

# 2022-2023 Monitoring and Maintenance Program

Come By Chance Hazardous Waste Landfill Site -  
Main Road, Come By Chance, NL

Government of Newfoundland and Labrador-  
Department of Environment and Climate Change  
Final Report

May 1, 2023  
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**ENGLOBE**

# Government of Newfoundland and Labrador- Department of Environment and Climate Change

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# Executive Summary

The 2022-2023 Monitoring and Maintenance Program has been conducted by Englobe Corp. (Englobe) at the property identified as the Come By Chance Hazardous Waste Landfill located near the intersection of Main Road and Refinery Road in Come By Chance, Newfoundland and Labrador (NL) (herein referred to as 'the site'). The purpose of the work was to conduct one groundwater and surface water sampling event at the site, conduct inspection of the groundwater monitor wells, groundwater drainage system and the landfill cover, to carry out maintenance activities such as vegetation control, if required, as well as to conduct leachate sampling and pumping of the leachate collection system.

The field component of the monitoring program was conducted on multiple visits between December 21, 2022, and April 6, 2023, and included groundwater, surface and leachate sampling, site inspections and leachate collection system pumping and disposal.

Analytical results for petroleum hydrocarbons (PHCs), metals (total and dissolved), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) and general chemistry parameters identified in samples collected from groundwater and surface water were compared to the 2021 Atlantic RBCA Version 4 Ecological Tier I Environmental Quality Standards (EQSs) for a commercial property with coarse-grained soil and a non-potable groundwater supply.

Analytical results for PHC, PAHs, VOCs, PCBs, general chemistry parameters and acute lethality identified in samples collected from the leachate collection chambers were compared to the 2021 Atlantic RBCA Version 4 Ecological Tier I EQS and the Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

The results of the 2022/2023 Maintenance and Monitoring Program are summarized as follows:

- Six existing monitor wells were located and sampled including MW93-1, MW93-1A, MW93-2, MW-932A, MW10-1 and MW10-1A, two surface water locations were sampled including SURF-UP and SURF-DOWN and two leachate samples were collected from each of the liner collection systems (PLCS and SLCS);
- The depths to groundwater in the monitor wells ranged from 0.99 mbgs in monitor well MW10-01 to 3.01 mbgs in MW93-1A on December 21, 2022 and January 4, 2023;
- Measurable free liquid phase petroleum hydrocarbons were not observed in groundwater in any of the monitor wells during the 2022/2023 maintenance and monitoring program;
- Concentrations of petroleum hydrocarbons, PAHs, VOCs and PCBs in groundwater samples collected from monitor wells MW93-1, MW93-1A, MW93-2, MW-932A, MW10-1 and MW10-1A satisfied the applicable Ecological Health Tier I EQSs;
- Concentrations of aluminum, cadmium, iron, manganese, molybdenum, silicon and zinc in some or all of the groundwater monitor wells exceeded the applicable Ecological Health Tier I EQSs. All other metal parameters satisfy applicable Ecological Health Tier I EQS;
- Concentrations of ammonia as N exceeded the applicable Ecological Health Tier I EQSs in 4 of the 6 groundwater samples collected the on-site monitor wells;
- Concentrations of petroleum hydrocarbons, PAHs, VOCs and PCBs in surface water samples collected from the unnamed brook located southeast of the landfill satisfied the applicable Ecological Health RBCA Tier I EQSs;

- Concentrations of aluminum and iron in surface water samples collected from the unnamed brook located southeast of the landfill exceeded the applicable Ecological Health RBCA Tier I EQSs. All other metal parameters satisfy applicable Ecological Health Tier I EQS;
- pH in one of the surface water samples (i.e., SURF-DOWN) collected from the unnamed brook located to the southeast of the landfill was reported to be outside of the acceptable range for pH as per the Ecological Health Tier I EQS;
- Concentrations of dissolved and total iron in one of the leachate samples (i.e., SLCS) collected from the liner containment chambers was reported to exceed the NL Regulation 65/03, ECWSR (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water). Based on this reported exceedance Englobe recommended pumping of the leachate for offsite disposal;
- Between April 5 and 6, 2023, 50,000 L of leachate was pumped from the PLCS and the SLCS containment chambers by Pardy’s Waste Management under the supervision of Englobe personnel;
- An inspection of the groundwater drainage system clean outs indicated that only three of the four clean-outs were located (i.e., CO1 to CO3). Where located, the clean-outs appear to be in good condition; and,
- Englobe could not access the adjacent property to inspect the outfall as it is a fenced private property; however, based on a visual assessment of the general area from the outside of the fenced area, the outfall could not be located.

Based on the available environmental data, no unacceptable risks to ecological receptors are anticipated at the site under current site conditions.

However, some considerations with respect to future operations of the site are outlined below:

- Continue to conduct annual groundwater, surface water and leachate monitoring and sampling in 2023/2024 to confirm groundwater, surface water and leachate quality at the site and down-gradient of the site. Conduct a trend analysis of the historical data including the additional monitoring;
- Complete a full assessment of the groundwater drainage system to determine if the system is still functioning as designed with emphasis on locating CO4 and the outfall on the adjacent property; and,
- Consideration should be given to placement of GW monitor wells downgradient of the landfill to aid in monitoring the conditions of the offsite groundwater conditions downgradient from the landfill.

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# 1 Introduction

The 2022-2023 Monitoring and Maintenance Program has been conducted by Englobe Corp. (Englobe) at the property identified as the Come By Chance Hazardous Waste Landfill located near the intersection of Main Road and Refinery Road in Come By Chance, Newfoundland and Labrador (NL) (herein referred to as the 'site'). The purpose of the work was to conduct one groundwater and surface water sampling event at the site, conduct inspection of the groundwater monitor wells, groundwater drainage system and the landfill cover, to carry out maintenance activities such as vegetation control, if required, as well as to conduct leachate sampling and pumping of the leachate collection system.

## 2 Background

### 2.1 Subject Property Description

The site is located near the intersection of Refinery Road and Main Road, approximately 2.5 km west of the Trans-Canada Highway and approximately 4 km south of the Town of Come By Chance, NL. The site has an approximate area of 2.0 hectares and is located in an industrial zoned property within the municipality of Come By Chance. A general Site Location Map, Figure 2.1, indicates the site's approximate extent for this investigation.

Figure 2-1 - Site Location Map - Intersection of Refinery Road and Main Road, Come By Chance, NL



Image source: Land Use Atlas, 2022.

Based on the information provided within the request for proposals (RFP) the landfill was constructed between 1994 and 1996 to facilitate the clean-up of hazardous waste associated with the original operators of the Come By Chance Oil Refinery and is filled with industrial waste and contaminated soil. The landfill was capped by the end of 1996.

From the review of previous site reports Englobe understands that four monitor wells were installed around the perimeter of the site (MW93-2, MW93-2A, MW10-1 and MW10-1A) to monitor potential leachate impacts in groundwater and two monitor wells (MW93-1 and MW93-1A) were installed upgradient of the site to monitor background analyte concentrations. Leachate containment is achieved through the use of a liner system consisting of independent primary and secondary liner collection systems (PLCS and SLCS, respectively) as well as a groundwater drainage system (GWDS) to manage excess fluid and provide a means for leachate discharge.

Indications that the landfill cap and primary liner appeared to be minimizing the infiltration of precipitation into the landfill were reported during monitoring events conducted between 2004 and 2007.

However, a historical monitoring report, noted that large volumes of leachate identified in the SLCS is an indication that groundwater may be entering the SLCS via perforations in the liner. The report further noted that the groundwater levels identified north of the landfill appear to be higher than the base of the SLCS at various times throughout the year. As a result, in 2009, a GWDS, consisting of a french drain was installed along the north and east sides of the landfill which was connected to a storm drain located along the east side of the landfill.

Surface water sampling was intended to characterize leachate from the site's leachate containment system and assess potential leachate infiltration into the nearby surface water by sampling a stream directly downgradient. Background analyte concentrations of the surface water was established by sampling at an upgradient location, which is located southeast of the landfill fenced area.

## 2.2 Geology, Hydrology and Hydrogeology

The following information has been obtained from available provincial mapping:

**Surficial deposits:** Based on our review of publicly available surficial geological maps and our previous experience from other investigations near this site, the site's surficial geology comprises of a mix of thick fluvial deposits of silt, clay to boulder and thin placed till deposits.

**Bedrock:** Based on publicly available bedrock mapping of the area (A.F. King, 1988), bedrock at the site is mapped as consisting of sandstone and shale turbidites of the Connecting Point Group and Conception Group.

**Hydrogeology:** Groundwater flow in the area is expected to vary, but to be generally to the west / northwest in the direction of Placentia Bay located approximately 270 m from the western boundary line of the site.

## 2.3 Previous Environmental Reports

Ten previous environmental reports prepared for the subject property were provided by ECC within the RFP and reviewed as part of the assessment.

- *Come By Chance Secure Landfill Groundwater Drainage System.* Prepared by AMEC Earth and Environmental, dated March 2009 (AMEC Reference No. TF8112721);
- *Annual Summary Report. 2010/2011 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CRA, dated March 2011 (Ref. No. 056680 (3));

- *2011/2012 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CBCL Limited, dated June 21, 2012 (Ref. No. 113080.00);
- *Come By Chance Secure Landfill, Operation, Maintenance and Monitoring (OMM) Manual,* dated June 2012;
- *2012/2013 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CRA, dated May 2013 (Ref. No. 056680 (6));
- *2013/2014 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CRA, dated November 2013 (Ref. No. 084308 (3));
- *2014/2015 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CRA, dated February 2015 (Ref. No. 084308 (6));
- *2015/2016 Monitoring and Maintenance Program Come By Chance Secure Landfill, Come By Chance, NL.* Prepared by Fracflow Consultants Inc., dated May 2016 (FFC File 3073C);
- *2017/2018 Monitoring Program Come By Chance Secure Landfill, Come By Chance, Newfoundland and Labrador.* Prepared by CRA, dated June 2018 (084308 / Report No 9);
- *2021/2022 Monitoring and Maintenance Program Come By Chance Hazardous Waste Landfill, Come By Chance, NL.* Prepared by Strum Consulting, dated March 31, 2022 (Project # 21-8635); and,
- *Come By Chance Secure Landfill, Operations, Maintenance and Monitoring (OMM) Manual.* Prepared for Newfoundland and Labrador Department of Environment and Climate Change Pollution Prevention Division, dated March 2022.

## 3 Scope of Work

The scope of work for the Monitoring and Maintenance Program is as follows:

- Sampling and analysis (modified total petroleum hydrocarbons (TPH)/benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), general chemistry, volatile organic compounds (VOCs), and dissolved metals (including mercury)) of groundwater from six existing monitor wells;
- Sampling and analysis (TPH/BTEX, PAHs, PCBs, general chemistry, VOCs, and total metals (including mercury, trivalent and hexavalent chromium (Cr<sup>3+</sup> and Cr<sup>6+</sup>)) of two surface water locations (SURFACE-UP and SURFACE-DOWN);
- Sampling and analysis (TPH/BTEX, PAHs, PCBs, general chemistry, VOCs, dissolved and total metals (including mercury)), toxicity (rainbow trout) as well as phenols, cyanide, sulfides and any other parameters as required to ensure compliance with Schedule A of the Environmental Control Water and Sewage Regulations of two leachate samples (PLCS and SLCS);
- If the leachate complies with the criteria, results shall be reviewed by NLECC for approval to discharge to the drainage ditch downgradient of the landfill. If the leachate does not comply and exceeds the background levels (i.e., surface water location SURFACE-UP and monitor well MW93-1A), then the leachate shall not be disposed directly into a water body. The leachate may be collected and disposed of by an approved liquid waste management company;
- Inspection of the landfill cover, elevation control, and groundwater drainage system;
- An analysis of analytical data and discussion of groundwater to determine future monitoring requirements including assessment of the requirement for additional monitor wells;

- Complete a comprehensive review on the overall integrity of the double liner system of the landfill, the current groundwater monitoring plan and provide a path forward on how to address the outstanding, long-term maintenance issues of the site, such as the valves being stuck in the open position; and,
- Conduct vegetation control as specified in the Come By Chance Secure Landfill Operations, Maintenance and Monitoring (OMM) Manual.

## 4 Approach & Methodology

### 4.1 Groundwater Sampling

Englobe personnel were on-site on December 21, 2022 and January 4, 2023, to collect groundwater samples from six monitoring wells, including MW10-01, MW10-01A, MW93-1, MW93-1A, MW93-2 and MW93-2A. Prior to sampling, static groundwater levels were measured at each monitoring well using a Solinst interface probe and were verified for the presence of free phase petroleum product. Each well was developed by purging a minimum of three well casing volumes using dedicated bailers. After allowing sufficient time for groundwater recovery, groundwater samples were collected from the monitor wells using dedicated bailers and placed in laboratory supplied bottles and vials (with preservative as necessary).

