	--	--	--		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	5.27	2.38	7.39	7.25	1.65	4.06	3.61	3.01	2.62	3.06	1 5
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--		<1	<1	7	6	5	<1	<1	5	<1	17	7	<5	6	14	7	30	8	8	5	<5	13	21	6	<5	22	11	9	21	13.0
Calculated TDS	mg/L	1	--	--	--		42	150	165	282	93	52	48	62	67	143	200	86	135	100	145	235	85	460	712	138	473	422	99	233	215	187	170	209	107.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	0	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<1 0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	me/L	N/A	--	--	--		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	29.10	2.35	9.27	7.23	1.80	3.92	3.93	3.60	3.36	4.53	2 3
Hardness (CaCO3)	mg/L	N/A	--	--	--		6.00	13.00	16.00	23.00	12.00	14.00	11.00	8.00	15.00	22.40	26.70	18.90	23.90	26.60	29.50	48.00	31.10	59.00	218.00	33.50	72.90	69.70	28.50	43.50	44.50	45.40	34.5	38.2	49.0
Ion Balance (% Difference)	%	N/A	--	--	--		14.90	5.58	4.90	10.30	17.50	10.30	5.81	4.60	6.01	3.30	3.60	3.10	2.30	11.30	31.70	1.60	15.10	0.06	69.40	0.50	11.30	0.10	4.30	1.80	4.20	8.90	12.4	19.4	21.8
Langelier Index (@ 20C)	N/A	N/A	--	--	--		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	-2.81	-3.73	-2.70	-2.15	-3.72	-3.58	-2.38	-2.90	-2.81	-2.41	-2.2
Langelier Index (@ 4C)	N/A	N/A	--	--	--		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	-3.13	-4.05	-3.02	-2.47	-4.04	-3.90	-2.70	-3.22	-3.13	-2.73	-2.5
Saturation pH (@ 20C)	N/A	N/A	--	--	--		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	9.45	9.91	9.16	8.95	9.87	9.80	9.11	9.41	9.60	9.2	9 3
Saturation pH (@ 4C)	N/A	N/A	--	--	--		NC	NC	10.10	10.00	10.30	NC	NC	10.50	NC	9.85	10.20	10.50	10.30	9.83	10.20	9.32	10.00	9.54	9.77	10.20	9.48	9.27	10.20	10.10	9.43	9.73	9.92	9.52	9 6
Metals (ICP-MS)																																		
Total Aluminum (Al)	µg/L	5	5	--	5 - 100		270	--	--	189	368	--	260	--	--	145	466	259	130	138	2,760	400	216	100	--	129	3,880	--	--	99	149	542	67	152	--
Total Antimony (Sb)	µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		<2	--	--	<1.0	2	--	<1.0	--	--	<2	<2	<2	<2	<2	6	<2	<2	<1.0	--	<2	3	--	--	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		20	--	--	53	28	--	27	--	--	49	74	33	44	43	213	381	63	140	--	147	762	--	--	151	--	122	96	146	--
Total Beryl ium (Be)	µg/L	2	5	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1 200	--	1 500		<5	--	--	8	8	--	<50	--	--	10	17	15	9	10	13	11	12	<50	--	<5	9	--	--	<5	--	12	7	11	--
Total Cadmium (Cd)	µg/L	0.017	0.0 0	--	0.090		<0.300	--	--	0.051	<0 017	--	<0.017	--	--	0.037	0.031	0.032	0.019	<0.017	0.096	0.051	0.019	0.100	--	<0.017	0.778	--	--	0.019	--	0.048	<0.09	<0.09	--
Total Chromium (Cr)	µg/L	1	1	--	1		<2	--	--	<1.0	1	--	<1.0	--	--	<1	<1	<1	<1	1	9	2	<1	<1.0	--	<1	8	--	--	<1	--	2	<1	2	--
Total Cobalt (Co)	µg/L	1	10	--	--		<1	--	--	1	1	--	<0.40	--	--	<1	1	1	<1	1	3	1	<1	2	--	3	4	--	--	<1	--	2	<1	2	--
Total Copper (Cu)	µg/L	1	2	--	2		2	--	--	<2.0	<2.0	<2 0	<2.0	3	3	<2	3	3	<2	1	12	4	2	<2.0	404	2	13	<1	2	<1	1	3	2	1	2 0
Total Iron (Fe)	µg/L	50	300	--	300		880	--	--	1,380	3,850	303	229	897	1,110	214	5,210	1,550	383	1 720	28,400	1,660	485	960	217,000	714	21,300	7,380	375	369	2,650	4,760	870	3600	93.0
Total Lead (Pb)	µg/L	0.5	1 0	--	1.0 - 7.0		1.9	--	--	1.6	2.7	--	0.6	--	--	<0.5	5.2	2.1	0.6	0.7	19.4	3.5	1.0	<0.50	--	0.6	39.7	--	--	<0.5	--	3.3	2.3	1	--
Total Manganese (Mn)	µg/L	2	820	--	--		110	--	--	387	135	53	41	106	176	78	219	207	83	173	327	212	93	470	2,800	303	586	359	71	125	160	215	55	262	10.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	--	25 - 150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	4	2	<2	<2.0	--	<2	8	--	--	6	--	3	<2	<2	--
Total Selenium (Se)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total S lver (Ag)	µg/L	0.1	0.1	--	0.3		<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		11	--	--	37	21	--	17	--	--	33	45	31	39	40	45	75	43	96	--	38	96	--	--	72	--	80	53	81	--
Total Thallium (Tl)	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	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--		4	--	--	<2	6	--	5	--	--	<2	10	4	4	<2	60	9	6	<2	--	<2	41	--	--	<2	--	15	4	3	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	--	<0.1	0.2	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	2	<2	<2	<2	11	<2	<2	<2.0	--	<2	3	--	--	2	--	3	<2	2	--
Total Zinc (Zn)	µg/L	5	30	--	30		12	--	--	14	12	9	6	9	13	<5	7	12	12	<5	46	36	17	27	1,210	10	170	22	11	14	9	19	12	6	69.0
MICROBIOLOGICAL																																		
Total Col form	MPN/100mL	1	--	--	--		28	>250	--	>250	>250	75	41	110	>250	--	1 553	>2420	>2420	2 420	1 990	>2420	687	>2420	---	>2420	328	>2420	>2420	>2420	>2420	>2420	>2420	>2420	6	410	81.0
E. coli	MPN/100mL	1	--	400	--		4	230	--	9	5	<1	7	>250	<100	<1	16	50	111	9	4	<1	<1	<10	201	2	1	20	11	<1	8	41	1	26	3 0
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--		0.90	82.63	48.17	0.85	16.36	0.25	0.97	4.91	1.90	2.07	21.03	0.33	2.41	1.10	21.62	10.34	0.46	0.53	119.14	6.24	539.78	54.98	0.43	1.40	2.11	28.94	2.56	2.58	0 5
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--		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	129.77	2.23	793.90	73.67	0.56	1.74	3.20	37.67	4.28	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Co lected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel v y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (September 2009)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

Bold (black shaded)	= P esent Result - Pa amete concent at on exceeds CCME FWAL Gu del ne.
Unde l ned (black shaded)	= P esent Result - Pa amete concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty
Blue shaded	= Past Result - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Lake Shore Drive																								
Sample Sites																														LSD	
Sampling Date	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	2011/10/17	2012/05/01	2012/08/15	2012/10/11	2013/05/15	2013/08/15	2013/10/16	2014/05/15	2014/10/27	2015/05/20	2015/08/25	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/09	2018/08/17	2018/10/17
Sampling Time	hh:mm	--					12:00	09:30	11:45	09:00	11:28	10:00	08:45	13:20	9:00	9:15	13:00	9:10	08:40	15:30	11:55	9:30	13:30	09:50	16:02	13 40	15:00	12:10	12:25	10:20	11:55	11:05	11:30	10:30	10 50 AM
FIELD DATA																																		
Secchi Depth	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	NCC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--		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	10.5	12.5	24.3	5 8	13.2	24.0	9.4	15.6	23.0	9.7	14.4	22.4	9.3
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		10.8	5.7	5.5	8.6	5.4	8.5	9.4	7.9	8.2	4.1	2.7	7.6	8.8	7.3	7.6	14.8	7.2	6.3	7.3	7 2	8.2	1.9	8.7	11.4	7 0	5.3	9.1	6.9	7.2
pH (in Situ)	pH	--	--	5.0-9.0	6.5 - 9.0		7.9	6.7	6.3	6.4	6.6	6.2	7.1	6.9	6.6	8.2	7.2	6.9	5.2	7.3	6.2	7.0	6.3	6.9	6.3	6 5	6.6	6.2	6.7	6.8	6.6	5.9	5.8	6.4	5.9
Specific Conductance	uS/cm	--	--	--	--		723.0	210.0	167.7	217.8	203.2	110.3	145.9	126.4	111.9	62.0	177.5	116.7	123.6	132.5	147.8	180.0	111.0	0.1	155.3	132.3	162.0	254.0	162.2	150.0	188.0	92.0	75.0	182.9	108.1
INORGANICS																																		
Total A kalinity (as CaCO3)	mg/L	5	--	--	--		13	16	12	13	21	9	9	15	12	21	14	11	8	20	11	35	10	11	7	9	11	22	8	12	26	20	9	27	9.0
Dissolved Chloride (C)	mg/L	1	--	--	120		41	34	31	49	45	25	38	27	22	22	33	23	39	32	23	29	23	32	27	26	39	45	31	43	38	36	23	32	20.0
Colour	TCU	5	--	--	--		32	27	37	20	26	33	32	41	49	13	20	40	10	21	25	9	31	20	11	26	25	26	24	25	31	21	36	40	65.0
Nitrite Nitrate	mg/L	0.05	--	--	--		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. 8	0.20	<0.05	0 09	0.11	0.15	0.25	0. 0	0.08	0.08	<0.05	0.19	0.48	0.22	0.32	<0.05	0.1
Nitrate (N)	mg/L	0.05	--	--	13		0.14	--	--	0.23	0.10	--	0.25	--	--	0.13	0.80	<0.05	0. 8	0.20	<0.05	0 09	0.11	0.15	0.16	0. 0	0.08	0.08	<0.05	0.10	0.39	0.22	0.32	<0.05	0.1
Nitrite (N)	mg/L	0.05	--	--	0.06		<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	0.09	<0 05	<0.05	<0.05	<0.05	0.09	0.09	<0.05	<0.05	<0.05	0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		<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	0.11	<0 03	0.06	0.10	<0.03	<0.03	0.08	0.04	<0.03	0 06	0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	0.5	3.5	0.5	--	0.7	3.0	1.0	<0.4	0.3	77.4	2 8	2.2	11.8	0.5	1.0	34.5	10.0	<0.4	1.70	0.4
Total Organic Carbon	mg/L	0.5	--	--	--		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	14.1	9 9	5.5	14.0	8.9	7.7	8.1	6.9	5.8	5.8	8.0
Orthophosphate (as 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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0 01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
pH (units)	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.7	6.7	6.9	7.1	7.3	6.7	6.7	6.8	6.5	6.2	6.9	6.9	6.9	7.0	6.5	6.5	6.7	7.0	6.6	6.7	6.7	7.0	6.4	6.9	7.1	7.0	6.91	7 20	7.0
Total Calcium (Ca)	mg/L	0.1	--	--	--		6.5	6.9	5.4	8.0	0.5	5.3	5.9	5.1	5.0	2.6	18.1	5.1	6.4	6.0	5.6	5.4	5.1	6 100.0	52.2	5.4	6.6	9.9	4 8	7.1	8 0	6.7	4.4	10.2	3.5
Total Magnesium (Mg)	mg/L	0.1	--	--	--		1.4	1.6	1.3	2.0	2.1	1.2	1.3	1.2	1.2	0.7	3.3	1.4	1.2	1.4	1.6	1.5	1.1	1 300.0	23.0	1.5	1.4	1.8	1.3	1.6	1.7	1.6	1.1	2.3	0.9
Total Phosphorus	mg/L	0.002	--	--	--	0 010	0.002	0.030	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. 49	0.031	0.011	0.501	0.095	1.250	0.023	0.012	0.102	0.059	0.015	0.052	0.305	0.018
Total Potassium (K)	mg/L	0.1	--	--	--		1.2	1.1	1.3	1.2	1.2	1.0	1.1	1.0	1.2	0.6	1.9	1.3	1.2	1.1	1.4	1.1	1.1	1 100.0	9.7	1 0	1.2	1.3	1.1	1.3	1.4	1.2	0.9	1.6	0.8
Total Sodium (Na)	mg/L	0.1	--	--	--		24.0	21.0	18.0	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	19.0	24.4	13.4	25.1	23.4	19.7	25.2	26.0	23.0	16.5	21.7	15.4
Reactive Silica (SiO2)	mg/L	0.5	--	--	--		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	4.2	4.4	1.6	3.3	3.5	1.1	2.7	4.0	2.4	2.4	3.3
Total Suspended Solids	mg/L	5	--	--	Comment 1		16	98	5	6	110	7	4	77	5	<5	16	19	<5	17	9	51	8	5	710	69	93	9 020	15	138	41	<5	<5	484	6.0
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		6	4	5	7	3	4	6	4	4	5	5	5	6	7	5	5	4	5	<2	3	5	6	7	4	3	4	5	<2	5.0
Turbidity (NTU)	NTU	0.1	--	50	--		0.6	12.0	2.5	12.0	6.2	1.0	0.6	2.5	1.7	6.7	283.0	2.1	1.1	31.6	82 6	6.6	1.4	1.2	4,430 0	5.4	65.3	206.0	7.9	53.8	21.3	15.1	2.0	72.2	2.5
Conductivity (uS/cm)	uS/cm	1	--	--	--		170	150	140	200	200	110	150	130	110	96	161	110	168	136	105	122	125	140	129	136	160	236	133	178	192	171	122	192	123.0
Calculated Parameters																																		
Anion Sum	me/L	N/A	--	--	--		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	0.92	1.00	1.43	1.84	1. 8	1.55	1.69	1.51	0.96	1.44	0.9
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--		13	8	12	13	21	9	9	15	12	21	14	11	8	20	11	35	10	11	7	9	11	22	8	12	26	20	9	27	9.0
Calculated TDS	mg/L	1	--	--	--		92	55	74	104	107	62	84	66	60	56	163	58	82	87	66	88	59	74	498	65	91	107	70	92	97	87	58	95	52.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	< 0	<10	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	me/L	N/A	--	--	--		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	31.00	1.42	1.94	2.04	1.27	1.75	1.74	1.59	1.08	2 27	1.0
Hardness (CaCO3)	mg/L	N/A	--	--	--		22.00	15.00	19.00	28.00	35.00	18.00	20.00	18.00	18.00	9.40	58.80	18.50	20.90	20.70	20.60	19.70	17.30	21.00	225.00	19.70	22.20	32.10	17.30	24.30	27.00	23.30	15.5	34.9	12.4
Ion Balance (% Difference)	%	N/A	--	--	--		0.97	9.39	0.83	3.15	4.58	3.96	1.77	5.56	2.04	20.70	63.00	6.10	1.00	5.20	25.00	3.40	11.80	2.40	94.20	17.50	15.20	5.30	3.80	6.10	1.40	2.30	6.0	22.2	6.6
Langelier Index (@ 20C)	N/A	N/A	--	--	--		-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	-2.50	-3.20	-2.97	-2.24	-3.61	-2.73	-2.19	-2.44	-3.06	-1.94	-3.1
Langelier Index (@ 4C)	N/A	N/A	--	--	--		-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	-2.82	-3.52	-3.29	-2.56	-3.93	-3.05	-2.53	-2.76	-3.38	-2.26	-3.4
Saturation pH (@ 20C)	N/A	N/A	--	--	--		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	9.09	9.88	9.72	9.25	9.99	9.65	9.27	9.45	9.97	9.14	10.1
Saturation pH (@ 4C)	N/A	N/A	--	--	--		9.68	10.00	9.78	9.57	9.26	9.91	9.85	9.68	9.80	10.10	9.52	10. 0	10.20	9.82	10. 0	9 63	10.20	9.77	9.41	10 20	10.00	9.57	10.30	9.97	9.59	9.77	10.33	9.46	10.4
Metals (ICP-MS)																																		
Total Aluminum (Al)	µg/L	5	5	--	5 - 100		99	--	--	349	189	--	217	--	--	490	19,200	186	131	93	3,420	487	141	120	--	1,960	2,150	--	--	731	48	401	142	2590	--
Total Antimony (Sb)	µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	8	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		14	--	--	15	19	--	14	--	--	11	86	12	12	7	24	15	11	12	--	27	34	--	--	32	--	11	8	53	--
Total Beryllium (Be)	µg/L	2	5	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	13	<2	<2	<2	2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	4	--
Total Boron (B)	µg/L	5	1 200	--	1 500		13	--	--	41	22	--	<50	--	--	6	24	16	10	15	15	14	16	<50	--	<5	12	--	--	<5	--	20	10	20	--
Total Cadmium (Cd)	µg/L	0.017	0.010	--	0.090		<0.300	--	--	0.018	<0.017	--	<0.017	--	--	0 029	1.050	0.023	<0.017	<0.017	0.073	0.032	<0.017	0.011	--	<0.017	0.120	--	--	0 031	--	<0.017	<0.09	0.13	--
Total Chromium (Cr)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	11	<1	<1	<1	2	<1	<1	<1.0	--	3	2	--	--	<1	--	1	<1	2	--
Total Cobalt (Co)	µg/L	1	10	--	--		<1	--	--	<0.40	1	--	<0.40	--	--	<1	14	<1	<1	<1	1	<1	<1	<0.40	--	4	4	--	--	1	--	<1	<1	6	--
Total Copper (Cu)	µg/L	1	2	--	2		<2	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	22	2	<2	1	12	2	3	<2.0	183	6	3	<1	<1	<1	<1	1	<1	4	1.0
Total Iron (Fe)	µg/L	50	300	--	300		180	--	--	554	965	120	211	388	384	161	38,900	312	236	254	4,200	593	363	230	176,000	4,570	2,790	2,190	303	1 080	375	874	239	5460	164.0
Total Lead (Pb)	µg/L	0.5	1.0	--	1.0 - 7.0		<0.5	--	--	3.0	0.5	--	<0.5	--	--	0.6	82.4	<0.5	<0.5	<0.5	5.2	0.5	<0.5	<0.5	--	5.9	4.3	--	--	0.6	--	0.7	0.7	4.3	--
Total Manganese (Mn)	µg/L	2	820	--	--		51	--	--	113	632	23	30	53	39	26	13,200	67	71	81	124	140	60	130	13,800	985	921	2,420	75	436	212	250	55	2830	58.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	--	25 - 150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	13	<2	<2	<2	2	<2	<2	<2.0	--	5	2	--	--	<2	--	<2	<2	4	--
Total Selenium (Se)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	2	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	--	0.3		<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		30	--	--	36	42	--	24	--	--	12	82	22	24	24	25	26	19	25	--	16	29	--	--	28	--	31	17	54	--
Total Thallium (Tl)	µg/L	0.1	0.8	--	0.8		<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--		<2	--	--	7	4	--	5	--	--	3	405	4	<2	2	36	6	3	3	--	41	30	--	--	14	--	7	3	36	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	1.6	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	--	0 2	0.2	--	--	<0.1	--	<0.1	<0.1	0.2	--
Total Vanadium (V)	µg/L	2	6	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	30	<2	<2	<2	2	<2	<2	<2	--	6	4	--	--	<2	--	<2	<2	4	--
Total Zinc (Zn)	µg/L	5	30	--	30		7	--	--	7	7	<5.0	<5.0	<5.0	5	<5	110	7	6	<5	15	<5	<5	<5.0	799	11	17	14	<5	8	<5	7	<5	23	5
MICROBIOLOGICAL																																		
Total Coliform	MPN/100mL	1	--	--	--		53	>250	--	>250	>250	280	85	>250	--	1 414	>2420	>2420	1 990	>2420	>2420	1 203	8	---	>2420	>2420	>2420	>2420	>2420	534	>2420	641	46	3020	2 380.0
E. coli	MPN/100mL	1	--	400	--		22	24	--	4	45	6	10	>250	<100	2	26	10	10	20	2	<1	>2420	<10	16	17	9	30	16	1	479	1	23	20	20.0
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--		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	1.60	2.02	1.91	0.32	1.02	90.33	5.12	8.22	127.14	0. 8	18.67	20.15	1.85	0.93	141.49	0.6
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--		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	2.00	2.98	1.91	0.33	1.07	121.83	4.62	13.77	185.98	0.48	25.84	24.37	2.89	1.6	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Collected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME PAL-F calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - O aft (September 2009)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