Samples were then placed in a secure ice-packed cooler until delivery to the laboratory. Groundwater samples were submitted to ALS Laboratories in Dartmouth, NS for analysis of petroleum hydrocarbons (PHCs), metals (dissolved), PAHs, VOCs, PCBs and general chemistry. ALS is certified by the Standards Council of Canada (SCC). Where applicable, analyses were performed in accordance with the protocols stipulated in the Atlantic RBCA Guidelines for Laboratories, Version 3.1, May 2016.

One field duplicate sample at monitor well MW10-01 was also collected and submitted for PHCs, metals (dissolved), PAHs, VOCs, PCBs and general chemistry.

Information from the groundwater sampling program is presented in Tables 1 to 6. The locations of all monitor wells are shown on Figure 1 of Appendix A.

## 5 Assessment Standards

The site is occupied by a hazardous waste landfill and is identified on the Newfoundland and Labrador land use map as an industrial property. Site soils are coarse-grained and groundwater resources are not used as a potable water source and therefore considered to be non-potable.

Analytical PHC, PAH, VOC, PCB, general chemistry parameters and metal results in groundwater have been compared to:

- 2021 Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for a commercial property with non-potable groundwater and coarse-grained soil; and,
- 2021 Atlantic RBCA Ecological Tier I EQSs for groundwater based on a >10 m distance from a surface water body with discharge to a fresh water and/or marine water body.

Analytical PHC, PAH, VOC, PCB, general chemistry parameters and metal results in surface water have been compared to:

- 2021 Atlantic RBCA Ecological Tier I EQSs for Surface Water with discharge to fresh water and/or marine water.

Analytical PHC, PAH, VOC, PCB, general chemistry parameters, metal and lethality results in leachate have been compared to:

- Newfoundland and Labrador (NL) Regulation 65/03, Environmental Control Water and Sewage Regulations (ECWSR) (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water); and,
- 2021 Atlantic RBCA Human Health-Based Tier I EQSs for Surface Water with discharge to fresh water and/or marine water.

# 6 Results

## 6.1 Hydrogeologic Assessment

On, December 21, 2022 and January 4, 2023, Englobe personnel measured the groundwater depth in all monitoring wells located at the site. Table 6-1 presents the results of the groundwater survey. The groundwater depths ranged from 0.245 to 1.739 mbgs. Based on topography the groundwater flow direction is expected to be to the east/southeast.

**Table 6-1- Summary of Groundwater Depths and Elevations**

Location	Depth to Groundwater from Top of Casing (mbTOC)	Stick Up	Depth to Groundwater (mbgs)	Top of Casing Elevation (m)	Ground Surface Elevation (m)	Groundwater Elevation (m)
MW10-01	2.585	0.846	1.739	16.836	15.946	14.207
MW10-01A	2.586	0.854	1.732	16.884	15.959	14.227
MW93-1	1.760	1.100	0.66	17.78	16.427	15.767
MW93-1A	2.025	1.400	0.625	17.459	16.312	15.687
MW93-2	1.345	1.100	0.245	15.409	14.005	13.76
MW93-2A	1.685	1.100	0.585	14.156	14.156	13.571

## 6.2 Samples Submitted

In total ten water samples including six groundwater plus one field duplicate, two surface water samples and two leachate samples were submitted for chemical analysis.

**Details of the analysis performed on each sample can be found in**

Table 6-2. The locations of the wells and surface water sample locations are shown on Figure 1, Appendix A.



**Table 6-2 - Summary of Samples Submitted**

Sample ID	Location(s)	Analysis
MW10-01	MW10-01	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW10-01A	MW10-01A	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW10-01(DUP)	MW10-01	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW93-1	MW93-1	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW93-1A	MW93-1A	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW93-2	MW93-2	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
MW93-2A	MW93-2A	PHCs, Metals (dissolved), PAHs, PCBs, VOCs, and General Chemistry.
SURF-UP	Upstream Surface Water Body	PHCs, Metals (total), PAHs, PCBs, VOCs, and General Chemistry.
SURF-DOWN	Downstream Surface Water Body	PHCs, Metals (total), PAHs, PCBs, VOCs, and General Chemistry.
	PLCS Catchment	PHCs, Metals (dissolved/total), PAHs, PCBs, VOCs, General Chemistry and Lethality.
	SLCS Catchment	PHCs, Metals (dissolved/total), PAHs, PCBs, VOCs, General Chemistry and Lethality.

Laboratory analytical results are included in Tables 1 to 20 of Appendix C and discussed below. The laboratory certificates are included in Appendix D.

## 6.3 Analytical Results

Laboratory analytical results obtained during the 2022/2023 Maintenance and Monitoring Program are presented in Tables 1 to 20 in Appendix C. Groundwater, surface water and leachate results are presented in conjunction with the applicable Atlantic RBCA Human Health-Based or Ecological Tier I EQSs and the NL Regulation 65/03, ECWSRs (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water). Copies of the laboratory certificates of analysis are provided in Appendix D.

### 6.3.1 Groundwater

#### 6.3.1.1 Petroleum Hydrocarbons

Six groundwater samples plus one field duplicate sample were submitted for PHC analysis. Laboratory analytical results are included in Table 1 of Appendix C. The laboratory certificates are included in Appendix D.

All of the groundwater samples submitted plus the field duplicate reported PHC concentrations below the laboratory detection limits.

#### 6.3.1.2 Metals (dissolved)

Six groundwater samples plus one field duplicate sample were submitted for metals (dissolved) analysis. Laboratory analytical results are included in Table 2 of Appendix C. The laboratory certificates are included in Appendix D.

The following exceedances were noted:

- Aluminum in monitor well MW93-2;
- Cadmium in monitor well MW93-2;
- Iron in monitor well MW10-01;
- Manganese in monitor well MW93-2;
- Molybdenum in monitor wells MW10-01, MW10-01a, MW93-1, MW93-1A, and M93-2a;
- Silicon in monitor wells MW10-01, MW10-01A, MW93-1, MW93-1A, MW93-2 and MW93-2A; and,
- Zinc in monitor well MW93-2.

All other metal parameters satisfy applicable 2021 Ecological Based Tier I EQSs.

#### 6.3.1.3 PAHs

Six groundwater samples plus one field duplicate sample were submitted for PAH analysis. Laboratory analytical results are included in Table 3 of Appendix C. The laboratory certificates are included in Appendix D.

The PAH parameters reported ranged from below detectable limits to trace levels, thus, satisfying the applicable Human Health-Based and Ecological Tier I EQSs.

#### 6.3.1.4 VOCs

Six groundwater samples plus one field duplicate sample were submitted for VOC analysis. Laboratory analytical results are included in Table 4 of Appendix C. The laboratory certificates are included in Appendix D.



The VOC parameters reported ranged from below detectable limits to trace levels, thus, satisfying the applicable Human Health-Based and Ecological Tier I EQSs.

#### **6.3.1.5 PCBs**

Six groundwater samples plus one field duplicate sample were submitted for PCB analysis. Laboratory analytical results are included in Table 5 of Appendix C. The laboratory certificates are included in Appendix D.

The PCB parameters reported were below detectable limits, however, the applicable Ecological Tier I EQS for discharge to fresh water guideline (0.01 µg/L) is lower than the RDL (0.06 µg/L).

#### **6.3.1.6 General Chemistry**

Six groundwater samples plus one field duplicate sample were submitted for general chemistry analysis. Laboratory analytical results are included in Table 6 of Appendix C. The laboratory certificates are included in Appendix D.

The general chemistry parameters reported ranged from below detectable limits to trace levels, thus, satisfying the applicable Ecological Tier I EQSs with the exception of ammonia as N which exceeded the applicable Ecological Tier I EQSs in four of the six groundwater samples collected from the on-site monitor wells.

### **6.3.2 Surface Water**

#### **6.3.2.1 Petroleum Hydrocarbons**

Two surface water samples plus one field duplicate were submitted for PHC analysis. Laboratory analytical results are included in Table 7 of Appendix C. The laboratory certificates are included in Appendix D.

All of the surface water samples submitted reported PHC concentrations below the laboratory detection limits.

#### **6.3.2.2 Metals (total)**

Six groundwater samples plus one field duplicate sample were submitted for metals (total) analysis. Laboratory analytical results are included in Table 3 of Appendix C. The laboratory certificates are included in Appendix D.

- Aluminum in surface water samples SURF-UP and SURF-DOWN plus the field duplicate; and,
- Iron in surface water samples SURF-UP and SURF-DOWN plus the field duplicate.

All other metal parameters satisfy applicable Ecological Based Tier I EQS for surface water.

#### **6.3.2.3 PAHs**

Two surface water samples plus one field duplicate were submitted for PAH analysis. Laboratory analytical results are included in Table 9 of Appendix C. The laboratory certificates are included in Appendix D.

The PAH parameters reported ranged from below detectable limits, thus, satisfying the applicable Ecological Tier I EQSs.

#### **6.3.2.4 VOCs**

Two surface water samples plus one field duplicate were submitted for VOC analysis. Laboratory analytical results are included in Table 10 of Appendix C. The laboratory certificates are included in Appendix D.

The VOC parameters reported ranged from below detectable limits, thus, satisfying the applicable Ecological Tier I EQSs.

#### **6.3.2.5 PCBs**

Two surface water samples plus one field duplicate were submitted for PCB analysis. Laboratory analytical results are included in Table 11 of Appendix C. The laboratory certificates are included in Appendix D.

The PCB parameters reported below detectable limits, however, the applicable Ecological Tier I EQS for discharge to fresh water guideline (0.001 µg/L) is lower than the RDL (0.06 µg/L).

#### **6.3.2.6 General Chemistry**

Two surface water samples plus one field duplicate were submitted for general chemistry analysis. Laboratory analytical results are included in Table 12 of Appendix C. The laboratory certificates are included in Appendix D.

The general chemistry parameters reported ranged from below detectable limits to trace levels, however, satisfying the applicable Ecological Tier I EQSs.

A sample collected from the downstream location (identified as SURF-DOWN) reported a pH concentration of 6.49 which is considered outside of the acceptable range identified in the Ecological Tier I EQS guideline.

### **6.3.3 Leachate**

#### **6.3.3.1 Petroleum Hydrocarbons**

Two leachate water samples were submitted for PHC analysis. Laboratory analytical results are included in Table 13 of Appendix C. The laboratory certificates are included in Appendix D.

Both leachate samples submitted reported PHC concentrations that ranged from below the laboratory detection limits to trace levels, thus satisfying the applicable Ecological Tier I EQSs and the NL ECWSRs.

#### **6.3.3.2 Metals (total/dissolved)**

Six groundwater samples plus one field duplicate sample were submitted for metal (total/dissolved) analysis. Laboratory analytical results are included in Table 14 and 15 of Appendix C. The laboratory certificates are included in Appendix D.

Total Metal Exceedances of Tier I EQS:

- Aluminum in leachate sample PLCS;
- Boron in leachate sample SLCS;
- Copper in leachate samples PLCS;
- Iron in leachate samples PLCS and SLCS; and,
- Manganese in leachate sample SLCS.

Dissolved Metal Exceedances of Tier I EQS:

- Aluminum in leachate samples PLCS and SLCS ;
- Copper in leachate samples PLCS;
- Iron in leachate samples PLCS and SLCS;
- Manganese in leachate sample SLCS; and,
- Sulfur in leachate samples PLCS and SLCS.

All other metal parameters satisfy applicable 2021 Atlantic RBCA Ecological Tier I EQS.

Total and dissolved iron was reported to exceed the NL ECWSRs in the SLCS.

### **6.3.3.3 PAHs**

Two leachate water samples were submitted for PAH analysis. Laboratory analytical results are included in Table 16 of Appendix C. The laboratory certificates are included in Appendix D.

The PAH parameters reported ranged from below detectable limits to concentrations which exceeded the applicable Ecological Tier I EQSs. There are no guidance criteria for PAH parameters provided in the NL ECWSRs. The following parameters exceeded the applicable guidelines:

- Benzo(a)pyrene and Fluoranthene in SLCS; and,
- Pyrene in SLCS.

### **6.3.3.4 VOCs**

Two leachate water samples were submitted for VOC analysis. Laboratory analytical results are included in Table 17 of Appendix C. The laboratory certificates are included in Appendix D.

The VOC parameters reported ranged from below detectable limits, thus, satisfying the applicable Ecological Tier I EQSs. There are no guidance criteria for VOC parameters provided in the NL ECWSRs.

### **6.3.3.5 PCBs**

Two leachate water samples were submitted for PCB analysis. Laboratory analytical results are included in Table 18 of Appendix C. The laboratory certificates are included in Appendix D.

The PCB parameters reported below detectable limits, however, the applicable Ecological Tier I EQS for discharge to fresh water guideline (0.001 µg/L) is lower than the RDL (0.06 µg/L). There are no guidance criteria for PCBs provided in the NL ECWSRs.

### **6.3.3.6 General Chemistry**

Two leachate water samples were submitted for general chemistry analysis. Laboratory analytical results are included in Table 19 of Appendix C. The laboratory certificates are included in Appendix D.

The general chemistry parameters reported ranged from below detectable limits to trace levels, thus, satisfying the applicable Ecological Tier I EQSs and the NL ECWSRs.