bold (black shaded)	= P esent Result - Pa ameter concent at on exceeds CCME FWAL Gu del ne.
bold, Lined (black shaded)	= P esent Result - Pa ameter concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty
blue shaded	= Past Result - Pa ameter concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Larry Uteck Blvd																	
Sample Sites							LU																	
Samp ing Date	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	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	2018/08/17	2018/10/17
Samp ing Time	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	11:20	11:45	11:25	0:15 AM	12:00	10:00	8:40	12 25 PM
FIELD DATA																											
Secchi Depth	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--		11.3	12.8	27.3	14.6	13.9	18.3	10.9	15.0	22.8	10.2	16.1	23.4	8.2	13.3	21.9	11.6	18.2	22.4	13.3	14.3	23.1	12 4
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		4.2	6.2	8.2	9.0	10.2	8.3	4.5	12.0	8.1	7.6	7.3	9.5	8.5	8.8	16.6	9.7	9.6	8.3	7.4	11.3	6.8	9.8
pH (in Situ)	pH	--	--	5.0-9.0	6.5 - 9.0		6.1	7.8	6.7	6.8	6.4	7.5	5.5	6.5	7.2	6.2	6.6	6.8	7.0	7.2	6.2	6.2	6.8	7.1	6.9	6.7	6.9	7.1
Specific Conductance	uS/cm	--	--	--	--		203.0	955 0	480.0	262.0	670.0	320.0	845.0	999.0	611.0	371.0	0.6	569.0	436.2	588.0	574.0	483.4	755.0	660.0	590.0	434.6	588.0	384.4
INORGANICS																											
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--		12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27	14	13	27	20	11	23	13 0
Dissolved Chloride (Cl)	mg/L	1	--	--	120		34	224	116	52	190	99	258	243	104	70	210	132	93	154	164	92	247	154	143	96	124	74 0
Colour	TCU	5	--	--	--		94	18	14	18	7	7	19	6	8	18	8	8	6	17	13	26	12	12	8	28	21	24 0
Nitrite Nitrate	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	2.61	1.35	0.87	1.72	1.01	0.41	1.3
Nitrate (N)	mg/L	0.05	--	--	13		--	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	0.41	2.61	1.01	0.51	1.72	0.87	0.16	1.3
Nitrite (N)	mg/L	0.05	--	--	0.06		--	<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	<0.05	0.34	0.36	<0.05	0.14	0.25	0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		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	<0.03	<0.03	0.09	0.04	<0.03	0.17	0.03
Total Kjeldahl Nitrogen 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	0.6	0.7	3 8	0.6	1.1	0.60	0 4
Total Organic Carbon	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	7.6	6.1	6 8	5.4	9.3	5.5	5.0
Orthophosphate (as 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	<0.01	<0 01	<0.01	<0.01	<0.01	0.01
pH (units)	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.4	6.7	7.2	7.2	6.9	7.1	6.5	6.4	7.4	6.4	7.0	7.3	7.2	6.9	7.4	7.0	7.3	7.4	7.1	7.01	7.46	7.3
Total Calcium (Ca)	mg/L	0.1	--	--	--		7.6	30.7	22.1	14.5	22.0	17.6	21.8	23.9	27.6	12.6	27 000.0	20.3	15.9	20.6	17.2	17.9	25.7	23.8	22.8	12.7	20.8	14 9
Total Magnesium (Mg)	mg/L	0.1	--	--	--		2.3	4.2	3.6	2.2	2.8	2.7	4.0	4.2	3.8	2.2	3 800.0	3.4	1.9	2.9	3.4	2.6	3.8	3 0	2.5	1.6	2.7	2.3
Total Phosphorus	mg/L	0.002	--	--	--	0.010	0.034	0.043	0.036	0.030	0.040	0.006	0.027	0.046	0.260	0.028	0.039	0.007	0.009	0.011	0.029	0.011	0.012	0.024	0.022	0.008	0.078	0.019	0.021
Total Potassium (K)	mg/L	0.1	--	--	--		2.1	3.2	3.6	2.5	2.6	2.8	2.9	3.1	3.7	3.0	3 300.0	2.8	1.6	2.8	2.6	2.7	3.2	3 0	2.6	2.2	2.9	2.3
Total Sodium (Na)	mg/L	0.1	--	--	--		22.7	124 0	62.2	32.3	95.1	51.7	170.0	147.0	88.1	62.7	110.0	102.0	57.8	96.4	81.1	65.6	137.0	113.0	86.9	73.0	94.7	69 9
Reactive Silica (SiO2)	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	6.7	4.6	3 6	5.9	3.5	5.4	4.7
Total Suspended Solids	mg/L	5	--	--	Comment 1		13	5	165	<5	<5	<5	<5	626	<5	<5	<1 0	<5	6	29	<5	<5	22	16	<5	52	11	5
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		21	26	25	23	26	29	33	29	20	27	27	31	30	28	23	41	32	18	33	19	15.0	24 0
Turbidity (NTU)	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	3.3	7.3	6 6	3.0	21.4	2.4	4.5
Conductivity (uS/cm)	µS/cm	1	--	--	--		190	813	482	255	732	433	840	819	605	394	790	575	462	582	739	371	849	673	610	518	620	422 0
Calculated Parameters																											
Anion Sum	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	3.91	7.99	5.32	5.24	3.40	4.3	2 9
Bicarb. A kalinity (calc. as CaCO3)	mg/L	5	--	--	--		12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27	14	13	27	20	11	23	13 0
Calculated TDS	mg/L	1	--	--	--		109	426	246	144	347	229	496	477	262	187	400	305	216	321	310	242	463	341	311	216	277	201 0
Carb. Alka inity (calc. as CaCO3)	mg/L	10	--	--	--		<1	<10	<10	<10	<10	<10	<10	< 0	<10	<10	<1 0	<10	< 0	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	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	4.06	7.65	6.74	5.21	4.04	5.52	4.1
Hardness (CaCO3)	mg/L	N/A	--	--	--		29.00	94.00	70.00	45.30	66.50	55.10	70.90	77.00	84.60	40.50	84.00	64.70	47.50	63.40	56.90	55.40	79.80	71 80	67.20	38.3	63.1	45 9
Ion Balance (% Difference)	%	N/A	--	--	--		0 29	1.30	2 20	1.40	4.70	6.80	4.50	0.60	19.40	15.20	0.59	10.60	1.40	4.70	8.80	1.80	2.20	11 80	0.30	8.7	12.5	15 9
Langelier Index (@ 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	-1.55	-2.27	-1.87	-1.43	-1.85	-2.47	-1.49	-2 0
Langelier Index (@ 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	-1.87	-2.59	-2.19	-1.75	-2.17	-2.79	-1.81	-2 4
Saturation pH (@ 20C)	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	8.97	9.23	9.13	8.83	8.98	9.48	8.95	9 3
Saturation pH (@ 4C)	N/A	N/A	--	--	--		9 63	9.34	9.46	9.62	9.84	9.36	9.79	9.12	9.19	10.10	9.15	9.44	9.63	9.53	9.29	9.55	9.45	9.15	9.30	9.80	9.27	9 7
Metals (ICP-MS)																											
Total Aluminum (Al)	µg/L	5	5	--	5 - 100		--	218	227	252	107	447	31	1,400	46	109	59	--	66	1,420	--	--	61	978	29	231	25	--
Total Antimony (Sb)	µg/L	2	20	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1 0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1 0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		--	225	201	116	133	134	119	185	157	80	150	--	111	127	--	--	132	--	111	110	143	--
Total Beryllium (Be)	µg/L	2	5	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1 0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2 0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1 200	--	1 500		--	11	17	22	10	22	18	22	20	21	<50	--	9	14	--	--	<5	--	19	9	16	--
Total Cadmium (Cd)	µg/L	0.017	0.010	--	0.090		--	0.538	0.171	0.168	0.300	0.236	0.148	0.171	0.031	0.079	0.150	--	0.176	0.426	--	--	0.069	--	0.052	0.14	<0.09	--
Total Chromium (Cr)	µg/L	1	1	--	1		--	<1	<1	<1	<1	1	<1	<1	<1	<1	<1 0	--	<1	3	--	--	<1	--	1	<1	<1	--
Total Cobalt (Co)	µg/L	1	10	--	--		--	<1	1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	2	--	--	<1	--	<1	<1	<1	--
Total Copper (Cu)	µg/L	1	2	--	2		3	<2	3	16	2	6	2	2	<1	4	2	3	3	10	<1	3	<1	14	1	4	2	5.0
Total Iron (Fe)	µg/L	50	300	--	00		2, 50	347	1,320	500	194	890	157	2,000	207	229	170	671	171	1,940	374	223	<50	3,540	289	494	090	206.0
Total Lead (Pb)	µg/L	0.5	1.0	--	1.0 - 7.0		--	0.8	0.7	1.0	<0.5	1.4	<0.5	1.8	<0.5	<0.5	<0.5	--	<0.5	3.4	--	--	<0.5	--	<0.5	1.3	<0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		129	182	485	120	87	89	26	71	182	36	110	371	61	444	148	35	77	1 870	91	91	240	40 0
Total Molybdenum (Mo)	µg/L	2	73	--	73		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2 0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	--	25 - 150		--	<2	<2	<2	<2	<2	<2	3	<2	<2	<2 0	--	<2	3	--	--	<2	--	<2	<2	2	--
Total Selenium (Se)	µg/L	1	1	--	1		--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1 0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	--	0.3		--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		--	112	94	60	93	90	96	116	111	54	120	--	43	89	--	--	104	--	111	56	115	--
Total Thallium (Tl)	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	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (T)	µg/L	2	--	--	--		--	4	3	7	3	11	2	22	<2	3	<2	--	<2	31	--	--	<2	--	<2	6	2	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	0.2	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	--	--		--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	4	--	--	3	--	<2	2	<2	--
Total Zinc (Zn)	µg/L	5	30	--	30		9	79	92	39	57	49	26	17	8	23	27	17	16	64	7	52	21	120	22	41	13	38 0
MICROBIOLOGICAL																											
Total Co iform	MPN/100mL	1	--	--	--		--	>2420	>2420	2 420	866	>2420	866	>2420	961	>2420	---	>2420	>2420	>2420	>2420	>2420	>2420	488	>2420	1 990	210	5020	330.0
E. coli	MPN/100mL	1	--	400	--		<100	<1	2	19	3	86	<1	<1	7	1,730	<10	19	6	<1	40	50	6	51	4	<1	20	30 0
Chlorophyll A - Acid fication 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	1.55	25.83	21 03	2.47	78.76	5.50	2.4
Chlorophyll A - Welschmeyer 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	1.61	31.14	24.37	2.85	131.56	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Co lected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME FWAL calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Hea th Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