### **6.3.3.7 Lethality Testing**

Two leachate water samples were submitted for lethality analysis. Laboratory analytical results are included in Table 20 of Appendix C. The laboratory certificates are included in Appendix D.

The leachate samples collected passed the acute lethality testing.

## 6.4 Quality Assurance/Quality Control

Englobe conducted the environmental sampling following standard operating procedures, including job procedures and safe work practices. The sampling was conducted in accordance with all pertinent acts, regulations, codes, guidelines, and standard practices.

All groundwater, surface water and leachate samples were logged by Englobe personnel and submitted under chain of custody to ALS Canada. ALS Canada conducts their own internal QA/QC programs consistent with relevant standards and requirements for laboratory certification. The measured values and recoveries are compared to acceptable lower and upper limits. ALS's QA/QC results were reviewed by Englobe and were found to be within acceptable limits and details can be found on the lab certificates in Appendix D.

Based on the results of the QA/QC program, the analytical results are considered reliable and acceptable.

# 7 Maintenance Program

## 7.1 Leachate

Prior to discharging leachate from both liner collection chambers a review of the reported analytical data was conducted and compared to the NL Regulation 65/03, ECWSR (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water). Once reviewed by Englobe, the analytical results from the leachate samples were submitted to the Department of Environment and Climate Change for approval prior to pumping.

Based on the analytical results, concentrations of PHCs, VOCs, general chemistry parameters and acute lethality were reported to be non-detect for the samples collected from each chamber. Various concentrations of PAHs and metals (total and dissolved) were detected in both of the samples; however, all detected parameters excluding iron satisfied the NL ECWSRs where applicable.

Concentrations of iron, both dissolved (17,700 µg/L) and total (22,100 µg/L), collected from the secondary liner containment system exceeded the NL ECWSRs of 10,000 µg/L; therefore, Englobe recommended pumping the leachate for disposal rather than discharging to the environment. Approval for the proposed pumping event was provided from the Department of Environment and Climate Change on April 4<sup>th</sup>, 2023.

On April 5 and 6, 2023, Englobe supervised the pumping of leachate conducted by Pardy's Waste Management. Approximately 50,000 L of leachate was pumped from the PLCS and the SLCS over a two-day period and disposal at Pardy's licensed treatment facility.

## 7.2 Inspection of Monitor Well

Englobe conducted an inspection of the monitor wells on multiple visits between December 21, 2022, and April 6, 2023, and noted that the monitor wells appear to be in good condition. Englobe noted that the dedicated bailers installed in the wells are showing signs of age and should be replaced during the next monitoring program.

## 7.3 Inspection of Groundwater Drainage System

Englobe conducted a visual assessment of the groundwater drainage system located to the north and west of the landfill. Upon inspection, Englobe was able to locate and inspect clean-outs (CO) 1 through 3; however, CO4 was not able to be located during the current assessment. Based on Englobe inspection, CO1 to CO3 appear to be in good condition with no obvious signs of blockage observed. However, Englobe was not able to identify if the system was working or not, as visual inspection could not be conducted on the horizontal drainage line running alongside the landfill.

Inspection of the outfall was not possible during the assessment as access to the adjacent property was not possible as the area is now fenced private property. A visual inspection of the slope of the adjacent property was conducted alongside the chain-link fence; however, the outfall was not able to be located. In addition, there were no obvious signs of a water outfall along the adjacent property perimeter. Based on this fact, it is possible that the groundwater drainage system's outfall could be damaged or destroyed.

## 7.4 Vegetation Control

An inspection of the vegetation height on the landfill cover was conducted by Englobe on December 21, 2022. Due to previous clearing, current vegetation is at an average height of 0.6 m. Englobe recommends that the height of vegetation continue to be monitored.

## 7.5 Landfill Cover Inspection

A landfill cover inspection was conducted by Englobe on January 4, 2023. The following items were noted during the inspection:

- Evidence of erosion, meadow vole and/or large animal activity was not noted during the inspection;
- Slopes of the landfill were observed to be in good condition and covered with vegetation;
- No evidence of settlement was observed;
- The landfill vents (V1 and V2) were observed to be in good condition and free from obstruction; and,
- The outflow drainage pipe could not be located during the site visit.

## 7.6 Elevation Control Point Survey

An elevation control point survey was conducted on April 6, 2023. Initial GPS co-ordinates for the four elevation control points locations were provided in historical reports available on the Department of Environment and Climate Change's website. The control point used for the survey was identified as 82G3044 on the Newfoundland and Labrador Geodetic Network database.

Table 7-1 presents the results of the elevation control survey. Based on the results of the current survey it appears that settling has occurred at the site since installation of the elevation control points.

**Table 7-1- Summary of Elevations Control Points**

Location	Original Elevation (m) Jul 16, 2012	2023 Survey (m)	Difference (m)
PLCS	15.960	15.944	0.016
SLCS	15.955	15.932	0.023
ECP1	20.439	20.435	0.004
ECP2	20.442	20.321	0.121
ECP3	20.935	20.902	0.033
ECP4	21.212	20.949	0.263

## 8 Discussion

Based on the results of the 2022-2023 monitoring sampling event, observations, information gathered, and historical laboratory analytical data obtained during previous sampling events completed at the site, the following environmental information has been used to determine the potential for trends. As guidance criteria has been updated since the initial analytical data was reviewed, a direct comparison of exceedances observed from data collected from 2009 to 2017 could not be made with the two recent programs completed since 2021. Historical analytical data prior to 2021 was compared to the MOE Guidelines for Full Depth Generic Site Condition Standards and the CCME CWQGs, while data collected during monitoring programs completed since 2021 has been compared to the Atlantic RBCA - User Guidance (Version 4.0, July 2021, updated July 2022) for groundwater and surface water. However, leachate has been compared to the NL Regulation 65/03, ECWSR (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water) which has been guidance criteria since the initial monitoring program.

### 8.1.1 Groundwater

Concentrations of PHC, PAHs, VOCs and PCBs have reported to be non-detect or detected at concentrations which are below the applicable guidelines since the initial groundwater monitoring event conducted in 2009.

The historical 2009-2017, 2021 and 2022 groundwater quality results are consistent in terms of metals detected during some or all sampling events. Current concentrations of aluminum have been reported to exceed the applicable guidelines in one of the onsite monitor wells; however, although historical concentrations are reported to be within the same fluctuating range as the current assessment, no guidance criteria was identified within the MOE Guidelines for Full Depth Generic Site Condition Standards. Various other metals (i.e., Cobalt, Copper, Cadmium, Magnesium and Zinc) have reported exceedances of the applicable guidelines. No significant trends were identified due to the annual variability of the identified exceedances year to year; however, the following are noted:

- pH: pH has historically remained within the acceptable range with a slight decrease from 2021 to 2023;
- Cadmium: historical concentrations of cadmium have fluctuated with a decrease from 2021 to 2023;
- Molybdenum: molybdenum concentrations have historically remained consistent overall; however, all the historic and current concentrations are above Tier 1 EQS guidelines;
- Aluminum: aluminum concentration has historically been below applicable guidelines; however, a slight increase in concentration was observed from 2022 to 2023;

- Iron: a slight increase in the concentration of iron was observed from 2022 to 2023; and,
- Zinc: zinc concentrations have been historically within range; however, historic and current concentrations are above Tier 1 EQSs guidelines.

### 8.1.2 Surface Water

Concentrations of PHC, PAHs, VOCs and PCBs have reported to be non-detect or detected at concentrations which are below the applicable guidelines since the initial surface water monitoring event conducted in 2009.

Based on historical surface water data, surface water quality at the upstream location (i.e., SURF-UP) and at the downstream location (i.e., SURF-DOWN) has remained consistent with the exception of some seasonal elevated concentrations of individual parameters.

The historical 2009-2017, 2021 and 2022 surface water quality results are consistent in terms of metals detected during some or all sampling events. Current and historical concentrations of aluminum have been reported to exceed the applicable guidelines. Various other metals have reported exceedances of the applicable guidelines. No significant trends were identified due to the annual variability of the identified exceedances year to year; however, the following are noted:

- Aluminum: aluminum concentrations have historically have been within range; however, the historic and current concentrations are above the Tier 1 EQSs;
- Cadmium: cadmium has shown a decrease from 2022 to 2023 in both the upgradient and the downgradient samples;
- Iron: iron concentrations has historically been within range; however, a slight decrease is observed from 2022 to 2023; and,
- pH: pH has historically shown to be trending down since the monitoring began in the late 2000s.

### 8.1.3 Leachate

Concentrations of PHC, PAHs, VOCs and PCBs have reported to be non-detect or detected at concentrations which are below the applicable guidelines since the initial leachate monitoring event conducted in 2009.

The historical 2009-2017, 2021 and 2022 leachate quality results are consistent in terms of metals detected during some or all sampling events. Historical and current concentrations of various metals have been reported to exceed the applicable ecological guidelines in the leachate samples submitted. Concentrations of iron reported throughout various years of historical monitoring and within the two most current monitoring years have been reported to exceed the applicable guidelines for discharge to the environment (i.e., NL Regulation 65/03, ECWSR (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water)). With the exception of iron which has regularly exceeded the ECWSR guidelines, no significant trends were identified due to the annual variability of the identified exceedances year to year; however, the following was noted:

- Nitrate as N: the concentration of nitrate as N indicated an increase in the PLCS in 2023;
- Iron: historical iron concentrations have fluctuated with a slight decrease observed from 2022 to 2023
- Aluminum: aluminum concentrations have historically been within range; however, these concentrations are above the Tier 1 EQSs
- Calculated TDS: historical results of calculated TDS have been within range; however, a significant increase in concentration was observed in 2023;



- Boron: boron concentrations have historically been within in range; and,
- pH: pH has historically remained within the acceptable range.

## 9 Conclusion and Recommendations

The results of the 2022/2023 Maintenance and Monitoring Program are summarized as follows:

- Six existing monitor wells were located and sampled including MW93-1, MW93-1A, MW93-2, MW-932A, MW10-1 and MW10-1A, two surface water locations were sampled including SURF-UP and SURF-DOWN and two leachate samples were collected from each of the liner collection systems (PLCS and SLCS);
- The depths to groundwater in the monitor wells ranged from 0.99 mbgs in monitor well MW10-01 to 3.01 mbgs in MW93-1A on December 21, 2022 and January 4, 2023;
- Measurable free liquid phase petroleum hydrocarbons were not observed in groundwater in any of the monitor wells during the 2022/2023 maintenance and monitoring program;
- Concentrations of petroleum hydrocarbons, PAHs, VOCs and PCBs in groundwater samples collected from monitor wells MW93-1, MW93-1A, MW93-2, MW-932A, MW10-1 and MW10-1A satisfied the applicable Ecological Health Tier I EQSs;
- Concentrations of aluminum, cadmium, iron, manganese, molybdenum, silicon and zinc in some or all of the groundwater monitor wells exceeded the applicable Ecological Health Tier I EQSs. All other metal parameters satisfy applicable Ecological Health Tier I EQS;
- Concentrations of ammonia as N exceeded the applicable Ecological Health Tier I EQSs in four of the six groundwater samples collected the on-site monitor wells;
- Concentrations of petroleum hydrocarbons, PAHs, VOCs and PCBs in surface water samples collected from the unnamed brook located southeast of the landfill satisfied the applicable Ecological Health RBCA Tier I EQSs;
- Concentrations of aluminum and iron in surface water samples collected from the unnamed brook located southeast of the landfill exceeded the applicable Ecological Health RBCA Tier I EQSs. All other metal parameters satisfy applicable Ecological Health Tier I EQS;
- pH in one of the surface water samples (i.e., SURF-DOWN) collected from the unnamed brook located to the southeast of the landfill was reported to be outside of the acceptable range for pH as per the Ecological Health Tier I EQS;
- Concentrations of dissolved and total iron in one of the leachate samples (i.e., SLCS) collected from the liner containment chambers was reported to exceed the NL Regulation 65/03, ECWSR (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water). Based on this reported exceedance Englobe recommended pumping of the leachate for offsite disposal;
- Between April 5 and 6, 2023, 50,000 L of leachate was pumped from the PLCS and the SLCS containment chambers by Pardy's Waste Management under the supervision of Englobe personnel;
- An inspection of the groundwater drainage system clean outs indicated that only 3 of the 4 clean-outs were located (i.e., CO1 to CO3). Where located, the clean-outs appear to be in good condition; and,



- Englobe could not access the adjacent property to inspect the outfall as it is a fenced private property; however, based on a visual assessment of the general area from the outside of the fenced area, the outfall could not be located.

Based on the available environmental data, no unacceptable risks to ecological receptors are anticipated at the site under current site conditions.

However, some considerations with respect to future operations of the site are outlined below:

- Continue to conduct annual groundwater, surface water and leachate monitoring and sampling in 2023/2024 to confirm groundwater, surface water and leachate quality at the site and down-gradient of the site. Conduct a trend analysis of the historical data including the additional monitoring;
- Complete a full assessment of the groundwater drainage system to determine if the system is still functioning as designed with emphasis on locating CO4 and the outfall on the adjacent property; and,
- Consideration should be given to placement of GW monitor wells downgradient of the landfill to aid in monitoring the conditions of the offsite groundwater conditions downgradient from the landfill.

## 10 Report Use and Conditions

This report was prepared for the exclusive use of Government of Newfoundland and Labrador-Department of Environment and Climate Change, and is based on data and information obtained during a site visit by Englobe on the subject property; and is based solely upon the condition of the property on the date of such inspection, supplemented by information obtained and described herein.

The evaluation and conclusions contained in this report have been prepared in light of the expertise and experience of Englobe Corp. In evaluating the property, Englobe has relied in good faith upon representation and information furnished by individuals noted in the report with respect to operations and existing property conditions and the historic use of the property to the extent that they have not been contradicted by data obtained by other sources. Accordingly, Englobe accepts no responsibility for any deficiency or inaccuracy in this report as a result of omissions, misstatements or misrepresentations of the persons interviewed. In addition, Englobe will not accept liability for loss, injury, claim or damage arising from any use or reliance on this report as a result of misrepresentation or fraudulent information.

Environmental conditions are dynamic in nature and changing circumstances in the environment and in the use of the property can alter radically the conclusions and information contained herein.

# Appendix A

# Site Figures





**LEGEND**

- ◇ SURFACE WATER SAMPLE LOCATION
- MONITORING WELL LOCATION
- DECOMMISSIONED MONITORING WELL LOCATION (CRA 2010)
- VALVE CHAMBER LOCATION
- VENT LOCATION
- CLEAN OUT LOCATION
- FENCE LINE
- - - GROUNDWATER DRAINAGE SYSTEM

**GENERAL NOTES:**

1. PROJECTION: MTM NAD83, ZONE 1.
2. SITE FEATURES ARE APPROXIMATE ONLY. SUBJECT TO SURVEY.

**CLIENT:**

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR  
DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE

**PROJECT:**

2022/2023 MONITORING AND MAINTENANCE PROGRAM, COME BY CHANCE HAZARDOUS WASTE LANDFILL  
COME BY CHANCE, NL

**DRAWING TITLE:**

SITE PLAN

**SCALE:**

1:1250

**CONSULTANT:**



Project manager :MS Date :MAY. 2023

Drawn : SM Checked : LC Approved :

Department	Project	Otp	Disc.	Type	Drawing n°	Rev.
	2210292.000				1	

◇ SURFACE-DOWN

# Appendix B

## Site Photographs







Photo 1: View of vegetation density and height on top of the landfill liner; photo taken facing south.



Photo 2: View of vegetation density and height on top of the landfill liner; photo taken facing west.





Photo 3: Area identified for CO4 as per pervious monitoring reports; photo taken facing east. CO4 could not be located by Englobe.



Photo 4: Area identified for CO4 as per pervious monitoring reports; photo taken facing east. CO4 could not be located by Englobe.





Photo 5: View of MW10-01 and MW10-01A located on the northwest corner of the landfill.



Photo 6: View of MW93-1 and MW93-1A located on the northeast corner of the landfill.





Photo 7: View of the conditions and static water level in the primary liner containment system (PLCS).



Photo 8: View of the conditions and static water level in the secondary liner containment system (SLCS).





Photo 9: Area identified as the location of the groundwater drainage system (GDS) outfall as per previous monitoring reports; photo taken facing north. The outfall could not be located by Englobe.



Photo 10: Area identified as the location of the groundwater drainage system (GDS) outfall as per previous monitoring reports; photo taken facing south. The outfall could not be located by Englobe.

# Appendix C

## Analytical Tables



**TABLE 1: PETROLEUM HYDROCARBONS in Groundwater**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER		RDL	UNITS	RBCA TIER I EQSs 1	RBCA Ecological Tier I EQS		SAMPLE ID and Date						
					Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
							21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
BTEX	Benzene	0.00050	mg/L	6.3	4.6	4.6	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Toluene	0.00050	mg/L	20	4.2	4.2	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Ethylbenzene	0.00050	mg/L	20	3.2	3.2	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Xylenes	0.00050	mg/L	20	2.8	2.8	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>6</sub> -C <sub>10</sub> )	0.025	mg/L	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Fuel Range (>C <sub>10</sub> -C <sub>16</sub> )	0.050	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Fuel Range (>C <sub>16</sub> -C <sub>21</sub> )	0.050	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Lube Range (>C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Total Modified TPH		0.090	mg/L	20 as gas 20 as fuel oil 20 as lube oil	13 as gas 0.84 as fuel oil 0.48 as lube oil		<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Reached Baseline at C32		-	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product Resemblance		none	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Notes:**

\* Indicates field duplicate.

<sup>1</sup> Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for Groundwater for a commercial site with non-potable groundwater usage and coarse-grained soil (July 2021, updated July 2022).

<sup>2, 3</sup> Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

TABLE 2: METALS (DISSOLVED) in Groundwater  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date						
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
					21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
Aluminum	1	ug/L	50	-	49.6	11.2	15.4	4.1	1.9	473	11.90
Antimony	0.1	ug/L	90	2,500	0.11	0.22	0.22	<0.10	<0.10	<0.10	0.27
Arsenic	0.1	ug/L	50	125	0.96	0.34	0.36	0.91	<0.10	0.19	2.31
Barium	0.1	ug/L	10,000	5,000	26.4	29.6	31.0	55.4	81.8	97.2	14.7
Beryllium	0.02	ug/L	1.5	1,000	0.024	<0.020	<0.020	<0.020	<0.020	1.25	<0.020
Bismuth	0.05	ug/L	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Boron	10	ug/L	15,000	12,000	<10	<10	<10	83	65	12	535
Cadmium	0.005	ug/L	0.9	1.2	0.0061	0.0168	0.0184	<0.0050	<0.0050	5.99	0.0150
Calcium	50	ug/L	-	-	20,700	22,100	22,200	24,200.00	41,400.00	11,100.00	54,200.00
Cesium	0.01	ug/L	-	-	0.078	0.050	0.050	0.063	0.015	0.025	0.076
Chromium (total)	0.5	ug/L	89	560	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	0.1	ug/L	10	40	1.44	2.48	2.53	<0.10	<0.10	4.06	<0.10
Copper	0.2	ug/L	20	10	3.51	4.01	3.92	1.11	0.42	2.38	0.70
Iron	10	ug/L	3,000	-	7,240	670	480	<10	<10	789	30
Lead	0.05	ug/L	10	20	0.170	0.065	0.059	<0.050	<0.050	0.988	<0.050
Lithium	1	ug/L	-	-	<1	<1	<1	8.2	16.3	4.2	7.5
Magnesium	5	ug/L	-	-	1,270	4,180	3,920	12,300	19,000	4,830	12,400
Manganese	0.1	ug/L	4,300	-	240	560	623	2.82	1.57	5,810	46.8
Molybdenum	0.005	ug/L	0.26	0.16	2.16	2.51	2.60	18.3	12.9	0.052	0.251
Nickel	0.05	ug/L	730	10,000	1.59	3.07	3.07	<0.50	0.60	6.08	<0.50
Phosphorus	0.5	ug/L	250	83	<50	<50	<50	<50	<50	<50	<50
Potassium	50	ug/L	-	-	634	834	792	1,600	2,420	1,080	1,210
Rubidium	50	ug/L	-	-	0.76	0.77	0.71	0.85	0.86	2.02	0.84
Selenium	0.2	ug/L	-	-	0.216	0.112	0.084	<0.050	<0.050	<0.050	<0.050
Silicon (as SiO <sub>2</sub> )	0.05	ug/L	10	20	2,740	11,200	11,200	7,760	7,680	6,950	17,400
Silicon	50	ug/L	-	-	1,280	5,250	5,250	3,630	3,590	3,250	8,120
Silver	0.01	ug/L	2.50	15.0	0.032	0.014	0.010	<0.010	<0.010	<0.010	<0.010
Sodium	50	ug/L	-	-	6,580	5,450	5,600	66,900	82	17,100	21,000
Strontium	0.2	ug/L	210,000	-	49.8	58.8	60.5	200	302	68.3	203
Sulfur	500	ug/L	-	-	1,340	3,900	3,880	13,400	16,400	19,500	13,800
Tellurium	0.2	ug/L	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	0.01	ug/L	8	3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Thorium	0.1	ug/L	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	0.1	ug/L	-	-	<0.10	0.18	0.13	<0.10	<0.10	<0.10	0.50
Titanium	0.3	ug/L	-	-	1.77	<0.30	<0.30	<0.30	<0.30	0.37	<0.30
Tungsten	0.1	ug/L	-	-	1.79	0.56	0.53	13.7	10.1	<0.10	<0.10
Uranium	0.01	ug/L	150	85	0.286	0.077	0.076	0.430	2.98	0.021	0.151
Vanadium	0.05	ug/L	1,200	50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Zinc	1	ug/L	70	100	2.3	3.8	4.7	2.0	1.4	1,180	28.2
Zirconium	0.3	ug/L	-	-	0.65	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Notes:

1, 2 Atlantic RBCA Ecological Tier I EQS for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

Value Exceeds Fresh Water or Marine criteria reference below.

**TABLE 3: POLYCYCLIC AROMATIC HYDROCARBONS in Groundwater**  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Human Health- Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date						
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
						21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
1- Methyl-naphthalene	0.01	ug/L	-	20	10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
2-Methyl-naphthalene	0.01	ug/L	-	20	10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthene	0.01	ug/L	-	58	60	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthylene	0.01	ug/L	7,500	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	0.01	ug/L	NGR	0.12	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)anthracene	0.01	ug/L	-	0.18	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	0.005	ug/L	-	0.15	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	-	-	-	-	-	-	-	-
Benzo(b,j)fluoranthene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	0.01	ug/L	-	1	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.01	ug/L	-	0.4	2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluorene	0.01	ug/L	-	30	120	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	0.01	ug/L	7,000	11	14	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perylene	0.01	ug/L	-	-	-	<0.010	0.020	<0.010	<0.010	<0.010	0.048	<0.010
Phenanthrene	0.01	ug/L	-	4	3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Pyrene	0.01	ug/L	-	0.25	0.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

**Notes:**

\* Indicates field duplicate sample.

<sup>1</sup> Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).

<sup>2,3</sup> Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.



**TABLE 4: VOLATILE ORGANIC COMPOUNDS in Groundwater**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Human Health-Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date						
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
						21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
1,2-Dichlorobenzene	0.50	ug/L	64,000	7	420	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	-	1,500	1,500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.50	ug/L	2600	260	260	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	0.50	ug/L	180	13	250	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	0.50	ug/L	13,000	100	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	630	700	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	0.50	ug/L	910	8,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	0.50	ug/L	6,600	2,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	0.50	ug/L	5,600	400	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	0.50	ug/L	130	1,000	1,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	0.50	ug/L	330	7	30,400	5.74	<0.50	5.72	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	-	2,000	64,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform (Tribromomethane)	0.50	ug/L	84,000	600	64,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane (Methyl bromide)	0.50	ug/L	33	9	64,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	6.9	133	130	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane (Ethyl chloride)	0.50	ug/L	-	11,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform (Trichloromethane)	0.50	ug/L	380	18	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane (Methyl chloride)	2.00	ug/L	-	7,000	64,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethylene	0.50	ug/L	4,600	2,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dibromochloromethane	0.50	ug/L	10,000	400	64,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylene Dibromide (1,2-Dibromoethane)	0.20	ug/L	51	50	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methylene Chloride (Dichloromethane)	1.00	ug/L	43,000	981	980	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	0.50	ug/L	26,000	720	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	660	1,100	1,100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	0.50	ug/L	4,900	2,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	110	210	200	1.35	<0.50	1.30	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane (Freon 11)	0.50	ug/L	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	0.50	ug/L	99	6,000	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

**Notes:**

<sup>1</sup> Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).

<sup>2,3</sup> Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**TABLE 5: POLYCHLORINATED BIPHENYLS in Groundwater**  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Human Health-Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date						
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
						21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
Polychlorinated Biphenyls	0.060	ug/L	180	0.01	-	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060

**Notes:**

<sup>1</sup> Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).

<sup>2,3</sup> Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**Value** Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.