Bold (black shaded)	= P esent Result - Pa ameter concent at on exceeds CCME FWAL Gu del ne.
Underl ned (black shaded)	= P esent Result - Pa ameter concent at on exceeds NSE EQS Contam nated S tes Regulat ons and/o Hea th Canada Gu del ne fo Rec eat onal Wate Qual ty
Blue shaded	= Past Result - Pa ameter concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Quality (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Paper Mill Lake																									
Sample Sites							PML1																									
Sampling Date	yyyy-mm-dd	--					2009/06/29	2009/08/13	2009/10/01	2010/05/31	20 0/08/24	2010/11/01	2011/05/13	2011/08/14	2011/10/16	2012/05/01	2012/10/11	2013/05/15	2013/08/15	2013/10/ 6	2014/05/15	2014/08/14	2014/10/27	2015/05/20	2015/08/25	2015/ 0/22	2016/05/ 6	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/08	20 8/08/17	2018/10/17
Sampling Time	hh mm	--					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	08:45	8:20	13:15	9:30	9:15	13:40	13:45	13:25	13:00	11:40	14 45 PM
FIELD DATA																																		
Secchi Depth	Meters	--	--	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	N/A	2.9	2.7	4.2	3.8	4.1	4.7	3.9	4.1	2.4	2.9
Water Temp	Celsius	--	--	--	--		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	15.1	24.0	9.3	12.8	21.6	12.1	17.2	23.0	14.4	14.4	24.7	12.3
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		10.6	8.1	6.9	8 8	7.8	10.4	10.4	8.2	9.5	8.4	8.6	10.0	7.7	9.9	12.1	7.5	8.1	7.2	8.0	8.6	8.8	6.5	13 0	7.0	7.8	8.2	9.4	5.6	8.4
pH (In Situ)	pH	--	--	5.0-9.0	6.5 - 9.0		7.4	6.6	6.6	7.1	7.4	5.9	6.3	6.2	6.1	7.6	6.6	6.4	7.2	6.3	6.6	7.4	6.6	6.9	6.3	8.0	7.6	5.9	4.6	6.9	6.7	7.3	6.3	6.8	7.2
Specific Conductance	uS/cm	--	--	--	--		561.0	279.0	223.0	265.0	234.0	124.5	176.6	173.6	105.5	366.0	186.4	215.1	199.0	250.5	431.0	263.0	2 0.0	0.2	432.1	289.1	231.0	289.0	234.3	234.0	273.0	255.0	203.7	203.8	208.1
INORGANICS																																		
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--		6	7	7	7	9	5	6	7	7	20	<5	<5	6	7	31	7	7	5	6	6	<5	8	7	<5	13	9	<5	10	8.0
Dissolved Chloride (Cl)	mg/L	1	--	--	120		39	64	58	67	61	24	44	43	18	55	45	57	57	48	63	50	46	65	57	56	59	67	50	66	63	59	57	54	47.0
Colour	TCU	5	--	--	--		54	15	21	19	12	57	32	38	65	38	29	8	15	11	17	10	30	31	7	15	18	16	20	20	18	24	28	7	31.0
Nitrite Nitrate	mg/L	0.05	--	--	--		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	0.14	0.24	0.19	0.09	0. 6	0.28	0.28	0.20	0.51	0.15	0.2
Nitrate (N)	mg/L	0.05	--	--	13		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	0.14	0.24	0.19	<0.05	0. 6	0.17	0.13	0.20	0.40	0.05	0.2
Nitrite (N)	mg/L	0.05	--	--	0.06		<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	<0 05	<0.05	<0.05	0.09	<0.05	0.11	0.15	<0.05	0.11	0.10	0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		<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 03	0.03	0.06	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	0.04	0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	<0.4	0.4	--	0.4	0.8	0.4	0.4	<5	0.5	1.2	6.0	2.6	3.4	0.4	0.5	0.8	1.1	<0.4	<0.4	0.4
Total Organic Carbon	mg/L	0.5	--	--	--		6.5	3.6	4.7	0.7	3.3	6.7	4.6	5.0	8.3	5.7	5.3	4.2	4.1	5.1	4.0	2.0	4.4	2.7	5.4	5.8	7.1	6.1	8.7	5.7	4.7	6.3	4.9	3.2	4.0
Orthophosphate (as 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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0 010	<0 01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
pH (units)	pH	N/A	--	5.0-9.0	6.5 - 9.0		6.4	6.8	6.8	6 6	7.0	6.6	6.5	6.8	6.7	6.6	6.8	6.7	6.9	6.9	6.7	7.0	6.6	6.7	7.0	6.8	6.4	6.9	6.9	6.8	7.2	6.8	6.84	7.28	7.2
Total Calcium (Ca)	mg/L	0.1	--	--	--		4.5	6.9	6.4	8.4	9.0	5.9	6.0	5.0	4.6	6.0	6.0	6.8	6.6	6.9	6.9	9.1	7.0	6 900.0	7.8	4.8	7.9	10.5	7.6	8.0	8.2	9.5	6.3	8.7	8.4
Total Magnesium (Mg)	mg/L	0.1	--	--	--		0.6	1.1	1.0	1.3	1.2	0.8	1.0	0.9	0.8	1.0	1.1	1.0	0.9	1.5	1.3	1.4	1.0	970 0	1.4	0.9	1.5	1.8	1.3	1.3	1.2	1.5	1.1	1.4	1.4
Total Phosphorus	mg/L	0 002	--	--	--	0.010	<0.02	<0.02	0.002	0.018	0.002	<0.002	0.014	0.013	0.030	0.019	0.010	0.006	0.007	0.047	0.012	0.030	0.021	0.005	0.060	0.018	0.173	0.104	0.013	0.041	0.036	0.059	0.032	0.011	0.012
Total Potassium (K)	mg/L	0.1	--	--	--		0.9	0.9	0.9	1 2	1.1	1.3	1.2	0.8	1.4	0.8	1.0	0.8	1.0	1.5	0.9	1.3	0.9	800 0	1.0	0.6	1.0	1.3	1.1	1.0	1.1	1.3	0.9	1.2	1.1
Total Sodium (Na)	mg/L	0.1	--	--	--		25.0	38.0	34.0	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	35.0	38.6	25.6	37.6	35.1	32.1	40.9	45.3	36.0	35.5	37.5	39.2
Reactive Silica (SiO2)	mg/L	0.5	--	--	--		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	2.4	2.5	2.5	0.8	2.7	1.9	1.3	1.8	2.7	1.2	2.3
Total Suspended Solids	mg/L	5	--	--	Comment 1		<2	3	9	7	<2	<1	1	<2	5	9	6	<5	<5	23	6	<5	<5	1	149	6	531	10	18	20	5	104	<5	<5	5	5
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		13	11	11	13	12	12	12	10	12	7	10	8	10	10	10	8	8	8	9	8	11	11	11	10	9	11	9	7.0	9.0
Turbidity (NTU)	NTU	0.1	--	50	--		0.4	0.5	0.6	8 2	0.9	0.5	0.6	1.0	1.2	0.7	1.0	0.7	1.1	19.2	1.4	0.9	1.5	0.5	3.8	24.2	199.0	112.0	2.6	3.3	3.2	31.3	0.7	0.5	2.1
Conductivity (uS/cm)	µS/cm	1	--	--	--		170	250	230	260	250	1 0	80	170	00	214	179	227	218	209	230	261	224	240	246	241	224	310	189	256	277	248	242	274	232.0
Calculated Parameters																																		
Anion Sum	me/L	N/A	--	--	--		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	1.93	1.88	1.91	2.29	1.79	2.09	2.24	2.09	1.83	1.88	1.7
Bicarb. Alka inity (calc. as CaCO3)	mg/L	5	--	--	--		6	7	7	7	9	5	6	7	7	20	<5	<5	6	7	31	7	7	5	6	6	<5	8	7	<5	13	9	<5	10	8.0
Calculated TDS	mg/L	1	--	--	--		93	129	118	137	134	75	00	90	63	117	95	110	109	115	140	117	102	120	126	109	141	148	108	129	137	142	112	117	112.0
Carb. Alkalinity (calc. as CaCO)	mg/L	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	me/L	N/A	--	--	--		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	2.61	1.93	3.54	3.33	1.93	2.35	2.53	3.15	1.99	2.23	2.3
Hardness (CaCO3)	mg/L	N/A	--	--	--		14.00	22.00	20.00	26 00	28.00	18.00	19.00	16.00	15.00	19. 0	19.50	21. 0	20.20	23.40	22.60	28.50	21.60	21.00	25.20	15.70	25.90	33.60	24. 0	25.30	25.40	29.90	20.3	27.5	26.7
Ion Balance (% Difference)	%	N/A	--	--	--		3.78	1.63	2.58	5.17	4.02	4.80	1.25	7.22	1.60	5.50	9.00	5.50	7.00	19.80	9.20	17.00	9.20	3.18	15.20	1.20	30.00	18.60	3.80	5.80	6.10	20.30	4.2	8.4	14.9
Langelier Index (@ 20C)	N/A	N/A	--	--	--		-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	-2.98	-3.29	-3.65	-2.82	-2.99	-3.20	-2.42	-2.92	-3.26	-2.37	-2.6
Langelier Index (@ 4C)	N/A	N/A	--	--	--		-3.82	-3.15	-3.19	-3.21	-2.68	-3.50	-3.53	-3.19	-3. 8	-3.23	-3.63	-3.67	-3.39	-3.35	-2.93	-3.11	-3.58	-3.38	-3.30	-3.61	-3.97	-3.14	-3.31	-3.52	-2.74	-3.24	-3.58	-2.69	-2.9
Saturation pH (@ 20C)	N/A	N/A	--	--	--		9.93	9.65	9.73	9.59	9.47	9.83	9.81	9.77	9.80	9.51	10.10	10. 0	9.99	9.91	9.27	9.79	9.90	9.80	9.93	10.10	10.00	9.68	9.86	10.00	9.57	9.67	10.1	9.65	9.8
Saturation pH (@ 4C)	N/A	N/A	--	--	--		10.20	9.90	9.98	9.84	9.72	10.10	10.10	10.00	10.10	9.83	10.40	10.40	10.30	10.20	9.59	10.10	10.20	10. 0	10.20	10.50	10.30	10.00	10.20	10.30	9.89	9.99	10.4	9.97	10.1
Metals (ICP-MS)																																		
Total Aluminum (Al)	µg/L	5	5	--	5 - 100		260	--	--	665	46	--	233	--	--	177	306	141	103	3,920	305	129	142	140	--	2,320	7,690	--	--	250	94	4 190	151	76	--
Total Antimony (Sb)	µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	2	<2	<2	<2	<1.0	--	<2	4	--	--	<2	--	3	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		23	--	--	35	24	--	27	--	--	22	19	20	12	40	23	23	18	21	--	34	60	--	--	22	--	58	19	12	--
Total Beryllium (Be)	µg/L	2	5	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (B)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1 200	--	1 500		8	--	--	11	9	--	<50	--	--	6	9	6	8	9	8	13	11	<50	--	<5	10	--	--	<5	--	12	6	11	--
Total Cadmium (Cd)	µg/L	0 017	0.010	--	0.090		<0.300	--	--	0.032	<0.017	--	<0.017	--	--	<0.017	0.066	0.021	0.018	0.430	<0.017	0.020	<0.017	0.025	--	0.146	0.227	--	--	0.041	--	0.179	<0.09	<0.09	--
Total Chromium (Cr)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	3	<1	<1	<1	<1.0	--	2	6	--	--	<1	--	5	<1	<1	--
Total Cobalt (Co)	µg/L	1	0	--	--		<1	--	--	1	<0.4	--	<0.4	--	--	<1	2	<1	<1	9	<1	<1	<1	<0.40	--	3	6	--	--	<1	--	6	<1	<1	--
Total Copper (Cu)	µg/L	1	2	--	2		<2	--	--	2	<2.0	<2.0	4	<2.0	2	<2	<2	<2	1	6	1	<1	2	<2.0	3	4	10	<1	<1	<1	<1	7	<1	<1	1.0
Total Iron (Fe)	µg/L	50	300	--	300		140	--	--	837	89	161	141	3 5	528	137	742	130	205	5,300	239	296	182	93	4,460	6,020	13,000	8,250	171	206	359	12 600	93	184	82.0
Total Lead (Pb)	µg/L	0.5	1.0	--	1.0 - 7.0		<0.5	--	--	1.7	<0.5	--	<0.5	--	--	<0.5	0.9	<0.5	<0.5	13.5	0.9	<0.5	<0.5	<0.5	--	6.3	13.9	--	--	<0.5	--	9.1	1.2	<0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		17	--	--	142	69	41	14	128	62	48	214	33	58	693	54	260	49	34	296	278	424	281	53	64	125	894	21	64	22.0
Total Molybdenum (Mo)	µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	--	25 - 150		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	2	<2	<2	9	<2	<2	<2	<2.0	--	5	7	--	--	22	--	6	2	<2	--
Total Selenium (Se)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	1	1	--	--	<1	--	<1	<1	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	--	0.3		<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		18	--	--	36	37	--	25	--	--	26	30	31	25	34	35	37	30	32	--	22	40	--	--	34	--	47	27	42	--
Total Thal ium (Tl)	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	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--		<2	--	--	8	<2.0	--	4	--	--	<2	4	<2	<2	65	4	<2	3	<2	--	25	106	--	--	2	--	75	<2	<2	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	0.1	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	--	0.6	0.9	--	--	<0.1	--	0.6	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	10	<2	<2	<2	<2	--	7	16	--	--	<2	--	12	<2	<2	--
Total Zinc (Zn)	µg/L	5	0	--	30		8	--	--	10	5	6	6	6	5	<5	13	8	<5	62	<5	<5	6	11	13	12	34	20	<5	11	<5	29	6	6	5
MICROBIOLOGICAL																																		
Total Coliform	MPN/100mL	1	--	--	--		200	73	--	>250	>250	>250	85	>250	--	411	2 420	866	1 730	1 011	613	2 420	>2420	---	>2420	>2420	>2420	1 410	>2420	665	>2420	166	9	400	4 000.0
E. coli	MPN/100mL	1	--	400	--		33	45	--	19	>250	2	2	34	<100	2	20	12	4	6	6	10	10	<10	3	6	>2420	34	10	6	2	<1	1	10	13.0
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--		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	8.84	4.67	8.00	4.71	1.70	4.97	4.40	4.86	1.93	1.14	1.1
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--		0.64	2.21	0.64	0.74	1.04	0.06	2.75	0.76	0.15	1 0	0.91	1.37	1.10	6.39	0.65	0.65	0.87	0.54	9.54	3.69	12.31	10.82	1.76	6.45	4.96	6.58	0.98	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Collected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s cif the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME FWAL calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Health Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009) (Refe enced)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

Bold (black shad = P esent Resu t - Pa amete concent at on exceeds CCME FWAL Gu del ne.

Blue shaded = Past Resu t - Pa amete concent at on exceeds CCME FWAL Gu del ne and/o NSE EQS Contam nated S tes Regulat ons and/o Health Canada Gu del ne fo Rec eat onal Wate Qual ty

TABLE D2: Historical Data - Bedford West Water Quality Sampling Program

Tested Parameters	Units	RDL (2017)	NSE ESQs for Surface Water (Reference)	Health Canada Guideline for Recreational Water Qua ity (Reference)	CCME Guideline PAL-F (Applied)	HRM Phosphorus Trigger Range (Applied)	Paper Mill Lake																							
Sample Sites							PML2																							
Sampling Date	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	2013/05/15	2013/10/16	2014/05/15	2014/08/14	2014/10/27	2015/05/20	2015/08/25	2015/10/22	2016/05/16	2016/08/16	2016/10/25	2017/06/08	2017/08/15	2017/10/18	2018/05/09	2018/08/17	2018/10/17
Sampling Time	hh:mm	--					13:15	13:40	13:45	14:30	16:20	13:00	12:40	16:20	16:15	13:16	13:40	11:20	11:00	9:20	8:30	11:30	13:45	9:08	13:45	10:00	9:50	14:30	14: 0	14:00	13:30	12:10	14 15 PM
FIELD DATA																															
Secchi Depth	Meters	--	--	1 2	--		2.8	2.2	2.3	N/A	3.0	2.0	2.2	2.3	2.2	2.4	3.2	N/A	N/A	N/A	3.1	NCC	N/A	2.4	2.7	2.3	2.6	2.5	2.5	2.9	2.9	3.0	2 2
Water Temp	Celsius	--	--	--	--		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	15.1	27.0	9.0	13.8	22.1	11.8	17.1	24.0	14.0	15.3	5.4	12 2
Dissolved Oxygen	mg/L	--	--	--	5.5 - 9.5		10.2	8.3	8.4	8.8	8.1	10.6	9.9	8.7	8.9	7.8	9.3	8.9	12.4	7.0	7.9	8.1	9.8	8.3	8.6	7.7	10.3	10.4	8.9	6.6	9.9	7.0	8 7
pH (in Situ)	pH	--	--	5 0-9.0	6.5 - 9.0		6.4	6.8	6.8	7.1	7.4	6.5	6.3	6.7	6.1	8.6	6.5	6.1	6.5	7.2	5.9	6.6	6.8	7.3	7.6	5.9	5.4	6.7	7.0	6.9	6.3	24.7	7 0
Specific Conductance	uS/cm	--	--	--	--		267.0	264.0	241.0	237.0	234.0	200.5	158.7	173.2	155.9	231.0	234.0	250.5	966.0	266.0	215.0	0.2	255.6	454.9	264.0	298.0	230.3	242.0	285 0	252.0	214.4	293.8	297.3
INORGANICS																															
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--		5	7	7	6	8	7	<5	8	7	21	<5	8	32	10	26	<5.0	5	7	7	10	8	5	12	11	5	11	8 0
Dissolved Chloride (Cl)	mg/L	1	--	--	120		63	63	58	62	58	50	44	43	34	55	63	64	245	50	42	69	59	57	67	67	50	67	72	60	46	55	43 0
Colour	TCU	5	--	--	--		22	17	19	20	13	23	35	38	48	39	18	8	6	7	31	26	10	9	22	13	22	18	7	19	31	21	21 0
Nitrite Nitrate	mg/L	0.05	--	--	--		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	0.32	0.23	0.10	0.11	0.18	0.27	0.07	0.16	0.17	0.13	0 2
Nitrate (N)	mg/L	0.05	--	--	13		0.14	--	--	0.19	0.11	--	0.33	--	--	0.24	0.22	<0.05	0.13	0.18	0.18	0.11	0.17	0.23	0.10	<0.05	0.18	0.16	0.07	0.16	0.17	<0.05	0 2
Nitrite (N)	mg/L	0.05	--	--	0.06		<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	0.15	<0.05	<0.05	0.11	<0.05	0.11	<0.05	<0.05	<0.05	0.13	0 05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	18		<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	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	0.05
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--		--	--	--	--	--	--	--	--	--	<0.4	--	1.7	<0.4	0.4	<5	0.2	1.2	3.0	0.6	<0.4	0.5	0.6	0.6	<0.4	<0.4	<0.4	0 4
Total Organic Carbon	mg/L	0.5	--	--	--		3.6	2.6	4.5	3.2	3.4	3.6	4.0	6.0	5.6	5.9	4.4	4.0	2.7	2.4	5.8	2.8	6.0	6.1	4.0	3.6	8.3	5.5	5.4	4.1	4.9	3.5	4 0
Orthophosphate (as 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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0 01
pH (units)	pH	N/A	--	5 0-9.0	6.5 - 9.0		6.5	6.8	6.8	6.7	7.0	6.8	6.4	6.6	6.6	6.6	6.7	6.7	7.1	7.0	6.8	6.6	7.0	7.0	6.8	7.2	6.9	6.9	7.2	7.0	6.81	7.29	7 1
Total Calcium (Ca)	mg/L	0.1	--	--	--		6.1	7.1	6.1	7.2	7.7	8.0	5.3	4.8	5.0	6.1	6.7	7.7	19.2	8.8	6.9	7 300.0	8.2	6.2	8.9	8.1	7.4	8.1	8.5	8.1	6.7	8.1	7 7
Total Magnesium (Mg)	mg/L	0.1	--	--	--		1.1	1.1	1.1	1.3	1.2	1.2	0.9	0.9	0.9	1.0	1.0	1.4	1.7	1.4	1.0	1 000.0	1.3	1.2	1.2	1.2	1.3	1.3	1.1	1.2	1.1	1.2	1 3
Total Phosphorus	mg/L	0.002	--	--	--	0.010	<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	0.018	0.008	0.012	0.008	0.012	0.003	0.005	0.018	0.013	0.006	0.047	0.005	0.012
Total Potassium (K)	mg/L	0.1	--	--	--		0.9	1.0	0.9	1.0	0.9	1.0	0.9	0.8	1.0	0.8	0.8	1.3	1.4	1.2	1.1	8 0.0	1.0	0.9	1.0	1.0	1.1	0.9	1.4	1.1	0.9	1.1	1 1
Total Sodium (Na)	mg/L	0.1	--	--	--		35.0	40.0	34.0	31.1	35.1	30.8	25.7	21.3	20.9	34.6	37.5	42.0	133.0	42.6	33.9	38.0	43.3	31.3	42.9	37.5	32.1	41.5	47.2	35.5	37.5	37.7	39 6
Reactive Si ica (SiO2)	mg/L	0.5	--	--	--		2.6	2.5	2.3	2.6	2.3	3.3	2.9	2.5	3.0	2.8	2.7	4.2	2.4	2.3	2.9	1.9	1.8	2.8	2.3	0.6	2.6	1.7	0.8	2.0	2.5	1.0	2 3
Total Suspended So ids	mg/L	5	--	--	Comment 1		2	3	<1	15	<2	11	<1	8	<1	<5	<5	<5	16	<5	<5	1	<5	<5	45	<5	<5	<5	14	<5	<5	<5	5
Dissolved Sulphate (SO4)	mg/L	2	--	--	--		11	11	11	10	10	10	9	10	9	7	9	11	27	7	7	8	9	9	12	7	10	10	8	11	7	7.0	8 0
Turbidity (NTU)	NTU	0.1	--	50	--		0.8	0.7	0.6	1.0	0.8	0.4	0.4	3.4	0.5	0.7	1.0	3.3	2.6	0.7	1.0	0.9	1.9	1.3	9.4	1.1	1.4	1.9	1.9	1.8	1.4	0.7	1 2
Conductivity (uS/cm)	µS/cm	1	--	--	--		240	250	230	230	230	210	170	170	150	213	254	277	777	273	212	260	251	246	263	319	190	259	286	255	249	289	227.0
Calculated Parameters																																	
Anion Sum	me/L	N/A	--	--	--		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	1.97	1.95	2.29	2.24	1.79	2.22	2.44	2.15	1.56	1.93	1 6
Bicarb. Alkalinity (calc. as CaCO)	mg/L	5	--	--	--		5	7	7	6	8	7	<1	8	7	21	<5	8	32	10	26	<1.0	5	7	7	10	8	5	12	11	5	11	8 0
Calculated TDS	mg/L	1	--	--	--		123	131	117	120	120	110	91	89	79	119	119	137	448	118	109	130	127	112	139	129	108	133	146	124	103	118	107.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--		<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	< 0	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10
Cation Sum	me/L	N/A	--	--	--		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	2.44	1.84	2.53	2.17	1.92	2.37	2.62	2.09	2.10	2.19	2 3
Hardness (CaCO3)	mg/L	N/A	--	--	--		20.00	22.00	20.00	23.00	24.00	25.00	17.00	15.00	16.00	19.30	20.80	25.00	54.90	27.70	21.30	23.00	25.80	20.40	27.20	25.20	23.80	25.60	25.80	25.20	21.3	25.2	24 6
Ion Balance (% D fference)	%	N/A	--	--	--		4 20	1.36	2.84	4.81	0.50	2.48	0.68	10.50	1.17	4.80	2.80	7.50	7.70	16.50	2.20	0 23	10.60	3.00	5.10	1.70	3.40	3.20	3.50	1.60	14.9	6.4	18 7
Langelier Index (@ 20C)	N/A	N/A	--	--	--		-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	-3.00	-2.97	-2.98	-2.46	-2.89	-3.13	-2.37	-2.66	-3.25	-2.35	-2.8
Langelier Index (@ 4C)	N/A	N/A	--	--	--		-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	-3.32	-3.29	-3.30	-2.78	-3.21	-3.45	-2.69	-2.98	-3.57	-2.67	-3 1
Saturation pH (@ 20C)	N/A	N/A	--	--	--		9 83	9.64	9.75	9.72	9.57	9.63	NC	9.78	9.77	9.49	10.10	9.81	8.86	9.65	9.34	NC	9.98	9.95	9.81	9.69	9.82	9.99	9.60	9.65	10.1	9.64	9 8
Saturation pH (@ 4C)	N/A	N/A	--	--	--		10.10	9.89	0.00	9.97	9.82	9.88	NC	10.00	10.00	9.81	10.40	0.10	9.18	9.97	9.66	NC	10.30	10.30	10.10	10.00	10.10	10.30	9.92	9.97	10.4	9.96	10 1
Metals (ICP-MS)																																	
Total Aluminum (A)	µg/L	5	5	--	5 - 100		130	--	--	1,030	56	--	202	--	--	189	131	107	181	52	122	130	--	278	610	--	--	215	40	34	141	75	--
Total Antimony (Sb)	µg/L	2	20	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5	--	5		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1 000	--	--		16	--	--	23	12	--	23	--	--	22	22	37	50	27	19	25	--	24	35	--	--	27	--	23	21	8	--
Total Beryl ium (Be)	µg/L	2	5	--	--		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1 200	--	1 500		6	--	--	8	9	--	<50	--	--	6	6	9	7	13	11	<50	--	<5	8	--	--	<5	--	11	6	10	--
Total Cadmium (Cd)	µg/L	0.017	0.0 0	--	0.090		<0.300	--	--	0.017	<0.017	--	0.028	--	--	0.023	0.039	0.060	0.062	0.019	0.018	0.021	--	0.145	0.042	--	--	<0.017	--	<0.017	<0.09	<0.09	--
Total Chromium (Cr)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Cobalt (Co)	µg/L	1	10	--	--		<1	--	--	1	<0.4	--	<0.4	--	--	<1	<1	2	<1	<1	<1	<0.40	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Copper (Cu)	µg/L	1	2	--	2		<2	--	--	3	<2	<2	<2	<2	<2	<2	<2	3	1,380	1	<1	2	<2.0	2	<1	<1	1	<1	<1	1	<1	<1	2 0
Total Iron (Fe)	µg/L	50	300	--	300		100	--	--	1,090	151	76	143	699	181	178	81	1,760	264	316	134	170	334	368	647	174	123	<50	203	145	104	163	165.0
Total Lead (Pb)	µg/L	0.5	1.0	--	1.0 - 7.0		<0.5	--	--	2.4	<0.5	--	<0.5	--	--	<0.5	<0.5	49.7	0.7	<0.5	<0.5	<0.5	--	0.5	1.1	--	--	<0.5	--	<0.5	<0.5	<0.5	--
Total Manganese (Mn)	µg/L	2	820	--	--		58	--	--	159	81	28	34	89	31	22	87	866	206	278	24	43	67	61	109	36	23	85	68	26	20	42	74 0
Total Molybdenum (Mo)	µg/L	2	73	--	73		<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	--	25 - 150		2	--	--	2	<2.0	--	<2.0	--	--	<2	<2	3	<2	<2	<2	<2.0	--	2	<2	--	--	4	--	<2	<2	<2	--
Total Selenium (Se)	µg/L	1	1	--	1		<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1	<1	<1	--
Total S lver (Ag)	µg/L	0.1	0.1	--	0.3		<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21 000	--	--		30	--	--	35	33	--	26	--	--	27	31	35	68	37	29	34	--	21	38	--	--	35	--	39	29	38	--
Total Thallium (T)	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	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	3	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--		<2	--	--	21	<2	--	4	--	--	<2	<2	2	3	<2	<2	2	--	4	7	--	--	<2	--	<2	<2	<2	--
Total Uranium (U)	µg/L	0.1	300.0	--	15.0		<0.1	--	--	0.1	<0.1	--	<0.1	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	--	--		<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Zinc (Zn)	µg/L	5	30	--	30		12	--	--	18	<5.0	6	7	8	10	8	11	762	<5	<5	5	14	<5	8	7	<5	<5	8	9	5	5	<5	6 0
MICROBIOLOGICAL																																	
Total Col form	MPN/100mL	1	--	--	--		49	40	--	>250	46	97	64	>250	--	261	1 410	411	291	517	>2420	---	>2420	1 120	687	>2420	>2420	1 990	>2420	1 730	1	4000	3,030.0
E. co i	MPN/100mL	1	--	400	--		10	31	--	69	<1	6	17	>250	<100	1	12	2	<1	3	16	<0.10	5	2	4	47	30	1	11	5	<1	1	30 0
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--		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	4.79	1.50	3.82	1.09	2.02	5.31	4.30	1.27	1.37	1.28	1 8
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--		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	0.70	1.56	4.59	0.74	5.04	1.42	2.12	6.60	4.23	1.47	2.22	--	*

Notes:

N/A - Not Appl cable NC - Not Calculable NCC Not Collected

RDL = Repo ted Detect on L m t (ep esents most ecent sampl ng event)

-- " = no gu del ne ava lable / Not Tested.

CCME PAL-F Canad an Counc l of M n ste s of the Env onment Gu del nes fo the P otect on of Aquat c L fe - F eshwate (updated 2011)

CCME PAL-F Gu del nes fo Alum num, Lead, Coppe and N ckel va y based on epo ted pH and wate ha dness (CCME FWAL calculat on equat ons). The la gest gu del ne value fo each espect ve element ange was always used.

**CCME PAL-F na at ve fo TSS max mum nc ease of 25 mg/L f om backg ound levels at any t me when backg ound levels a e between 25 and 250 mg/L.