**TABLE 6: GENERAL CHEMISTRY in Groundwater**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date						
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	MW10-01	MW10-01A	MW10-01(DUP)	MW93-1	MW93-1A	MW93-2	MW93-2A
					21-Dec-22	21-Dec-22	21-Dec-22	4-Jan-23	4-Jan-23	4-Jan-23	4-Jan-23
pH	0.1	-	6.5 - 9	7.0 - 8.7	7.11	7.39	7.22	8.22	8.05	5.13	8.04
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCl)	9,970	7,850	9,560	12,400	9,790	26,900	20,500
Fluoride	20	ug/L	120	1500	26	42	25	228	107	72	42
Sulphate	300	ug/L	128,000	-	11,600	4,410	11,500	37,000	45,700	57,500	36,700
Alkalinity	1000	ug/L	-	-	60,600	76,700	61,600	202,000	298,000	1,900	178,000
True Color	2	TCU	-	-	2150	1810	1830	17.7	111	1960	26.0
Turbidity	0.1	NTU	-	-	345	303	267	5.14	45.4	175	10.3
Electrical Conductivity	1	uS/cm	-	-	178	172	176	488	668	242	473
Nitrate + Nitrite as N	3.2	ug/L	-	-	44	123	37	22	<22.4	293	25
Nitrate as N	20	ug/L	13,000	200,000	44	123	37	<20	<20	293	25
Nitrite as N	10	ug/L	60	-	<10	<10	<10	<10	<10	<10	<10
Ammonia as N	5	ug/L	7.11 (MW10-01 and MW10-01(DUP)); 7.32 (MW10-01A); 2.33 (MW93-1 and MW93-1A ); 231 (MW93-2 and MW93-2A)	18,500 (MW10-01, MW10-01A, MW10-01(DUP)); 3,700 (MW93-1, MW93-1A and MW93-2A); 18,400 (MW93-2)	165	13.9	45.2	9.8	10.7	139	7.1
Ortho-Phosphates as P	1	ug/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	73,900	93,600	75,200	247,000	363,000	2,300	217,000
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Hydroxide	1000	ug/L	-	-	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Calculated TDS	10	ug/L	-	-	129,000	144,000	127,000	290,000	392,000	188,000	304,000
Langelier Index (@20C)	0.01	NA	-	-	-1.15	-0.746	-1.00	0.484	0.691	-4.84	0.597
Langelier Index (@4C)	0.01	NA	-	-	-1.40	-0.998	-1.25	0.237	0.444	-5.10	0.350
Saturation pH (@20C)	0.01	NA	-	-	8.26	8.14	8.22	7.74	7.36	9.98	7.44
Saturation pH (@4C)	0.01	NA	-	-	8.51	8.39	8.47	7.98	7.60	10.2	7.69
Anion Sum	0.1	me/L	-	-	1.74	1.86	1.74	5.17	7.19	2.02	4.90
Cation Sum	0.1	me/L	-	-	1.72	1.73	1.72	5.17	7.28	2.07	4.67
% Difference / Ion Balance	0.01	%	-	-	98.8	93.0	98.8	100	101	102	95.3

Notes:

1, 2 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

Value <sup>A</sup> Exceeds Fresh Water or Marine criteria reference below.



**TABLE 7: PETROLEUM HYDROCARBONS in Surface Water**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER		RDL	UNITS	RBCA Ecological Tier I EQS <sup>1</sup>		SAMPLE ID, Date		
				Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN
						21-Dec-22	21-Dec-22	(DUP) 21-Dec-22
BTEX	Benzene	0.00050	mg/L	2.1		<0.00050	<0.00050	<0.00050
	Toluene	0.00050	mg/L	0.77		<0.00050	<0.00050	<0.00050
	Ethylbenzene	0.00050	mg/L	0.32		<0.00050	<0.00050	<0.00050
	Xylenes	0.00050	mg/L	0.33		<0.00050	<0.00050	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>6</sub> -C <sub>10</sub> )	0.025	mg/L	-		<0.025	<0.025	<0.025
	Fuel Range (>C <sub>10</sub> -C <sub>16</sub> )	0.050	mg/L	-		<0.050	<0.050	<0.050
	Fuel Range (>C <sub>16</sub> -C <sub>21</sub> )	0.050	mg/L	-		<0.050	<0.050	<0.050
	Lube Range (>C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-		<0.050	<0.050	<0.050
Total Modified TPH		0.090	mg/L	1.5 as gas 0.10 as fuel oil / lube oil		<0.090	<0.090	<0.090
Reached Baseline at C32		-	-	-		Yes	Yes	Yes
Product Resemblance		none	-	-		N/A	N/A	N/A

**Notes:**

\* Indicates field duplicate.

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

TABLE 8: METALS (TOTAL) in Surface Water  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date		
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN (DUP)
					21-Dec-22	21-Dec-22	21-Dec-22
Aluminum	30	ug/L	5	-	150	151	156
Antimony	0.10	ug/L	9	250	<0.10	<0.10	<0.10
Arsenic	0.10	ug/L	5	12.5	0.22	0.21	0.20
Barium	0.10	ug/L	1,000	500	6.5	6.3	6.5
Beryllium	0.020	ug/L	0.15	100	<0.020	<0.020	<0.020
Bismuth	0.050	ug/L	-	-	<0.050	<0.050	<0.050
Boron	10	ug/L	1,500	1,200	<10	<10	<10
Cadmium	0.005	ug/L	0.09	0.12	<0.005	<0.005	<0.005
Calcium	100	ug/L	-	-	2,260	2,390	2,560.00
Cesium	0.01	ug/L	-	-	0.015	0.011	0.013
Chromium (total)	0.50	ug/L	8.9	56	<0.50	<0.50	<0.51
Cobalt	0.10	ug/L	1	4	<0.10	<0.10	<0.10
Copper	0.50	ug/L	2	2	0.50	<0.50	0.53
Iron	10	ug/L	300	-	437	411	421
Lead	0.05	ug/L	1	2	0.183	0.146	0.156
Lithium	1.00	ug/L	-	-	<1.0	<1.0	<1.0
Magnesium	0.10	ug/L	-	-	666	676	689
Manganese	0.10	ug/L	430	-	25	30	31.7
Molybdenum	0.50	ug/L	73	1000	0.06	0.06	0.054
Nickel	5	ug/L	25	8.3	0.63	0.65	0.70
Phosphorus	50	ug/L	-	-	<50	<50	<50
Potassium	50	ug/L	-	-	256	250	257
Rubidium	0.20	ug/L	-	-	0.38	0.34	0.37
Selenium	0.50	ug/L	1	2	0.069	0.056	0.058
Silicon (as SiO <sub>2</sub> )	250	ug/L	-	-	2,350	2,350	2,310
Silicon	100	ug/L	-	-	1,100	1,100	1,080
Silver	0.01	ug/L	0.25	1.5	<0.010	<0.010	<0.010
Sodium	50	ug/L	-	-	6,310	6,340	8,450
Strontium	0.20	ug/L	21,000	-	8.94	9.16	9.25
Sulfur	500	ug/L	-	-	580	740	3,330
Tellurium	0.20	ug/L	-	-	<0.20	<0.20	<0.20
Thallium	0.01	ug/L	0.8	0.3	<0.010	<0.010	<0.010
Thorium	0.10	ug/L	-	-	<0.10	<0.10	<0.10
Tin	0.10	ug/L	-	-	<0.10	<0.10	<0.10
Titanium	0.30	ug/L	-	-	3.30	2	3
Tungsten	0.10	ug/L	-	-	<0.10	<0.10	<0.10
Uranium	0.01	ug/L	15	8.5	0.012	0.012	0.014
Vanadium	0.50	ug/L	120	5	1.0	0.95	1.0
Zinc	3	ug/L	7	10	<3	<3	<3
Zirconium	0.20	ug/L	-	-	<0.20	<0.20	<0.20

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022)

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

Value <sup>1</sup>	Exceeds Fresh Water or Marine criteria reference below.
Value	Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.

**TABLE 9: POLYCYCLIC AROMATIC HYDROCARBONS in Surface Water**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date		
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN (DUP)
					21-Dec-22	21-Dec-22	21-Dec-22
1- Methylnaphthalene	0.01	ug/L	2	1	<0.010	<0.010	<0.010
2-Methylnaphthalene	0.01	ug/L	2	1	<0.010	<0.010	<0.010
Acenaphthene	0.01	ug/L	5.8	6	<0.010	<0.010	<0.010
Acenaphthylene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Anthracene	0.01	ug/L	0.012	0.1	<0.010	<0.010	<0.010
Benzo(a)anthracene	0.01	ug/L	0.018	-	<0.010	<0.010	<0.010
Benzo(a)pyrene	0.005	ug/L	0.015	0.01	<0.0050	<0.0050	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	-	-	-
Benzo(b/j)fluoranthene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Chrysene	0.01	ug/L	0.1	0.1	<0.010	<0.010	<0.010
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	<0.0050	<0.0050	<0.0050
Fluoranthene	0.01	ug/L	0.04	0.2	<0.010	<0.010	<0.010
Fluorene	0.01	ug/L	3	12	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Naphthalene	0.01	ug/L	1.1	1.4	<0.010	<0.010	<0.010
Perylene	0.01	ug/L	-	-	<0.010	<0.010	<0.010
Phenanthrene	0.01	ug/L	0.4	0.3	<0.010	<0.010	<0.010
Pyrene	0.01	ug/L	0.025	0.02	<0.010	<0.010	<0.010

**Notes:**

\* Indicates field duplicate sample.

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

TABLE 10: VOLATILE ORGANIC COMPOUNDS in Surface Water  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date		
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN (DUP)
					21-Dec-22	21-Dec-22	21-Dec-22
1,2-Dichlorobenzene	0.50	ug/L	0.7	42	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	150	150	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.50	ug/L	26	26	<0.50	<0.50	<0.50
Chlorobenzene	0.50	ug/L	1.3	25	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	0.50	ug/L	10	-	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	70	-	<0.50	<0.50	<0.50
1,1,1,2-Trichloroethane	0.50	ug/L	800	-	<0.50	<0.50	<0.50
1,1-Dichloroethane	0.50	ug/L	200	-	<0.50	<0.50	<0.50
1,1-Dichloroethylene	0.50	ug/L	40	-	<0.50	<0.50	<0.50
1,2-Dichloroethane	0.50	ug/L	100	100	<0.50	<0.50	<0.50
1,2-Dichloropropane	0.50	ug/L	1	3,040	<0.50	<0.50	<0.50
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	200	6,400	<0.50	<0.50	<0.50
Bromoform (Tribromomethane)	0.50	ug/L	60	6,400	<0.50	<0.50	<0.50
Bromomethane (Methyl bromide)	0.50	ug/L	1	6,400	<0.50	<0.50	<0.50
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	13	13	<0.20	<0.20	<0.20
Chloroethane (Ethyl chloride)	0.50	ug/L	5	-	<0.50	<0.50	<0.50
Chloroform (Trichloromethane)	0.50	ug/L	1.8	2	<0.50	<0.50	<0.50
Chloromethane (Methyl chloride)	2.00	ug/L	700	6,400	<2.0	<2.0	<2.0
cis-1,2-Dichloroethylene	0.50	ug/L	200	-	<0.50	<0.50	<0.50
cis-1,3-Dichloropropylene	0.30	ug/L	-	-	<0.30	<0.30	<0.30
Dibromochloromethane	0.50	ug/L	40	6,400	<0.50	<0.50	<0.50
Ethylene Dibromide (1,2-Dibromoethane)	0.20	ug/L	5	-	<0.20	<0.20	<0.20
Methylene Chloride (Dichloromethane)	1.00	ug/L	98	98	<1.0	<1.0	<1.0
Styrene	0.50	ug/L	72	-	<0.50	<0.50	<0.50
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	110	110	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	0.50	ug/L	200	-	<0.50	<0.50	<0.50
trans-1,3-Dichloropropylene	0.30	ug/L	-	-	<0.30	<0.30	<0.30
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	21	20	<0.50	<0.50	<0.50
Trichlorofluoromethane (Freon 11)	0.50	ug/L	-	-	<0.50	<0.50	<0.50
Vinyl Chloride	0.50	ug/L	600	-	<0.50	<0.50	<0.50

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**TABLE 11: POLYCHLORINATED BIPHENYLS in Surface Water**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date		
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN (DUP)
					21-Dec-22	21-Dec-22	21-Dec-22
Polychlorinated Biphenyls	0.060	ug/L	0.001	-	<0.060	<0.060	<0.060

**Notes:**

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**Value** Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.

**TABLE 12: GENERAL CHEMISTRY in Surface Water**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date		
			Fresh Water <sup>1</sup>	Marine <sup>2</sup>	SURF-UP	SURF-DOWN	SURF-DOWN (DUP)
					21-Dec-22	21-Dec-22	21-Dec-22
pH	0.1	-	6.5 - 9	7.0 - 8.7	6.58	<b>6.49</b>	6.51
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCL)	9,830	10,100	10,000
Fluoride	20	ug/L	120	1500	<20	<20	<20
Sulphate	300	ug/L	128,000	-	2,210	2,880	2,640
Alkalinity	1000	ug/L	-	-	4,500	4,400	4,200
True Color	2	TCU	-	-	85.3	84.3	86.1
Turbidity	0.1	NTU	-	-	1.42	1.45	1.41
Electrical Conductivity	1	uS/cm	-	-	51.2	52.8	52.5
Nitrate + Nitrite as N	3.2	ug/L	-	-	450	470	470
Nitrate as N	20	ug/L	13,000	200,000	45	47	47
Nitrite as N	10	ug/L	60	-	<10	<10	<10
Ammonia as N	5	ug/L	73.0 (SURF-UP, SURF-DOWN and SURF-DOWN (DUP))	18,400 (SURF-UP, SURF-DOWN and SURF-DOWN (DUP))	<5	24	<5
Ortho-Phosphates as P	1	ug/L	-	-	<1	5	<1
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	5,500	5,400	5,100
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	<1000	<1000	<1000
Hydroxide	1000	ug/L	-	-	<1000	<1000	<1000
Calculated TDS	10	ug/L	-	-	48,000	59,000	60,000
Hardness	0.5	ug/L	-	-	8,380	8,750	9,220
Langelier Index (@20C)	0.01	NA	-	-	-3.72	-3.80	-3.78
Langelier Index (@4C)	0.01	NA	-	-	-3.97	-4.06	-4.03
Saturation pH (@20C)	0.01	NA	-	-	10.3	10.3	10.3
Saturation pH (@4C)	0.01	NA	-	-	10.6	10.5	10.5
Anion Sum	0.1	me/L	-	-	0.42	0.44	0.42
Cation Sum	0.1	me/L	-	-	0.48	0.49	0.59
% Difference / Ion Balance	0.01	%	-	-	114	111	140

**Notes:**

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**Value <sup>A</sup>** Exceeds **Fresh Water** or **Marine** criteria reference below.