Hea th Canada Gu del nes fo Canad an Rec eat onal Wate Qual ty - D aft (Septembe 2009)

Nova Scot a Env onmental Qual ty Standa ds (EQS) fo Contam nated S tes (NSE 2014) Table A2 Refe ence fo Pathway Spec f c Standa ds fo Su face Wate (ug/L) - F esh Wate

Bold (black shad
U I (I
Blue shaded

Appendix E

Laboratory Certificate of Analysis

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: Mike Smith

PROJECT: 631477

AGAT WORK ORDER: 18X398281

MICROBIOLOGY ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

WATER ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

DATE REPORTED: Nov 06, 2018

PAGES (INCLUDING COVER): 11

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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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
ATTENTION TO: Mike Smith
SAMPLING SITE:
SAMPLED BY:

Total Coliforms and E.coli Membrane Filtration

DATE RECEIVED: 2018-10-17
DATE REPORTED: 2018-11-06

		SAMPLE DESCRIPTION:		KL1		KL2	KL3		KL4	KL5	HWY-102-1
		SAMPLE TYPE:		Water		Water	Water		Water	Water	Water
		DATE SAMPLED:		2018-10-17		2018-10-17	2018-10-17		2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631332	RDL	9631337	9631338	RDL	9631339	9631340	9631341
Total Coliforms (MF)	CFU/100 mL		1	157	10	140	5020	10	8000	6000	370
E. Coli (MF)	CFU/100 mL		1	61	10	50	20	1	12	11	2

		SAMPLE DESCRIPTION:		HWY-102-2		LSD	LU		PML-1		PML-2
		SAMPLE TYPE:		Water		Water	Water		Water		Water
		DATE SAMPLED:		2018-10-17		2018-10-17	2018-10-17		2018-10-17		2018-10-17
Parameter	Unit	G / S	RDL	9631342	RDL	9631343	9631344	RDL	9631345	RDL	9631346
Total Coliforms (MF)	CFU/100 mL		1	81	10	2380	330	10	4000	10	3030
E. Coli (MF)	CFU/100 mL		1	3	10	20	30	1	13	10	30

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Canadian Drinking Water Quality - updated 2017-05
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Original signed

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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
SAMPLING SITE:

ATTENTION TO: Mike Smith
SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2018-10-17

DATE REPORTED: 2018-11-06

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD
				SAMPLE TYPE: Water	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED: 2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17
				9631332	9631337	9631338	9631339	9631340	9631341	9631342	9631343
Alkalinity	mg/L		5	7	<5	7	8	26	12	13	9
Chloride	mg/L		1	55	11	46	47	47	61	30	20
True Color	TCU		5	18	123	27	16	12	68	85	65
Nitrate + Nitrite as N	mg/L		0.05	0.21	<0.05	0.13	0.13	0.42	0.19	0.76	0.10
Nitrate as N	mg/L		0.05	0.21	<0.05	0.13	0.13	0.42	0.19	0.76	0.10
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	0.05	0.05	0.03	0.03	0.05	<0.03	0.06	<0.03
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				7.07	6.27	7.10	7.13	7.47	6.94	7.07	6.99
Total Calcium	mg/L		0.1	6.9	2.9	8.4	7.7	7.6	9.9	16.5	3.5
Total Magnesium	mg/L		0.1	1.3	0.8	1.4	1.3	1.2	1.8	1.9	0.9
Total Phosphorus	mg/L		0.002	0.008	0.004	0.006	0.004	0.005	0.010	0.014	0.018
Total Potassium	mg/L		0.1	0.8	0.6	1.1	1.0	0.9	1.4	1.7	0.8
Total Sodium	mg/L		0.1	31.7	11.8	39.9	40.6	41.7	47.9	29.4	15.4
Reactive Silica as SiO2	mg/L		0.5	1.7	3.6	1.9	2.0	3.4	4.6	4.6	3.3
Total Suspended Solids	mg/L		5	<5	<5	<5	<5	<5	<5	<5	6
Sulphate	mg/L		2	9	3	7	8	11	11	16	5
Turbidity	NTU		0.1	2.1	1.1	1.2	1.7	0.7	3.2	1.1	2.5
Electrical Conductivity	umho/cm		1	215	70	232	231	286	306	208	123
Anion Sum	me/L			1.89	0.37	1.59	1.66	2.10	2.20	1.49	0.86
Bicarb. Alkalinity (as CaCO3)	mg/L		5	7	<5	<5	8	26	12	13	9
Calculated TDS	mg/L		1	110	31	109	111	127	142	107	52
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Cation sum	me/L			1.88	0.80	2.31	2.30	2.33	2.81	2.33	0.98
Hardness	mg/L			22.6	10.5	26.7	24.6	23.9	32.1	49.0	12.4
% Difference/ Ion Balance	%			0.4	36.7	18.4	16.2	5.0	12.1	21.8	6.6
Langelier Index (@20C)	NA			-2.84	-4.11	-2.72	-2.67	-1.83	-2.59	-2.19	-3.07
Langelier Index (@ 4C)	NA			-3.16	-4.43	-3.04	-2.99	-2.15	-2.91	-2.51	-3.39
Saturation pH (@ 20C)	NA			9.91	10.4	9.82	9.80	9.30	9.53	9.26	10.1
Saturation pH (@ 4C)	NA			10.2	10.7	10.1	10.1	9.62	9.85	9.58	10.4

Original signed

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
SAMPLING SITE:

ATTENTION TO: Mike Smith
SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2018-10-17

DATE REPORTED: 2018-11-06

		SAMPLE DESCRIPTION:		KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631332	9631337	9631338	9631339	9631340	9631341	9631342	9631343
Total Copper	ug/L		1	2	1	1	1	1	3	2	1
Total Iron	ug/L		50	142	336	<50	78	<50	403	93	164
Total Manganese	ug/L		2	28	29	22	43	14	71	10	58
Total Zinc	ug/L		5	19	20	<5	7	7	12	69	<5
Chlorophyll A - Acidification Method	ug/L		0.05	1.63	0.746	1.28	1.12	1.68	1.11	0.526	0.600
Total Kjeldahl Nitrogen as N	mg/L		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

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AGAT WORK ORDER: 18X398281
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CLIENT NAME: SNC Lavalin Inc.
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ATTENTION TO: Mike Smith
SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2018-10-17

DATE REPORTED: 2018-11-06

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: LU SAMPLE TYPE: Water DATE SAMPLED: 2018-10-17 9631344	PML-1 Water 2018-10-17 9631345	PML-2 Water 2018-10-17 9631346
Alkalinity	mg/L		5	13	8	8
Chloride	mg/L		1	74	47	43
True Color	TCU		5	24	31	21
Nitrate + Nitrite as N	mg/L		0.05	1.26	0.24	0.20
Nitrate as N	mg/L		0.05	1.26	0.24	0.20
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	0.05
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01
pH				7.29	7.16	7.05
Total Calcium	mg/L		0.1	14.9	8.4	7.7
Total Magnesium	mg/L		0.1	2.1	1.4	1.3
Total Phosphorus	mg/L		0.002	0.021	0.012	0.012
Total Potassium	mg/L		0.1	2.3	1.1	1.1
Total Sodium	mg/L		0.1	69.9	39.2	39.6
Reactive Silica as SiO2	mg/L		0.5	4.7	2.3	2.3
Total Suspended Solids	mg/L		5	<5	<5	<5
Sulphate	mg/L		2	24	9	8
Turbidity	NTU		0.1	4.5	2.1	1.2
Electrical Conductivity	umho/cm		1	422	232	227
Anion Sum	me/L			2.94	1.69	1.55
Bicarb. Alkalinity (as CaCO3)	mg/L		5	13	8	8
Calculated TDS	mg/L		1	201	112	107
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10
Cation sum	me/L			4.05	2.28	2.27
Hardness	mg/L			45.9	26.7	24.6
% Difference/ Ion Balance	%			15.9	14.9	18.7
Langelier Index (@20C)	NA			-2.04	-2.60	-2.75
Langelier Index (@ 4C)	NA			-2.36	-2.92	-3.07
Saturation pH (@ 20C)	NA			9.33	9.76	9.80
Saturation pH (@ 4C)	NA			9.65	10.1	10.1

Certified By: Original signed

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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
ATTENTION TO: Mike Smith
SAMPLING SITE:
SAMPLED BY:

SNC-Lavalin Bedford West Custom Inorganics Package

DATE RECEIVED: 2018-10-17
DATE REPORTED: 2018-11-06

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: LU	PML-1	PML-2
				SAMPLE TYPE: Water	Water	Water
				DATE SAMPLED: 2018-10-17	2018-10-17	2018-10-17
				9631344	9631345	9631346
Total Copper	ug/L		1	5	1	2
Total Iron	ug/L		50	206	82	165
Total Manganese	ug/L		2	40	22	74
Total Zinc	ug/L		5	38	<5	6
Chlorophyll A - Acidification Method	ug/L		0.05	2.39	1.12	1.78
Total Kjeldahl Nitrogen as N	mg/L		0.4	<0.4	<0.4	<0.4

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

9631332 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.

9631337-9631339 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.
Ion Balance is biased high, contributing parameters have been confirmed.

9631340 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.

9631341-9631342 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.
Ion Balance is biased high, contributing parameters have been confirmed.

9631343 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.

9631344-9631346 Total Phosphorus was analysed at AGAT Mississauga.
Chlorophyll A was analysed by a sub-contracted laboratory.
Ion Balance is biased high, contributing parameters have been confirmed.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Original signed

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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
SAMPLING SITE:

ATTENTION TO: Mike Smith
SAMPLED BY:

TKN / Low Level TP (Water)

DATE RECEIVED: 2018-10-17

DATE REPORTED: 2018-11-06

		SAMPLE DESCRIPTION:		KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631332	9631337	9631338	9631339	9631340	9631341	9631342	9631343
Total Kjeldahl Nitrogen	mg/L		0.10	0.14	0.29	0.15	<0.10	0.12	0.25	0.28	0.30
Total Phosphorus	mg/L		0.002	0.008	0.004	0.006	0.004	0.005	0.010	0.014	0.018

		SAMPLE DESCRIPTION:		LU	PML-1	PML-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631344	9631345	9631346
Total Kjeldahl Nitrogen	mg/L		0.10	0.38	0.17	0.18
Total Phosphorus	mg/L		0.002	0.021	0.012	0.012

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

Certified By: Original signed

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Certificate of Analysis

AGAT WORK ORDER: 18X398281
PROJECT: 631477

CLIENT NAME: SNC Lavalin Inc.
SAMPLING SITE:

ATTENTION TO: Mike Smith
SAMPLED BY:

Water Analysis - TOC

DATE RECEIVED: 2018-10-17

DATE REPORTED: 2018-11-06

		SAMPLE DESCRIPTION:		KL1	KL2	KL3	KL4	KL5	HWY-102-1	HWY-102-2	LSD
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631332	9631337	9631338	9631339	9631340	9631341	9631342	9631343
Total Organic Carbon	mg/L		1	4	14	4	4	3	7	8	8

		SAMPLE DESCRIPTION:		LU	PML-1	PML-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-10-17	2018-10-17	2018-10-17
Parameter	Unit	G / S	RDL	9631344	9631345	9631346
Total Organic Carbon	mg/L		1	5	4	4

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

Certified By: Original signed

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Quality Assurance

CLIENT NAME: SNC Lavalin Inc.
PROJECT: 631477
SAMPLING SITE:

AGAT WORK ORDER: 18X398281
ATTENTION TO: Mike Smith
SAMPLED BY:

Water Analysis

RPT Date: Nov 06, 2018			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															
Chloride	9631332	9631332	55	56	0.5%	< 1	93%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9631332	9631332	18	19	NA	< 5	105%	80%	120%	NA			NA		
Nitrate as N	9631332	9631332	0.21	0.19	NA	< 0.05	92%	80%	120%	NA	80%	120%	88%	80%	120%
Nitrite as N	9631332	9631332	<0.05	<0.05	NA	< 0.05	99%	80%	120%	NA	80%	120%	92%	80%	120%
Ammonia as N	1	9631099	<0.03	<0.03	NA	< 0.03	87%	80%	120%		80%	120%	85%	80%	120%
Ortho-Phosphate as P	1	9606059	<0.01	<0.01	NA	< 0.01	90%	80%	120%		80%	120%	94%	80%	120%
Total Calcium	9631448		7.0	7.2	2.9%	< 0.1	106%	80%	120%	108%	80%	120%	NA	70%	130%
Total Magnesium	9631448		3.5	3.7	4.2%	< 0.1	108%	80%	120%	104%	80%	120%	NA	80%	120%
Total Phosphorus	2		NA	NA	NA	< 0.002	93%	90%	110%	102%	90%	110%	NA	80%	120%
Total Potassium	9631448		2.3	2.4	6%	< 0.1	95%	80%	120%	98%	80%	120%	NA	70%	130%
Total Sodium	9631448		3.3	3.4	2%	< 0.1	111%	80%	120%	108%	80%	120%	NA	70%	130%
Reactive Silica as SiO2	1	9606059	4.0	3.9	2.5%	< 0.5	100%	80%	120%		80%	120%	83%	80%	120%
Total Suspended Solids	9631332	9631332	<5	<5	NA	< 5	98%	80%	120%	NA			104%	80%	120%
Sulphate	9631332	9631332	9	9	NA	< 2	112%	80%	120%	NA	80%	120%	102%	80%	120%
Turbidity	9631332	9631332	2.1	1.9	11.6%	< 0.1	105%	80%	120%	NA			NA		
Total Copper	9631448		7	7	2.2%	< 1	113%	80%	120%	111%	80%	120%	101%	70%	130%
Total Iron	9631448		58	56	NA	< 50	113%	80%	120%	110%	80%	120%	96%	70%	130%
Total Manganese	9631448		<2	<2	NA	< 2	113%	80%	120%	112%	80%	120%	101%	70%	130%
Total Zinc	9631448		8	8	NA	< 5	100%	80%	120%	99%	80%	120%	101%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
TKN / Low Level TP (Water)															
Total Kjeldahl Nitrogen	9631332	9631332	0.14	0.18	NA	< 0.10	92%	80%	120%	94%	80%	120%	90%	70%	130%
Total Phosphorus	9636464		0.007	0.007	NA	< 0.002	93%	90%	110%	102%	90%	110%	100%	80%	120%
Water Analysis - TOC															
Total Organic Carbon	9631309		<1	<1	NA	< 1	101%	80%	120%	95%	80%	120%	108%	80%	120%
Comments: If he RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Water Analysis - TOC															
Total Organic Carbon	9669305		<1	<1	NA	< 1	104%	80%	120%	110%	80%	120%	117%	80%	120%
Comments: If he RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															

Certified By: Original signed

AGAT Laboratories

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Method Summary

CLIENT NAME: SNC Lavalin Inc.

AGAT WORK ORDER: 18X398281

PROJECT: 631477

ATTENTION TO: Mike Smith

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Total Coliforms (MF)	MIC-121-7002	Sm 9222 H	MF/INCUBATOR
E. Coli (MF)	MIC-121-7002	SM 9222 H	MF/INCUBATOR
Water Analysis			
A kalinity	INOR-121-6001	SM 2320 B	
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
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	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Bicarb. A kalinity (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	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 Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Chlorophyll A - Acidification Method	Subcontracted	Subcontracted	
Total Kjeldahl Nitrogen as N	INOR-121-6020	SM 4500 NORG D	COLORIMETER
Total Kjeldahl Nitrogen	INOR-93-6048	Qu kChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Total Phosphorus	INOR-93-6022	SM 4500-P B & E	SPECTROPHOTOMETER
Total Organic Carbon	INST 0170	SM 5310 B	COMBUSTION

AGAT Laboratories

Unit 122 - 11 Morris Dr.
Dartmouth, Nova Scotia
B3B 1M2
http://webearth.agatlabs.com

Phone: 902-468-8718
Fax: 902-468-8924
www.agatlabs.com

Laboratory use Only
Arrival Condition: ☑ Good ☐ Poor (complete 'notes')
Arrival Temperature: 12.7, 12.8, 13.4
AGAT Job Number: 18X398231
Notes:

Drinking Water Sample (y/n): _____ Reg. No. _____
Waterworks Number: _____

Report To:
Company: SNC Lavalin
Contact: Maria Gutierrez
Address: 5657 Spring Garden Road
Halifax, NS B3J 3R4
Phone: 902-492-4544 FAX:
~~PO#~~: Cell 902-483 4059
AGAT Quotation:
Client Project #: 631477

Invoice to: Same (Y/N) - Circle
Company: SNC Lavalin
Contact: payables@snclavalin.com
Address:
Phone: Fax:
PO#/Credit Card #:

Report Information
1. Name: Maria Gutierrez
Email: Maria.Gutierrez@snclavalin.com
2. Name: Mike Smith
Email: Michael.Smith@snclavalin.com

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do Not List Guidelines on Report
☐ PIRI
Site Info (check all that apply):
☐ Teir 1 ☐ Res. ☐ Pot. ☐ Coarse
☐ Teir 2 ☐ Com ☐ N/Pot. ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☑ CCME ☐ CDWQ
☐ Ind ☐ NSDFOSP
☐ Com ☐ HRM 101
☐ Res/P Storm Water
☐ Ag ☐ HRM 101
☑ FWAL Waste Water
☐ Sediment Health Canada Recreational Water
☑ Other

Report Format
☐ Single PDF sample per page
■ Multiple PDF samples per page
■ Excel Format Included

Turnaround Time (TAT) Business Days
Regular TAT:
■ 5 - 7 days
Rush TAT:
☐ 1 day ☐ 2 days
☐ 3 - 4 days
Date Required:
Time Required:

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	Field Filtered/ Preserved	Standard Water Analysis	Metals (Spring Quarterly Only)	(circle-Total, Diss or Available)	Mercury	TKN	pH	TSS	TP- Low Level 0.002mg/L- Mississauga	Anions	Total Phosphorus	Phenols	TPH/BTEX (PIRI) Teir 1	TPH/BTEX-Fractionation Teir 2	VOC	THM	PAH	Chlorophyll A (Sub to DAL)	E. coli by CFU	Hazardous (Y/N)	Lab Sample #
KL1 Oct 17/18	9:00 AM	water	7			X		T		X		X	X									X	X		
KL2 "	10 AM	water	7			X		T		X		X	X									X	X		
KL3 "	11:30 AM	water	7			X		T		X		X	X									X	X		
KL4 "	11:45 AM	water	7			X		T		X		X	X									X	X		
KL5 "	9:30 AM	water	7			X		T		X		X	X									X	X		
HWY-102-1 "	3:40 PM	water	7			X		T		X		X	X									X	X		
HWY-102-2 "	1:40 PM	water	7			X		T		X		X	X									X	X		
LSD "	10:50 AM	water	7			X		T		X		X	X									X	X		
LU "	12:25	water	7			X		T		X		X	X									X	X		
PML-1 "	2:45 PM	water	7			X		T		X		X	X									X	X		
PML-2 "	2:15 PM	water	7			X		T		X		X	X									X	X		

Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	Special Instructions
Original signed	Oct 17/18 At 4:30 PM	Sam Murphy	4:30pm	
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	SNC Bedford West Package
		Original signed	10/17/18	Page of

Appendix F

Graphs (Seasonal and Historical)

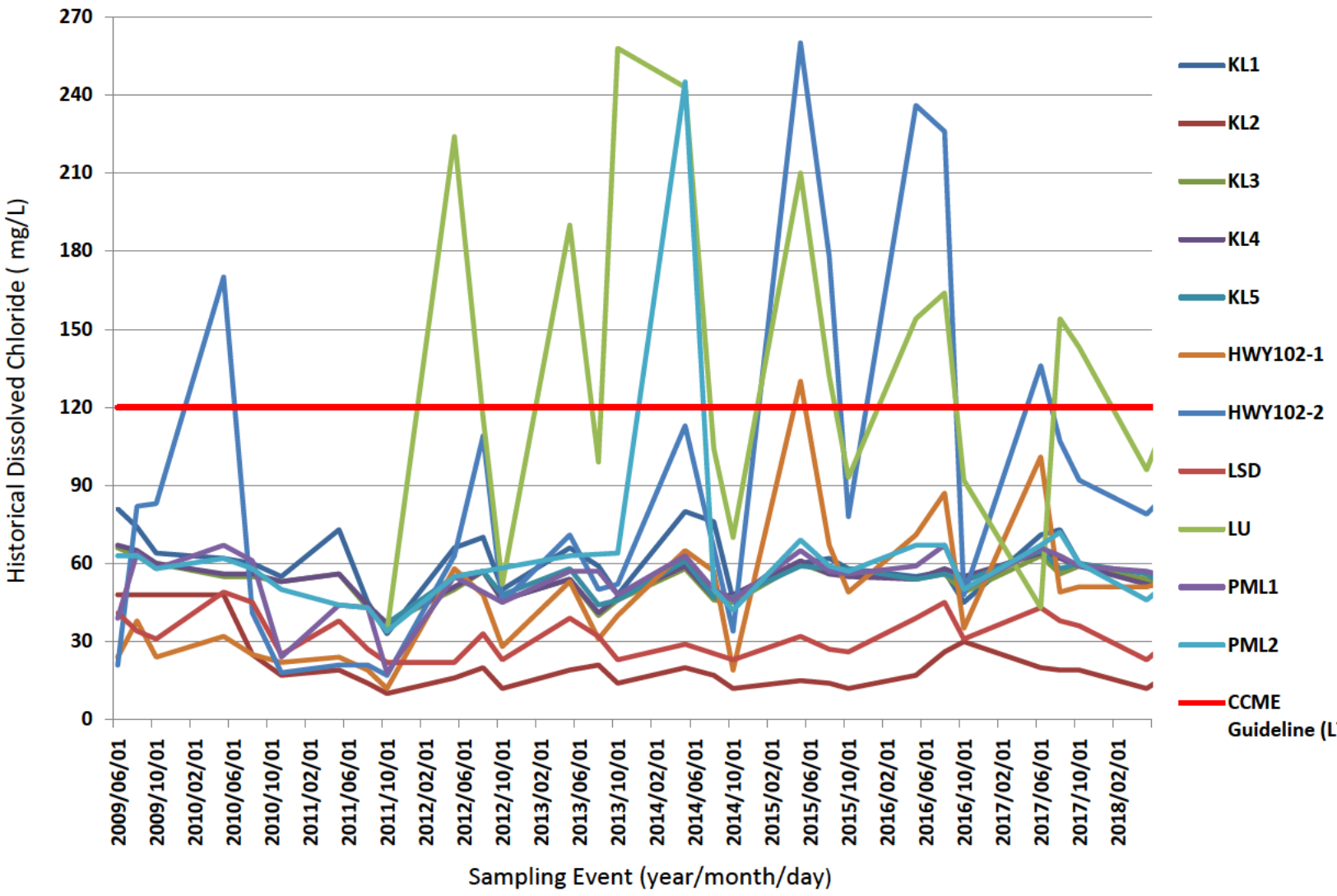

Figure 1 - Historical Dissolved Chloride Concentrations for Water Quality Monitoring Program.

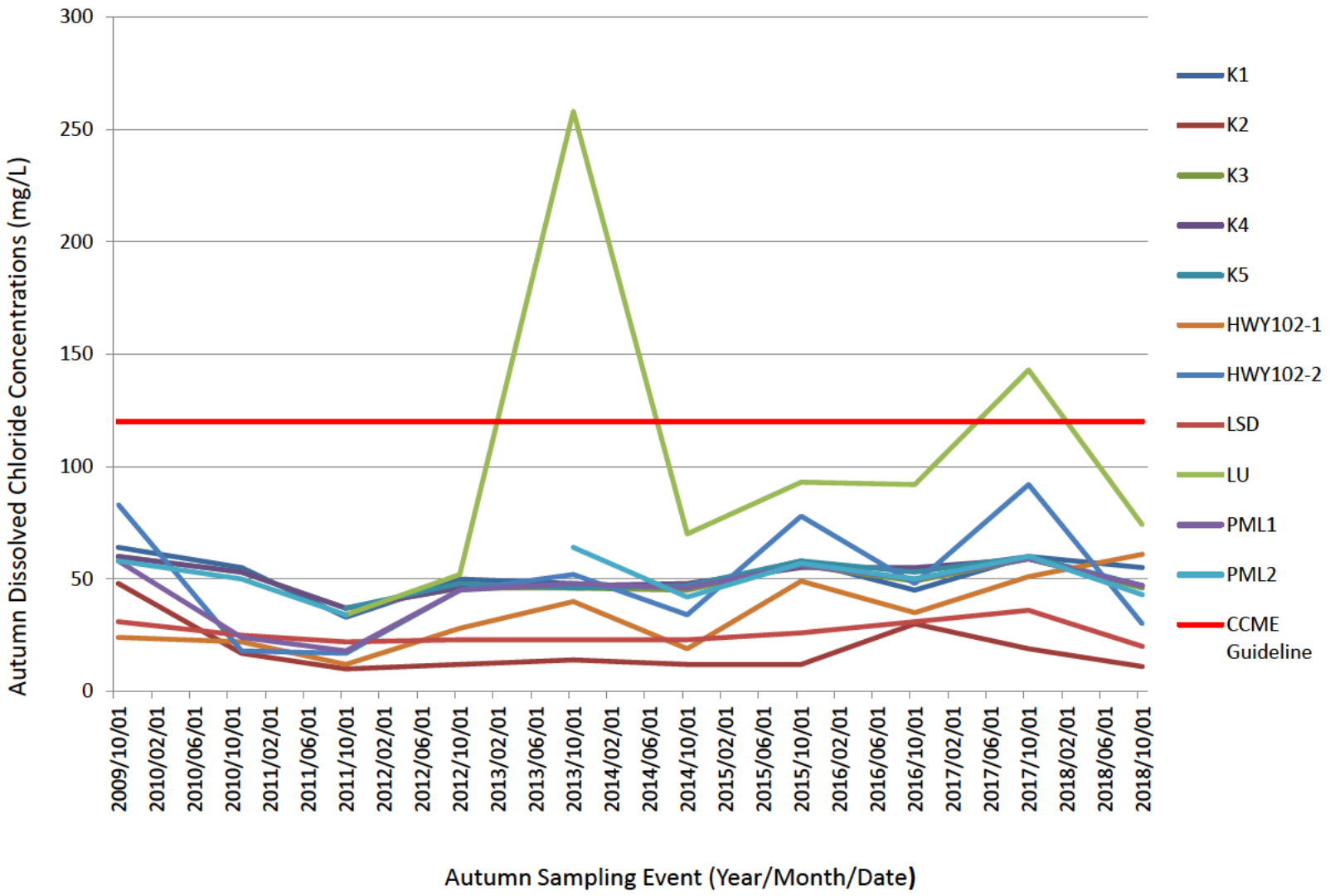

Figure 2 – Seasonal Dissolved Chloride Concentrations for Water Quality Monitoring Program.

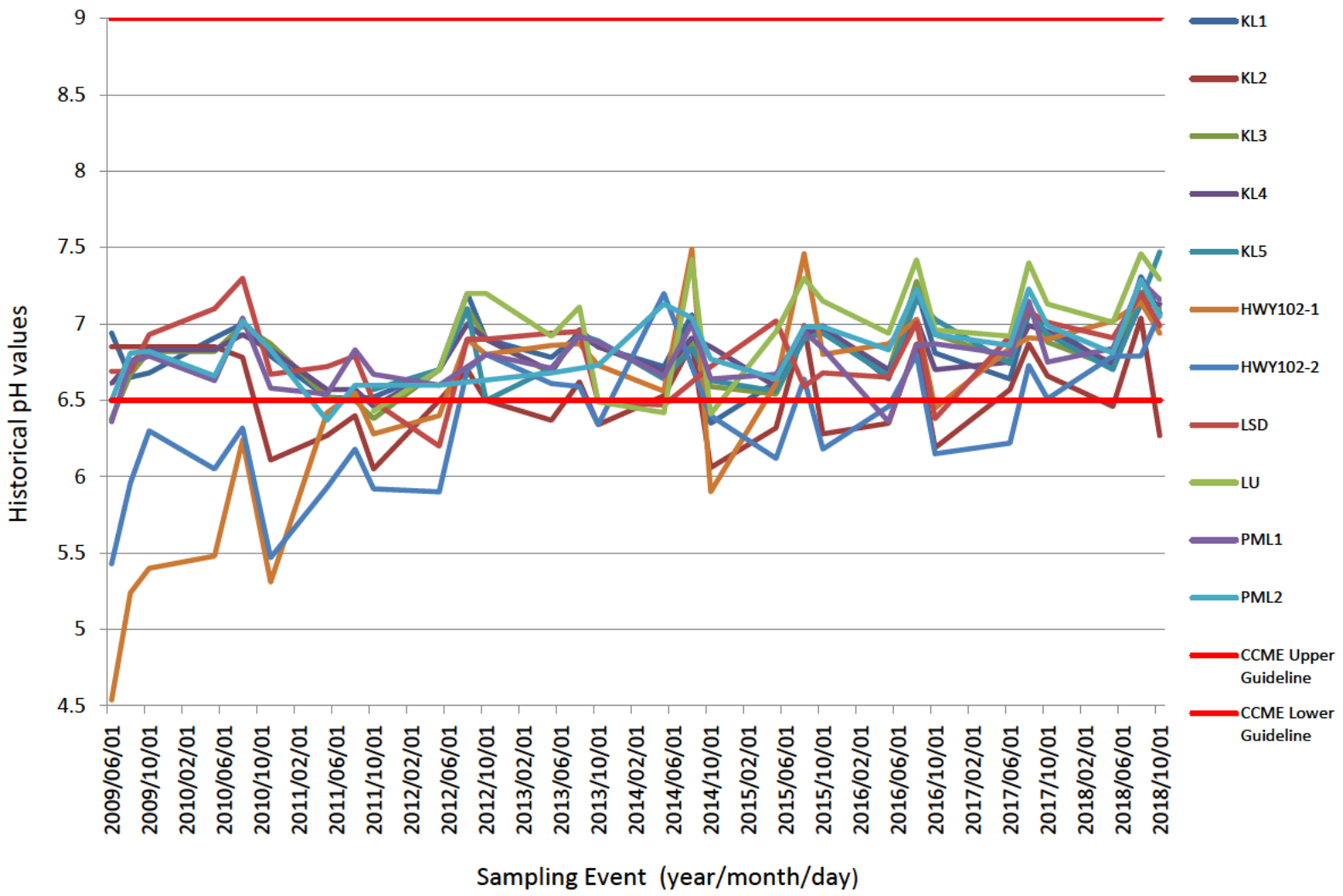

Figure 3 –Historical pH Measurements for Water Quality Monitoring Program

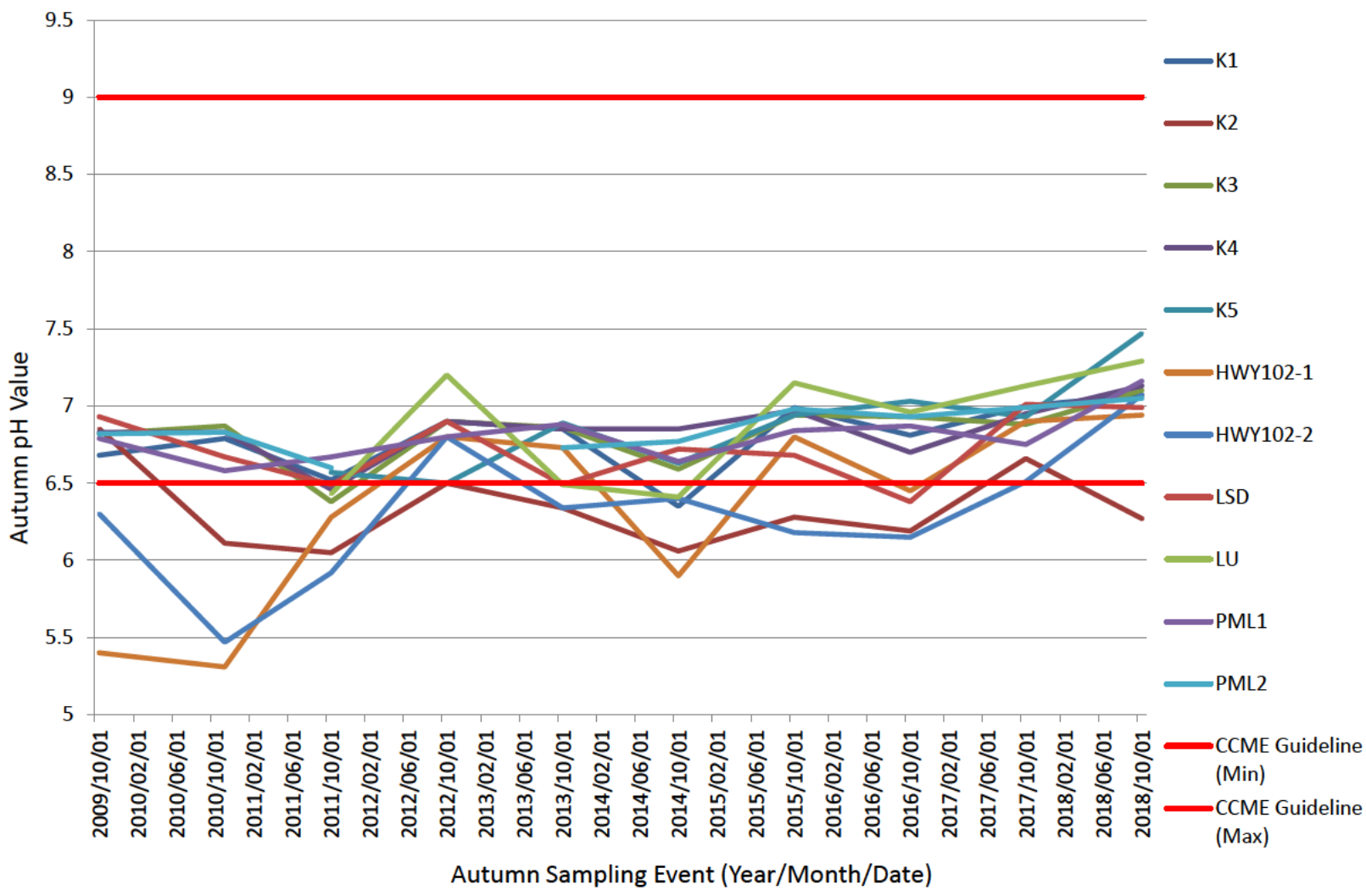

Figure 4 – Seasonal pH Measurements for Water Quality Monitoring Program.

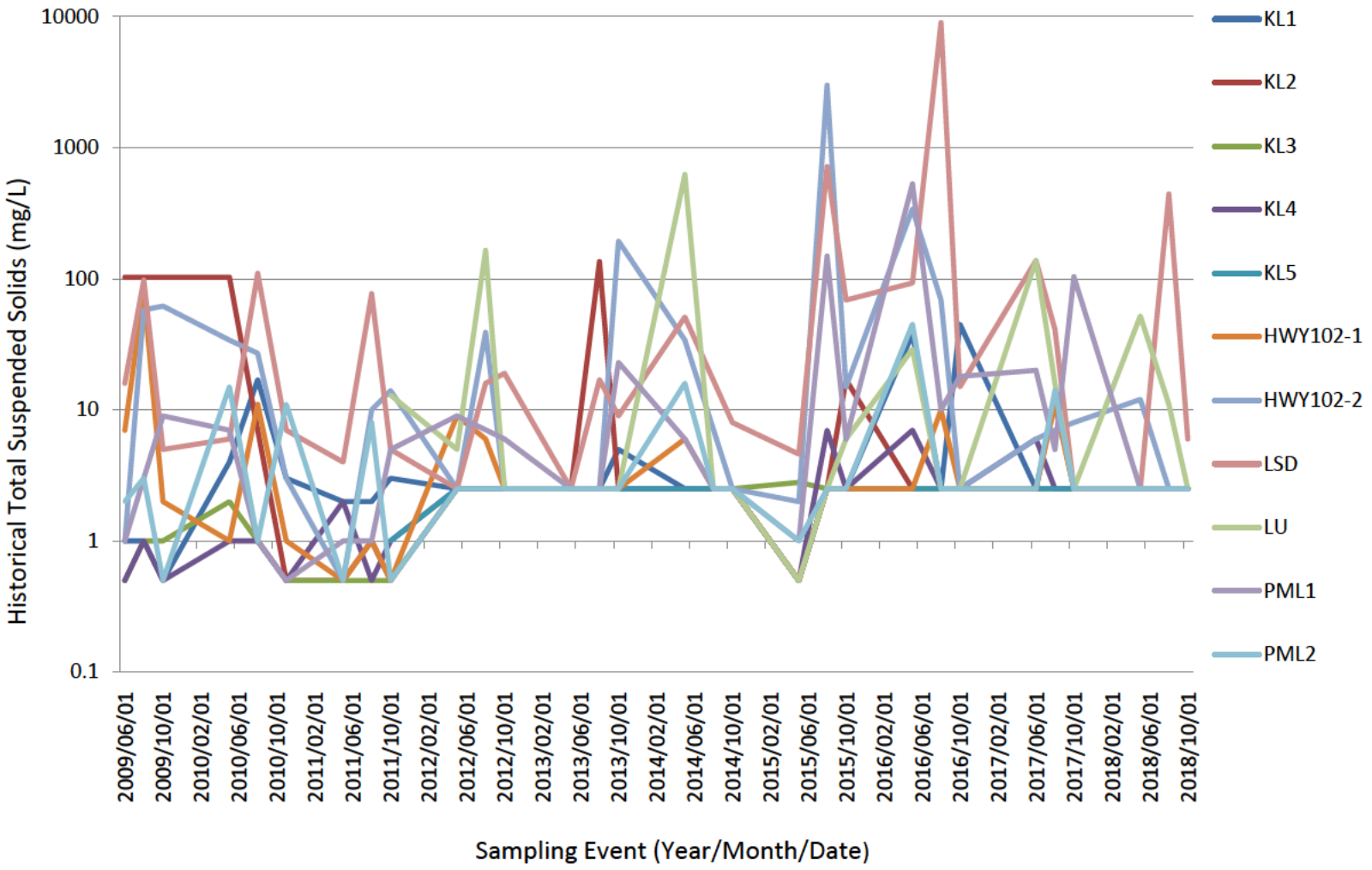

Figure 5 – Historical Total Suspended Solids Concentrations for Water Quality Monitoring Program.

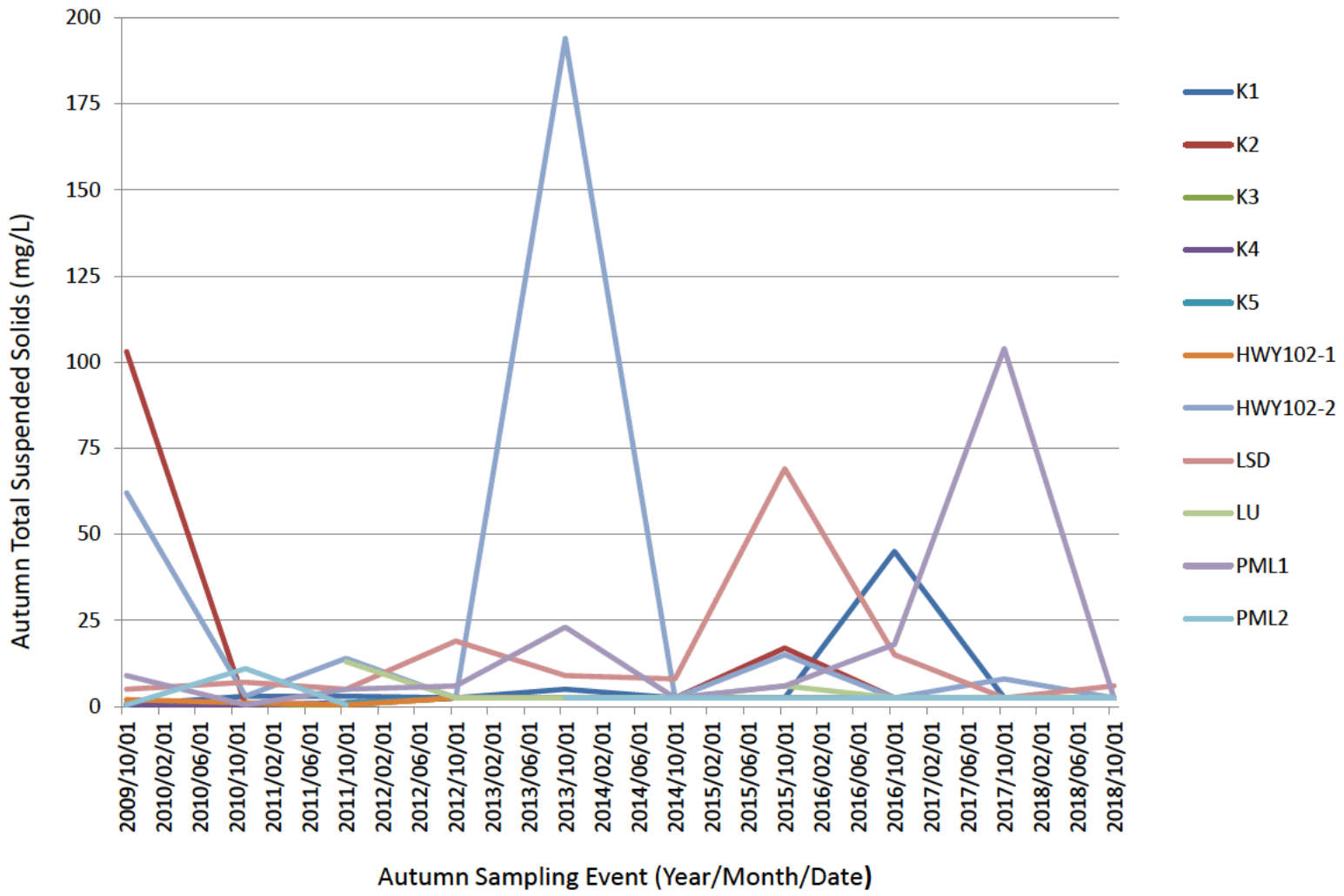

Figure 6 – Seasonal Total Suspended Solids Concentrations for Water Quality Monitoring Program.

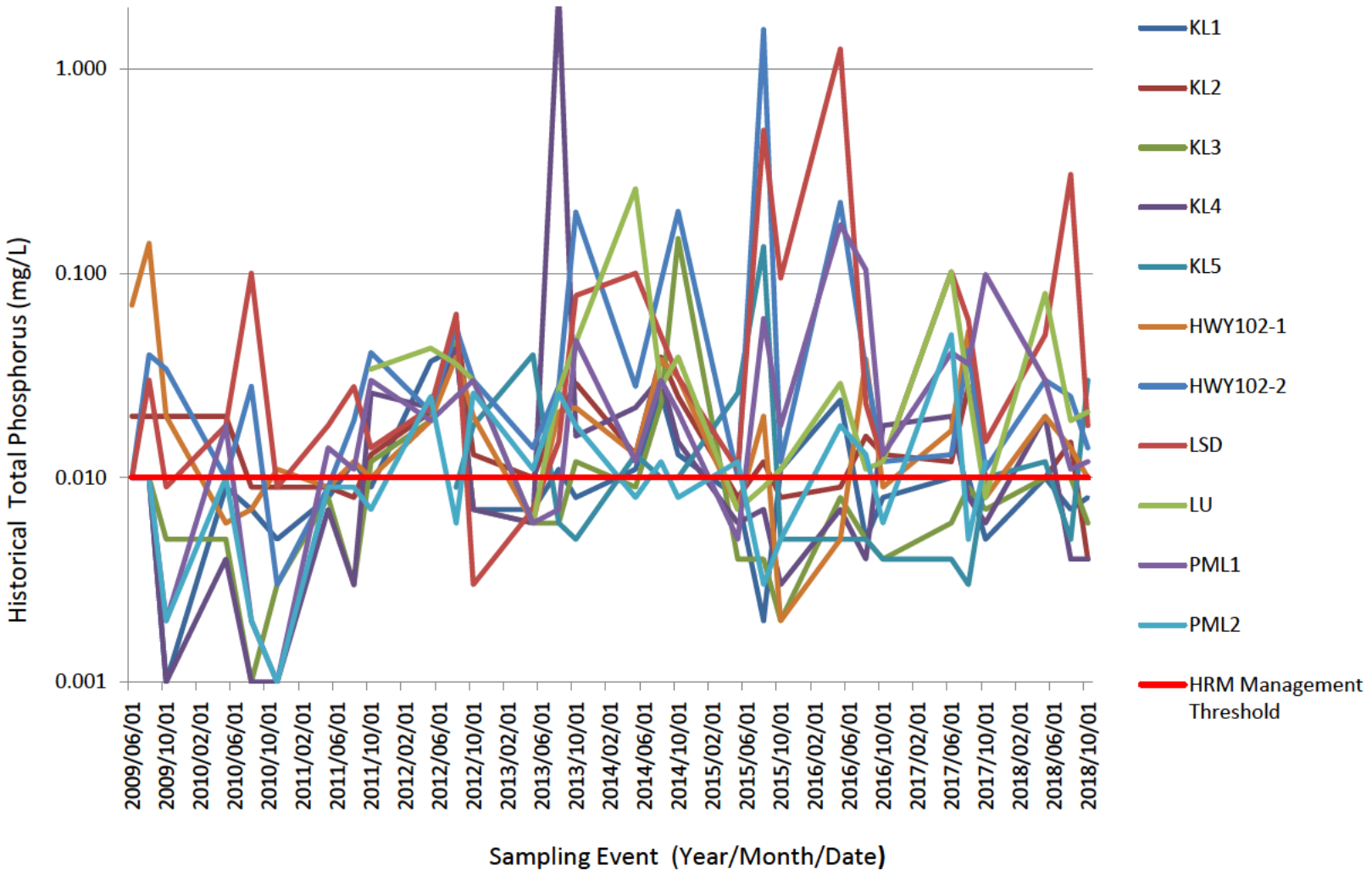

Figure 7 – Historical Total Phosphorus Concentrations for Water Quality Monitoring Program.

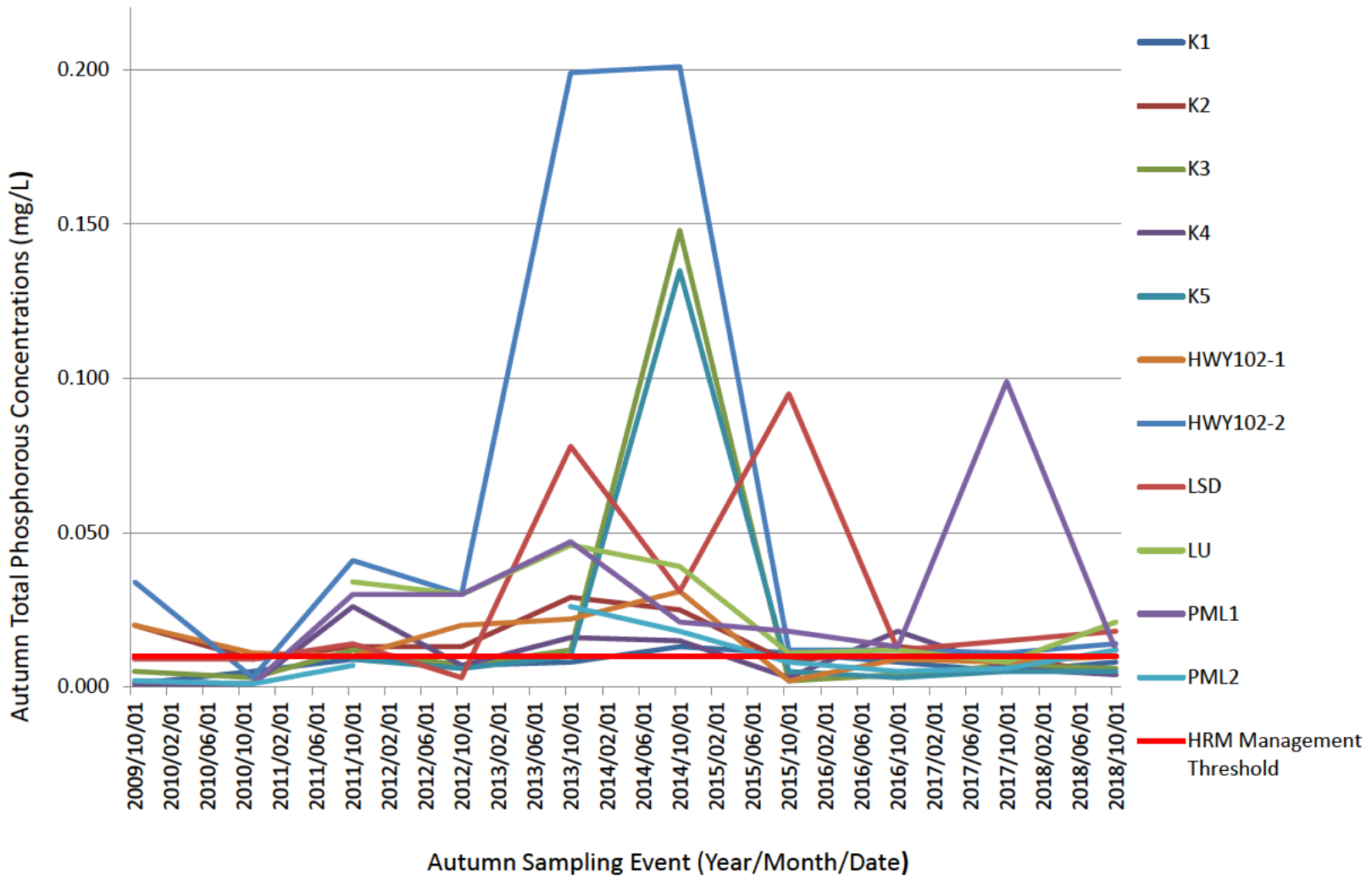

Figure 8 – Seasonal Total Phosphorus Concentrations for Water Quality Monitoring Program.