**TABLE 13: PETROLEUM HYDROCARBONS in Leachate**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	Atlantic RBCA - Ecological Tier 1 EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	SAMPLE ID and Date		
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS	
						21-Dec-22	21-Dec-22	
BTEX	Benzene	0.00050	mg/L	2.1	2.1	-	<0.00050	<0.00050
	Toluene	0.00050	mg/L	0.770	0.770	-	<0.00050	<0.00050
	Ethylbenzene	0.00050	mg/L	0.320	0.320	-	<0.00050	<0.00050
	Xylenes	0.00050	mg/L	0.330	0.330	-	<0.00050	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>6</sub> -C <sub>10</sub> )	0.025	mg/L	-	-	-	<0.025	<0.025
	Fuel Range (>C <sub>10</sub> -C <sub>16</sub> )	0.050	mg/L	-	-	-	<0.050	0.155
	Fuel Range (>C <sub>16</sub> -C <sub>21</sub> )	0.050	mg/L	-	-	-	<0.050	0.252
	Lube Range (>C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-	-	-	<0.050	0.074
Total Modified TPH	0.090	mg/L	1.5 as gas 0.1 as fuel oil / lube oil		15	<0.090	0.481	
Reached Baseline at C32	-	-	-	-	-	Yes	Yes	
Product Resemblance	none	-	-	-	-	N/A	NR	

**Notes:**

\* Indicates field duplicate.

<sup>1, 2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NR = No Resemblance

- = No applicable guideline or parameter not defined.

Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.

TABLE 14: METALS (TOTAL) in Leachate  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
Aluminum	30	ug/L	5	-	-	18.9	<30
Antimony	0.10	ug/L	9	250	-	<0.10	<1.0
Arsenic	0.10	ug/L	5	12.5	500	0.20	<1.0
Barium	0.10	ug/L	1000	500	5,000	43.1	110
Beryllium	0.020	ug/L	0.15	100	-	<0.02	<0.20
Bismuth	0.050	ug/L	-	-	-	<0.05	<0.50
Boron	10	ug/L	1,500	1,200	5,000	530	1,620
Cadmium	0.005	ug/L	0.09	0.12	50	<0.005	<0.04
Calcium	100	ug/L	-	-	-	60,300	126,000
Cesium	0.01	ug/L	-	-	-	0.050	0.113
Chromium (total)	0.50	ug/L	8.9	56	50	0.59	<2.5
Cobalt	0.10	ug/L	1	4	-	<0.10	<1.0
Copper	0.50	ug/L	2	1	300	1.69	<2.0
Iron	10.00	ug/L	300	-	10,000	360	22,100
Lead	0.05	ug/L	1	2	200	<0.050	<0.50
Lithium	1.00	ug/L	-	-	-	<1.0	<10
Magnesium	0.10	ug/L	-	-	-	6,530	27,600
Manganese	0.10	ug/L	430	-	-	188	7,280
Mercury	0.01	ug/L	0.026	0.016	-	<0.005	0.005
Molybdenum	0.50	ug/L	73	1000	-	0.562	<0.50
Nickel	5	ug/L	25	8.3	500	0.55	<5.0
Phosphorus	50	ug/L	-	-	0.5	<50	<500
Potassium	50	ug/L	-	-	-	5,150	7,470
Rubidium	0.20	ug/L	-	-	-	7.9	15.3
Selenium	0.50	ug/L	1	2	10	0.053	<0.50
Silicon (as SiO <sub>2</sub> )	250	ug/L	-	-	-	9,560	15,600
Silicon	100	ug/L	-	-	-	4,470	7,310
Silver	0.01	ug/L	0.25	1.5	50	<0.01	<0.10
Sodium	50	ug/L	-	-	-	13,100	24,700
Strontium	0.20	ug/L	21,000	0.3	-	160	375
Sulfur	500	ug/L	-	-	-	3,100	<5.0
Tellurium	0.20	ug/L	-	-	-	<0.20	<2.0
Thallium	0.01	ug/L	0.8	0.3	-	<0.01	<0.10
Thorium	0.10	ug/L	-	-	-	<0.10	<1.0
Tin	0.10	ug/L	-	-	-	0.11	<1.0
Titanium	0.30	ug/L	-	-	-	0.57	<3.0
Tungsten	0.10	ug/L	-	-	-	<0.10	<1.0
Uranium	0.01	ug/L	15	8.5	-	0.196	0.331
Vanadium	0.50	ug/L	120	5	-	<0.50	<5.0
Zinc	3	ug/L	7	10	500	<3.0	<7.0
Zirconium	0.20	ug/L	-	-	-	<0.20	<2.0

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

Value	Exceeds Fresh Water and Marine criteria reference below.
Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.



TABLE 15: METALS (Dissolved) in Leachate  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
Aluminum	1	ug/L	5	-	-	9.8	19.8
Antimony	0.1	ug/L	9	250	-	<0.10	<1.0
Arsenic	0.1	ug/L	5	12.5	500	0.20	<1.0
Barium	0.1	ug/L	1000	500	5,000	40	98
Beryllium	0.02	ug/L	0.15	100	-	0.020	<0.20
Bismuth	0.05	ug/L	-	-	-	<0.05	<0.50
Boron	10	ug/L	1,500	1,200	5,000	0.43	1.52
Cadmium	0.005	ug/L	0.09	0.12	50	<0.005	<0.04
Calcium	50	ug/L	-	-	-	55.1	125
Cesium	0.01	ug/L	-	-	-	0.050	0.111
Chromium (total)	0.5	ug/L	8.9	56	50	<0.50	<1.0
Cobalt	0.1	ug/L	1	4	-	<0.1	<1.0
Copper	0.2	ug/L	2	1	300	1.50	<2.0
Iron	10	ug/L	300	-	10,000	393	17,700
Lead	0.05	ug/L	1	2	200	<0.05	<0.5
Lithium	1	ug/L	-	-	-	<1.0	<10
Magnesium	5	ug/L	-	-	-	6,750	24,600
Manganese	0.1	ug/L	430	-	-	176	6,830
Mercury	0.005	ug/L	0.026	0.016	-	0.0052	<0.005
Molybdenum	0.05	ug/L	73	1000	-	0.50	<0.5
Nickel	0.5	ug/L	25	8.3	500	<0.5	<5.0
Phosphorus	50	ug/L	-	-	0.5	<50	<500
Potassium	50	ug/L	-	-	-	500	737
Rubidium	0.2	ug/L	-	-	-	7.38	16
Selenium	0.05	ug/L	1	2	10	0.082	<0.5
Silicon	50	ug/L	-	-	-	4,410	7,390
Silver	0.01	ug/L	0.25	1.5	50	<0.01	<0.1
Sodium	50	ug/L	-	-	-	12,700	24,100
Strontium	0.2	ug/L	21,000	0.3	-	148	345
Sulfur	500	ug/L	-	-	-	3,020	<5,000
Tellurium	0.2	ug/L	-	-	-	<0.2	<2.0
Thallium	0.01	ug/L	0.8	0.3	-	<0.01	<0.1
Thorium	0.1	ug/L	-	-	-	<0.1	<1.0
Tin	0.1	ug/L	-	-	-	0.2	<1.0
Titanium	0.3	ug/L	-	-	-	<0.3	<3.0
Tungsten	0.1	ug/L	-	-	-	<0.1	<1.0
Uranium	0.01	ug/L	15	8.5	-	0.18	0.339
Vanadium	0.05	ug/L	120	5	-	<0.5	<5.0
Zinc	1	ug/L	7	10	500	<1.0	<7.0
Zirconium	0.3	ug/L	-	-	-	<0.3	<3.0

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

3 Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.
Value	RDL exceeds NL 65/03 Schedule A Regulations.

**TABLE 16: POLYCYCLIC AROMATIC HYDROCARBONS in Leachate**  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
1- Methyl naphthalene	0.01	ug/L	2	1	-	<0.010	0.015
2-Methyl naphthalene	0.01	ug/L	2	1	-	<0.010	<0.010
Acenaphthene	0.01	ug/L	5.8	6	-	<0.010	<0.101
Acenaphthylene	0.01	ug/L	-	-	-	<0.010	<0.010
Anthracene	0.01	ug/L	0.012	0.1	-	<0.010	<0.116
Benzo(a)anthracene	0.01	ug/L	0.018	-	-	<0.010	0.042
Benzo(a)pyrene	0.005	ug/L	0.015	0.01	-	<0.0050	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	-	-	-
Benzo(b/j)fluoranthene	0.01	ug/L	-	-	-	<0.010	<0.010
Benzo(g,h,i)perylene	0.01	ug/L	-	-	-	<0.010	<0.010
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	-	<0.010	<0.010
Chrysene	0.01	ug/L	0.1	0.1	-	<0.010	0.054
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	-	<0.0050	<0.0050
Fluoranthene	0.01	ug/L	0.04	0.2	-	<0.010	0.150
Fluorene	0.01	ug/L	3	12	-	<0.010	<0.056
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	-	<0.010	<0.010
Naphthalene	0.01	ug/L	1.1	1.4	-	<0.010	<0.010
Perylene	0.01	ug/L	-	-	-	<0.010	<0.010
Phenanthrene	0.01	ug/L	0.4	0.3	-	<0.010	<0.019
Pyrene	0.01	ug/L	0.025	0.02	-	0.022	0.890

**Notes:**

\* Indicates field duplicate sample.

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

- = No applicable guideline or parameter not defined.

Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.
Value	RDL exceeds NL 65/03 Schedule A Regulations.

TABLE 17: VOLATILE ORGANIC COMPOUNDS in Leachate  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
1,2-Dichlorobenzene	0.50	ug/L	0.7	42	-	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	150	150	-	<0.50	<0.50
1,4-Dichlorobenzene	0.50	ug/L	26	26	-	<0.50	<0.50
Chlorobenzene	0.50	ug/L	1.3	25	-	<0.50	<0.50
1,1,1-Trichloroethane	0.50	ug/L	10	-	-	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	70	-	-	<0.50	<0.50
1,1,2-Trichloroethane	0.50	ug/L	800	-	-	<0.50	<0.50
1,1-Dichloroethane	0.50	ug/L	200	-	-	<0.50	<0.50
1,1-Dichloroethylene	0.50	ug/L	40	-	-	<0.50	<0.50
1,2-Dichloroethane	0.50	ug/L	100	100	-	<0.50	<0.50
1,2-Dichloropropane	0.50	ug/L	0.7	3,040	-	<0.50	<0.50
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	200	6,400	-	<0.50	<0.50
Bromoform (Tribromomethane)	0.50	ug/L	60	6,400	-	<0.50	<0.50
Bromomethane (Methyl bromide)	0.50	ug/L	0.9	6,400	-	<0.50	<0.50
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	13.3	13	-	<0.20	<0.20
Chloroethane (Ethyl chloride)	0.50	ug/L	1,100	-	-	<0.50	<0.50
Chloroform (Trichloromethane)	0.50	ug/L	1.8	2	-	<0.50	<0.50
Chloromethane (Methyl chloride)	2.00	ug/L	700	6,400	-	<2.0	<2.0
cis-1,2-Dichloroethylene	0.50	ug/L	200	-	-	<0.50	<0.50
cis-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.30	<0.30
Dibromochloromethane	0.50	ug/L	40	6,400	-	<0.50	<0.50
Ethylene Dibromide (1,2-Dibromoethane)	0.20	ug/L	5	-	-	<0.20	<0.20
Methylene Chloride (Dichloromethane)	1.00	ug/L	98.1	98	-	<1.0	<1.0
Styrene	0.50	ug/L	72	-	-	<0.50	<0.50
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	110	110	-	<0.50	<0.50
trans-1,2-Dichloroethylene	0.50	ug/L	200	-	-	<0.50	<0.50
trans-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.30	<0.30
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	21	20	-	<0.50	<0.50
Trichlorofluoromethane (Freon 11)	0.50	ug/L	-	-	-	<0.50	<0.50
Vinyl Chloride	0.50	ug/L	600	-	-	<0.50	<0.50

Notes:

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

- = No applicable guideline or parameter not defined.

**TABLE 18: POLYCHLORINATED BIPHENYLS in Leachate**  
 Client: Department of Environment and Climate Change (ECC)  
 Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL  
 Englobe Project No.: 2210292.000

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
Polychlorinated Biphenyls	0.060	ug/L	0.001	-	-	<0.060	<0.060

**Notes:**

Exceeds criteria reference below.

Value

Reportable Detection Limit (RDL) exceeds Fresh Water or Marine criteria reference below.

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

- = No applicable guideline or parameter not defined.

**TABLE 19: GENERAL CHEMISTRY in Leachate**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date	
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
						21-Dec-22	21-Dec-22
pH	0.1	-	6.5 - 9	7.0 - 8.7	5.5 - 9.0	7.80	7.18
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCl)	-	14,600	34,200
Fluoride	20	ug/L	120	1500	-	93	57
Sulphate	300	ug/L	128,000	-	-	8,690	8,460
Alkalinity	1000	ug/L	-	-	-	176,000	434,000
True Color (CU)	2	TCU	-	-	-	60.7	1100
Turbidity (NTU)	0.1	NTU	-	-	-	0.55	206
Electrical Conductivity (uS/cm)	1	uS/cm	-	-	-	399	893
Nitrate + Nitrite as N	3.2	ug/L	-	-	-	381	22
Nitrate as N	20	ug/L	13,000	200,000	10,000	381	<20
Nitrite as N	10	ug/L	60	-	-	<10	<10
Ammonia as N	5	ug/L	-	-	2,000	139	954
Ortho-Phosphates as P	1	ug/L	-	-	-	1.6	<1.0
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	-	214,000	529,000
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	-	<1,000	<1,000
Hydroxide	1000	ug/L	-	-	-	<1,000	<1,000
Calculated TDS (ug/L)	10000	ug/L	-	-	1,000,000	251,000	539,000
Hardness	500	ug/L	-	-	-	177,000	428,000
Langelier Index (@20C)	0.01	NA	-	-	-	0.417	0.440
Langelier Index (@4C)	0.01	NA	-	-	-	0.168	192
Saturation pH (@20C)	0.01	NA	-	-	-	7.38	6.74
Saturation pH (@4C)	0.01	NA	-	-	-	7.63	6.99
Anion Sum (meq/L)	0.1	me/L	-	-	-	4.14	9.82
Cation Sum (meq/L)	0.1	me/L	-	-	-	4.28	10.9
% Difference / Ion Balance	0.01	%	-	-	-	103	111

**Notes:**

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

- = No applicable guideline or parameter not defined.

Value <sup>x</sup>	Exceeds Fresh Water or Marine criteria reference below.
Value <sup>x</sup>	Exceeds NL 65/03 Schedule A Regulations.
Value <sup>x</sup>	Reportable Detection Limit (RDL) exceeds NL 65/03 Schedule A Regu.

**TABLE 20: TOXICOLOGY in Leachate**  
**Client: Department of Environment and Climate Change (ECC)**  
**Site Location: Come By Chance Hazardous Waste Landfill, Come By Chance, NL**  
**Englobe Project No.: 2210292.000**

PARAMETER	Sample ID & Date							
	PLCS				SLCS			
	21-Dec-22				21-Dec-22			
	100		0		100		0	
Effluent Concentration	Initial	Final	Initial	Final	Initial	Final	Initial	Final
<b>Mortality (%)</b>	0	0	0	0	0	0	0	0

**Notes:**

<sup>1</sup> Acute lethality: PASS (mortality: 50% or less), Acute lethality: FAIL (mortality: more than 50%).

- = No applicable guideline or parameter not defined.

# Appendix D

# Laboratory Certificates





## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<p><b>Work Order</b> : HA2200072</p> <p><b>Client</b> : Englobe Corp.</p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : ----</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 6</p> <p><b>No. of samples analysed</b> : 6</p>	<p><b>Page</b> : 1 of 41</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 22-Dec-2022 10:00</p> <p><b>Date Analysis Commenced</b> : 22-Dec-2022</p> <p><b>Issue Date</b> : 05-Jan-2023 16:05</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Metals, Waterloo, Ontario



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
none	none
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
OWP	<i>Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.</i>
RRV	<i>Reported result verified by repeat analysis.</i>



## Analytical Results

				Client sample ID							
				MW10-01							
				21-Dec-2022							
				00:00							
				HA2200072-001							
Analyte	Method	LOR	Unit		ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	73.9	--	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	60.6	--	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	2150	DLM	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	178	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	-1.15	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	-1.40	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	8.26	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	8.51	--	--	--	--	--	--	--
pH	E108	0.10	pH units	7.11	--	--	--	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	129	DLDS	--	--	--	--	--	--
turbidity	E121	0.10	NTU	345	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	0.165	--	--	--	--	--	--	--
chloride	E235.Cl	0.50	mg/L	9.97	RRV	--	2300 mg/L	--	--	--	--
fluoride	E235.F	0.020	mg/L	0.026	--	--	--	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.044	--	--	--	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0440	--	--	--	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010	--	--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	11.6	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	19.6	--	--	--	--	--	--	--
<b>Ion Balance</b>											
anion sum	EC101	0.10	meq/L	1.74	--	--	--	--	--	--	--
cation sum	EC101	0.10	meq/L	1.72	--	--	--	--	--	--	--
ion balance (cations/anions)	EC101	0.010	%	98.8	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
aluminum, dissolved	E421	0.0010	mg/L	0.0496	--	--	--	--	--	--
antimony, dissolved	E421	0.00010	mg/L	0.00011	--	20 mg/L	--	--	--	--
arsenic, dissolved	E421	0.00010	mg/L	0.00096	--	1.9 mg/L	--	--	--	--
barium, dissolved	E421	0.00010	mg/L	0.0264	--	29 mg/L	--	--	--	--
beryllium, dissolved	E421	0.000020	mg/L	0.000024	--	0.067 mg/L	--	--	--	--
bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, dissolved	E421	0.010	mg/L	<0.010	--	45 mg/L	--	--	--	--
cadmium, dissolved	E421	0.0000050	mg/L	0.0000061	--	0.0027 mg/L	--	--	--	--
calcium, dissolved	E421	0.050	mg/L	20.7	--	--	--	--	--	--
cesium, dissolved	E421	0.000010	mg/L	0.000078	--	--	--	--	--	--
chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
cobalt, dissolved	E421	0.00010	mg/L	0.00144	--	0.066 mg/L	--	--	--	--
copper, dissolved	E421	0.00020	mg/L	0.00351	--	0.087 mg/L	--	--	--	--
iron, dissolved	E421	0.010	mg/L	7.24	--	--	--	--	--	--
lead, dissolved	E421	0.000050	mg/L	0.000170	--	0.025 mg/L	--	--	--	--
lithium, dissolved	E421	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, dissolved	E421	0.0050	mg/L	1.27	--	--	--	--	--	--
manganese, dissolved	E421	0.00010	mg/L	0.240	--	--	--	--	--	--
molybdenum, dissolved	E421	0.000050	mg/L	0.00216	--	9.2 mg/L	--	--	--	--
nickel, dissolved	E421	0.00050	mg/L	0.00159	--	0.49 mg/L	--	--	--	--
phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, dissolved	E421	0.050	mg/L	0.634	--	--	--	--	--	--
rubidium, dissolved	E421	0.00020	mg/L	0.00076	--	--	--	--	--	--
selenium, dissolved	E421	0.000050	mg/L	0.000216	--	0.063 mg/L	--	--	--	--
silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	2.74	--	--	--	--	--	--
silicon, dissolved	E421	0.050	mg/L	1.28	--	--	--	--	--	--
silver, dissolved	E421	0.000010	mg/L	0.000032	--	0.0015 mg/L	--	--	--	--
sodium, dissolved	E421	0.050	mg/L	6.58	--	2300 mg/L	--	--	--	--
strontium, dissolved	E421	0.00020	mg/L	0.0489	--	--	--	--	--	--
sulfur, dissolved	E421	0.50	mg/L	1.34	--	--	--	--	--	--
tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
titanium, dissolved	E421	0.00030	mg/L	0.00177	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
tungsten, dissolved	E421	0.00010	mg/L	0.00179	--	--	--	--	--	--
uranium, dissolved	E421	0.000010	mg/L	0.000286	--	0.42 mg/L	--	--	--	--
vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
zinc, dissolved	E421	0.0010	mg/L	0.0023	--	1.1 mg/L	--	--	--	--
zirconium, dissolved	E421	0.00020	mg/L	0.00065	--	--	--	--	--	--
dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	OWP	--	130000 µg/L	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	OWP	--	85000 µg/L	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	OWP	--	380 µg/L	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	OWP	--	5.6 µg/L	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	OWP	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	OWP	--	0.79 µg/L	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	OWP	--	630 µg/L	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	OWP	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	OWP	--	2.4 µg/L	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	OWP	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	OWP	--	82000 µg/L	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	OWP	--	0.25 µg/L	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4600 µg/L	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	OWP	--	9600 µg/L	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	OWP	--	8 µg/L	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	4400 µg/L	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	320 µg/L	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71		--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	OWP	--	610 µg/L	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	5.74	OWP	--	16 µg/L	--	--	--
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	OWP	--	5.2 µg/L	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-001 (Continued)		ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>											
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	OWP	--	51 µg/L	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	OWP	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	OWP	--	470000 µg/L	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	OWP	--	140000 µg/L	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	OWP	--	190 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	OWP	--	1300 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.3 µg/L	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.2 µg/L	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	OWP	20000 µg/L	18000 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	OWP	--	640 µg/L	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4.7 µg/L	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	1.35	OWP	--	1.6 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	2500 µg/L	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	OWP	--	0.5 µg/L	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0		--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>											
C6-C10 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	OWP	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050		20 mg/L	4.2 mg/L	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	OWP	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	OWP	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	OWP	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	107		--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	82.8		--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	98.2		--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025		--	--	--	--	--	--
bromofluorobenzene, 4-	E611D	1.0	%	101		--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	100		--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200072-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	0.010	--	1400 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene-d12	E641A-L	0.1	%	115	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-001 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
naphthalene-d8	E641A-L	0.1	%	105	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	119	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
decachlorobiphenyl	E687	0.1	%	82.9	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	84.6	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |



## Analytical Results

				Client sample ID							
				MW10-01A							
				21-Dec-2022							
				00:00							
				HA2200072-002	ACRBCA	ON153/04					
Analyte	Method	LOR	Unit		CL/IL(C)NPOT[	T3-NPGW-C-AI					
					AI]T1SL	I					
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	93.6	--	--	--	--	--	--	
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	
alkalinity, total (as CaCO3)	E290	1.0	mg/L	76.7	--	--	--	--	--	--	
colour, apparent	E330	2.0	CU	1810	DLM	--	--	--	--	--	
conductivity	E100	1.0	µS/cm	172	--	--	--	--	--	--	
Langelier index (@ 20°C)	EC105	0.010	-	-0.746	--	--	--	--	--	--	
Langelier index (@ 4°C)	EC105	0.010	-	-0.998	--	--	--	--	--	--	
pH, saturation (@ 20°C)	EC105	0.010	pH units	8.14	--	--	--	--	--	--	
pH, saturation (@ 4°C)	EC105	0.010	pH units	8.39	--	--	--	--	--	--	
pH	E108	0.10	pH units	7.39	--	--	--	--	--	--	
solids, total dissolved [TDS]	E162	10	mg/L	144	DLDS	--	--	--	--	--	
turbidity	E121	0.10	NTU	303	--	--	--	--	--	--	
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	0.0139	--	--	--	--	--	--	
chloride	E235.Cl	0.50	mg/L	7.85	--	2300 mg/L	--	--	--	--	
fluoride	E235.F	0.020	mg/L	0.042	--	--	--	--	--	--	
nitrate (as N)	E235.NO3	0.020	mg/L	0.123	--	--	--	--	--	--	
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.123	--	--	--	--	--	--	
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010	--	--	--	--	--	--	
sulfate (as SO4)	E235.SO4	0.30	mg/L	4.41	--	--	--	--	--	--	
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	9.32	--	--	--	--	--	--	
<b>Ion Balance</b>											
anion sum	EC101	0.10	meq/L	1.86	--	--	--	--	--	--	
cation sum	EC101	0.10	meq/L	1.73	--	--	--	--	--	--	
ion balance (cations/anions)	EC101	0.010	%	93.0	--	--	--	--	--	--	