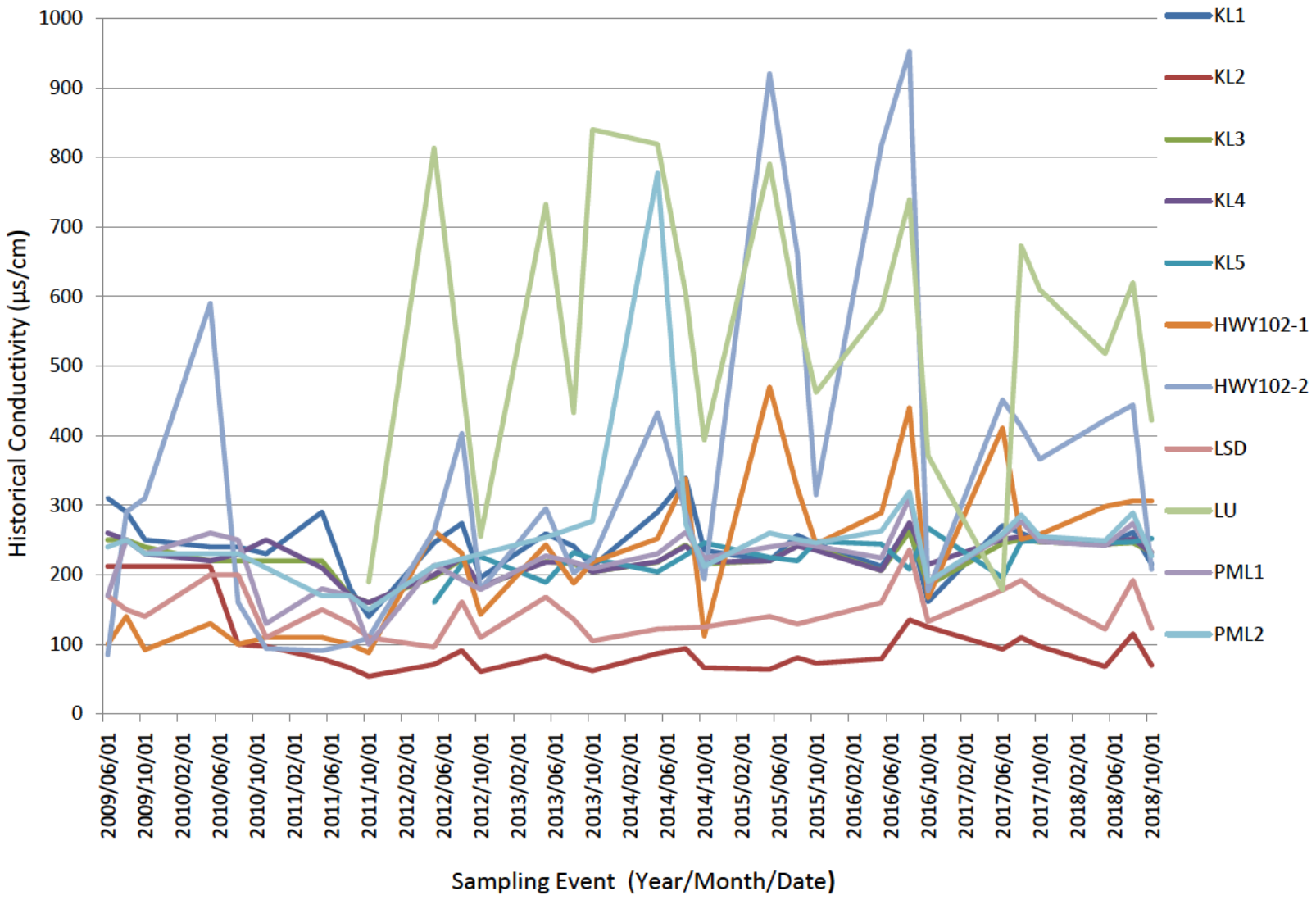

Figure 9 – Historical Measurement of Conductivity for Water Quality Monitoring Program.

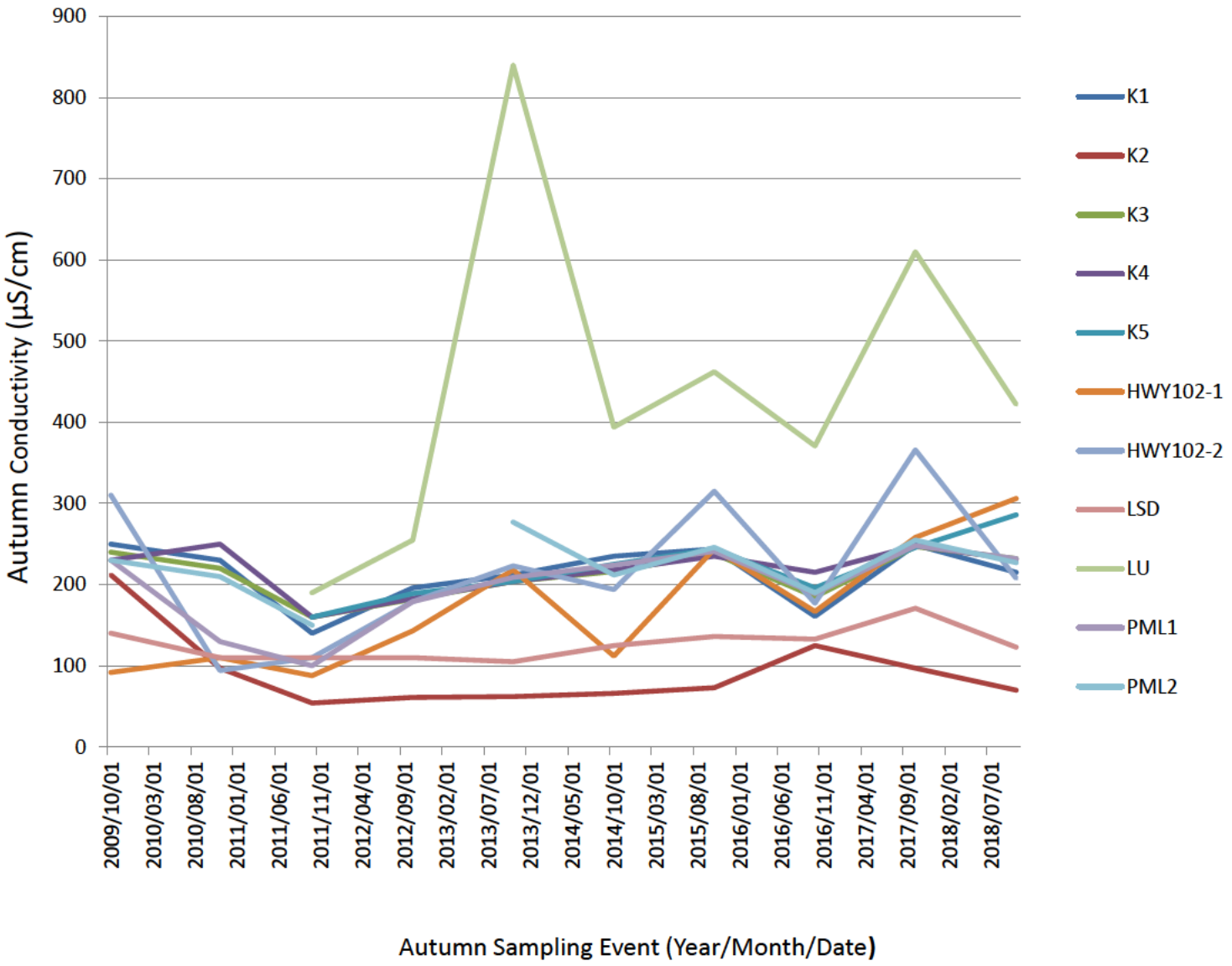

Figure 10 – Seasonal Conductivity Measurements for Water Quality Monitoring Program.

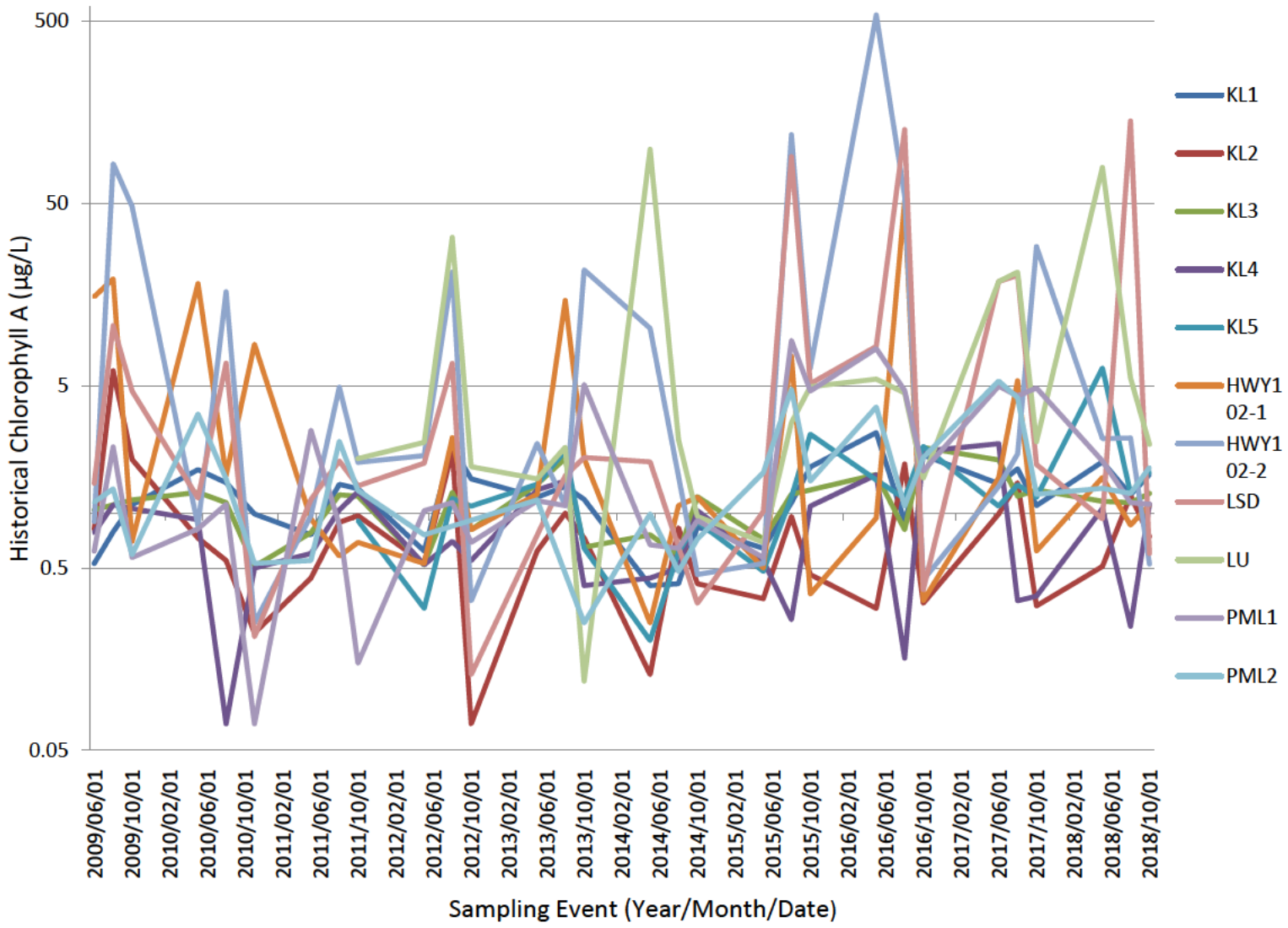

Figure 11 – Historical Chlorophyll A Concentrations for Water Quality Monitoring Program.

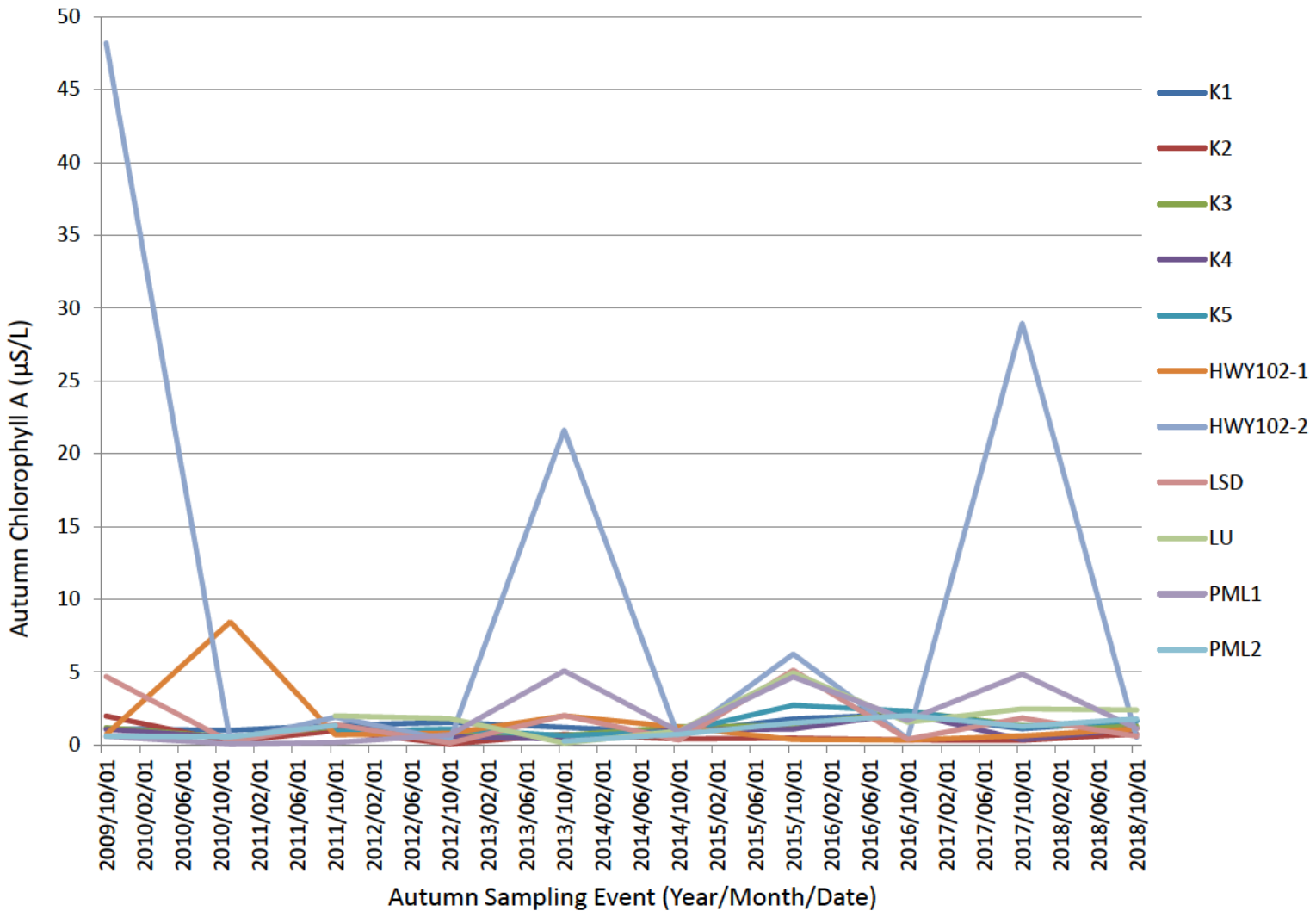

Figure 12 – Seasonal Chlorophyll A Concentrations for Water Quality Monitoring Program.

SNC·LAVALIN

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