Analyte	Method	LOR	Unit	HA2200072-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
aluminum, dissolved	E421	0.0010	mg/L	0.0112	--	--	--	--	--	--
antimony, dissolved	E421	0.00010	mg/L	0.00022	--	20 mg/L	--	--	--	--
arsenic, dissolved	E421	0.00010	mg/L	0.00034	--	1.9 mg/L	--	--	--	--
barium, dissolved	E421	0.00010	mg/L	0.0296	--	29 mg/L	--	--	--	--
beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	0.067 mg/L	--	--	--	--
bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, dissolved	E421	0.010	mg/L	<0.010	--	45 mg/L	--	--	--	--
cadmium, dissolved	E421	0.0000050	mg/L	0.0000168	--	0.0027 mg/L	--	--	--	--
calcium, dissolved	E421	0.050	mg/L	22.1	--	--	--	--	--	--
cesium, dissolved	E421	0.000010	mg/L	0.000050	--	--	--	--	--	--
chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
cobalt, dissolved	E421	0.00010	mg/L	0.00248	--	0.066 mg/L	--	--	--	--
copper, dissolved	E421	0.00020	mg/L	0.00401	--	0.087 mg/L	--	--	--	--
iron, dissolved	E421	0.010	mg/L	0.067	--	--	--	--	--	--
lead, dissolved	E421	0.000050	mg/L	0.000065	--	0.025 mg/L	--	--	--	--
lithium, dissolved	E421	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, dissolved	E421	0.0050	mg/L	4.18	--	--	--	--	--	--
manganese, dissolved	E421	0.00010	mg/L	0.560	--	--	--	--	--	--
molybdenum, dissolved	E421	0.000050	mg/L	0.000251	--	9.2 mg/L	--	--	--	--
nickel, dissolved	E421	0.00050	mg/L	0.00307	--	0.49 mg/L	--	--	--	--
phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, dissolved	E421	0.050	mg/L	0.834	--	--	--	--	--	--
rubidium, dissolved	E421	0.00020	mg/L	0.00077	--	--	--	--	--	--
selenium, dissolved	E421	0.000050	mg/L	0.000112	--	0.063 mg/L	--	--	--	--
silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	11.2	--	--	--	--	--	--
silicon, dissolved	E421	0.050	mg/L	5.25	--	--	--	--	--	--
silver, dissolved	E421	0.000010	mg/L	0.000014	--	0.0015 mg/L	--	--	--	--
sodium, dissolved	E421	0.050	mg/L	5.45	--	2300 mg/L	--	--	--	--
strontium, dissolved	E421	0.00020	mg/L	0.0588	--	--	--	--	--	--
sulfur, dissolved	E421	0.50	mg/L	3.90	--	--	--	--	--	--
tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, dissolved	E421	0.00010	mg/L	0.00018	--	--	--	--	--	--
titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
tungsten, dissolved	E421	0.00010	mg/L	0.00056	--	--	--	--	--	--
uranium, dissolved	E421	0.000010	mg/L	0.000077	--	0.42 mg/L	--	--	--	--
vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
zinc, dissolved	E421	0.0010	mg/L	0.0038	--	1.1 mg/L	--	--	--	--
zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	OWP	--	130000 µg/L	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	OWP	--	85000 µg/L	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	OWP	--	380 µg/L	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	OWP	--	5.6 µg/L	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	OWP	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	OWP	--	0.79 µg/L	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	OWP	--	630 µg/L	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	OWP	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	OWP	--	2.4 µg/L	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	OWP	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	OWP	--	82000 µg/L	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	OWP	--	0.25 µg/L	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4600 µg/L	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	OWP	--	9600 µg/L	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	OWP	--	8 µg/L	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	4400 µg/L	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	320 µg/L	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71		--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	OWP	--	610 µg/L	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	16 µg/L	--	--	--
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	OWP	--	5.2 µg/L	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200072-002 (Continued)		ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>											
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	OWP	--	51 µg/L	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	OWP	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	OWP	--	470000 µg/L	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	OWP	--	140000 µg/L	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	OWP	--	190 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	OWP	--	1300 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.3 µg/L	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.2 µg/L	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	OWP	20000 µg/L	18000 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	OWP	--	640 µg/L	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4.7 µg/L	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	2500 µg/L	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	OWP	--	0.5 µg/L	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0		--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>											
C6-C10 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	OWP	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050		20 mg/L	4.2 mg/L	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	OWP	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	OWP	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	OWP	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	116		--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	76.6		--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	94.2		--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025		--	--	--	--	--	--
bromofluorobenzene, 4-	E611D	1.0	%	101		--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.8		--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	0.020	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene-d12	E641A-L	0.1	%	115	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-002 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
naphthalene-d8	E641A-L	0.1	%	103	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	121	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
decachlorobiphenyl	E687	0.1	%	77.5	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	73.9	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |



## Analytical Results

				Client sample ID							
				MW10-01(DUP)							
Sub-Matrix: Water (Matrix: Water)				Sampling date/time							
Analyte	Method	LOR	Unit	HA2200072-003	ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	75.2	--	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	61.6	--	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	1830	DLM	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	176	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	-1.00	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	-1.25	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	8.22	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	8.47	--	--	--	--	--	--	--
pH	E108	0.10	pH units	7.22	--	--	--	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	127	DLDS	--	--	--	--	--	--
turbidity	E121	0.10	NTU	267	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	0.0452	--	--	--	--	--	--	--
chloride	E235.Cl	0.50	mg/L	9.56	--	2300 mg/L	--	--	--	--	--
fluoride	E235.F	0.020	mg/L	0.025	--	--	--	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.037	--	--	--	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0370	--	--	--	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010	--	--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	11.5	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	10.4	--	--	--	--	--	--	--
<b>Ion Balance</b>											
anion sum	EC101	0.10	meq/L	1.74	--	--	--	--	--	--	--
cation sum	EC101	0.10	meq/L	1.72	--	--	--	--	--	--	--
ion balance (cations/anions)	EC101	0.010	%	98.8	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
aluminum, dissolved	E421	0.0010	mg/L	0.0154	--	--	--	--	--	--
antimony, dissolved	E421	0.00010	mg/L	0.00022	--	20 mg/L	--	--	--	--
arsenic, dissolved	E421	0.00010	mg/L	0.00036	--	1.9 mg/L	--	--	--	--
barium, dissolved	E421	0.00010	mg/L	0.0310	--	29 mg/L	--	--	--	--
beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	0.067 mg/L	--	--	--	--
bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, dissolved	E421	0.010	mg/L	<0.010	--	45 mg/L	--	--	--	--
cadmium, dissolved	E421	0.0000050	mg/L	0.0000184	--	0.0027 mg/L	--	--	--	--
calcium, dissolved	E421	0.050	mg/L	22.2	--	--	--	--	--	--
cesium, dissolved	E421	0.000010	mg/L	0.000050	--	--	--	--	--	--
chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
cobalt, dissolved	E421	0.00010	mg/L	0.00253	--	0.066 mg/L	--	--	--	--
copper, dissolved	E421	0.00020	mg/L	0.00392	--	0.087 mg/L	--	--	--	--
iron, dissolved	E421	0.010	mg/L	0.048	--	--	--	--	--	--
lead, dissolved	E421	0.000050	mg/L	0.000059	--	0.025 mg/L	--	--	--	--
lithium, dissolved	E421	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, dissolved	E421	0.0050	mg/L	3.92	--	--	--	--	--	--
manganese, dissolved	E421	0.00010	mg/L	0.623	--	--	--	--	--	--
molybdenum, dissolved	E421	0.000050	mg/L	0.000260	--	9.2 mg/L	--	--	--	--
nickel, dissolved	E421	0.00050	mg/L	0.00307	--	0.49 mg/L	--	--	--	--
phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, dissolved	E421	0.050	mg/L	0.792	--	--	--	--	--	--
rubidium, dissolved	E421	0.00020	mg/L	0.00071	--	--	--	--	--	--
selenium, dissolved	E421	0.000050	mg/L	0.000084	--	0.063 mg/L	--	--	--	--
silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	11.2	--	--	--	--	--	--
silicon, dissolved	E421	0.050	mg/L	5.25	--	--	--	--	--	--
silver, dissolved	E421	0.000010	mg/L	0.000010	--	0.0015 mg/L	--	--	--	--
sodium, dissolved	E421	0.050	mg/L	5.60	--	2300 mg/L	--	--	--	--
strontium, dissolved	E421	0.00020	mg/L	0.0605	--	--	--	--	--	--
sulfur, dissolved	E421	0.50	mg/L	3.88	--	--	--	--	--	--
tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, dissolved	E421	0.00010	mg/L	0.00013	--	--	--	--	--	--
titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200072-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
tungsten, dissolved	E421	0.00010	mg/L	0.00053	--	--	--	--	--	--
uranium, dissolved	E421	0.000010	mg/L	0.000076	--	0.42 mg/L	--	--	--	--
vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
zinc, dissolved	E421	0.0010	mg/L	0.0047	--	1.1 mg/L	--	--	--	--
zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	OWP	--	130000 µg/L	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	OWP	--	85000 µg/L	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	OWP	--	380 µg/L	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	OWP	--	5.6 µg/L	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	OWP	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	OWP	--	0.79 µg/L	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	OWP	--	630 µg/L	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	OWP	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	OWP	--	2.4 µg/L	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	OWP	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	OWP	--	82000 µg/L	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	OWP	--	0.25 µg/L	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4600 µg/L	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	OWP	--	9600 µg/L	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	OWP	--	8 µg/L	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	4400 µg/L	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	320 µg/L	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71		--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	OWP	--	610 µg/L	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	5.72	OWP	--	16 µg/L	--	--	--
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	OWP	--	5.2 µg/L	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-003 (Continued)		ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>											
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	OWP	--	51 µg/L	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	OWP	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	OWP	--	470000 µg/L	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	OWP	--	140000 µg/L	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	OWP	--	190 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	OWP	--	1300 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.3 µg/L	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	OWP	--	3.2 µg/L	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	OWP	--	1.6 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	OWP	20000 µg/L	18000 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	OWP	--	640 µg/L	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	OWP	--	4.7 µg/L	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	1.30	OWP	--	1.6 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	OWP	--	2500 µg/L	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	OWP	--	0.5 µg/L	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0		--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>											
C6-C10 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	OWP	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	OWP	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1		--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050		20 mg/L	4.2 mg/L	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	OWP	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	OWP	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	OWP	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	107		--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	76.3		--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	91.9		--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025		--	--	--	--	--	--
bromofluorobenzene, 4-	E611D	1.0	%	102		--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.9		--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene-d12	E641A-L	0.1	%	114	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-003 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
naphthalene-d8	E641A-L	0.1	%	100	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	118	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
decachlorobiphenyl	E687	0.1	%	99.6	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	86.0	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |



## Analytical Results

Analyte	Method	LOR	Unit	Client sample ID							
				Sampling date/time	SURF-UP	BCCSR 17	CCME	CCME			
Sub-Matrix: Water (Matrix: Water)				HA2200072-004	21-Dec-2022 00:00	FAL	FAL-LT	FAL-ST			
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	5.5	--	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	4.5	--	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	85.3	--	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	51.2	--	--	--	--	--	--	--
hardness (as CaCO3), from total Ca/Mg	EC100A	0.50	mg/L	8.38	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105A	0.010	-	-3.72	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105A	0.010	-	-3.97	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105A	0.010	pH units	10.3	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105A	0.010	pH units	10.6	--	--	--	--	--	--	--
pH	E108	0.10	pH units	6.58	--	6.5 - 9 pH units	--	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	48	DLDS	--	--	--	--	--	--
turbidity	E121	0.10	NTU	1.42	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	<0.0050		1.31 mg/L	--	--	--	--	--
chloride	E235.Cl	0.50	mg/L	9.83		1500 mg/L	120 mg/L	--	--	--	--
fluoride	E235.F	0.020	mg/L	<0.020		2 mg/L	0.12 mg/L	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.045		400 mg/L	3 mg/L	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0450		400 mg/L	--	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010		0.2 mg/L	0.06 mg/L	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010		--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	2.21		--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	11.8		--	--	--	--	--	--
<b>Ion Balance</b>											
anion sum	EC101A	0.10	meq/L	0.42		--	--	--	--	--	--
cation sum (total)	EC101A	0.10	meq/L	0.48		--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200072-004 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Ion Balance - Continued</b>										
ion balance (cations/anions)	EC101A	0.01	%	114	--	--	--	--	--	--
<b>Total Metals</b>										
aluminum, total	E420	0.0030	mg/L	0.150	--	0.005 mg/L	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.00010	0.09 mg/L	--	--	--	--	--
arsenic, total	E420	0.00010	mg/L	0.00022	0.05 mg/L	0.005 mg/L	--	--	--	--
barium, total	E420	0.00010	mg/L	0.00649	10 mg/L	--	--	--	--	--
beryllium, total	E420	0.000020	mg/L	<0.000020	0.0015 mg/L	--	--	--	--	--
bismuth, total	E420	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, total	E420	0.010	mg/L	<0.010	12 mg/L	--	--	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.0000050	0.0005 mg/L	4E-05 mg/L	--	--	--	--
calcium, total	E420	0.100	mg/L	2.26	--	--	--	--	--	--
cesium, total	E420	0.000010	mg/L	0.000015	--	--	--	--	--	--
chromium, total	E420	0.00050	mg/L	<0.00050	0.01 mg/L	0.001 mg/L	--	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.00010	0.04 mg/L	--	--	--	--	--
copper, total	E420	0.00050	mg/L	0.00050	0.02 mg/L	0.002 mg/L	--	--	--	--
iron, total	E420	0.010	mg/L	0.437	--	0.3 mg/L	--	--	--	--
lead, total	E420	0.000050	mg/L	0.000183	0.04 mg/L	0.001 mg/L	--	--	--	--
lithium, total	E420	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, total	E420	0.0050	mg/L	0.666	--	--	--	--	--	--
manganese, total	E420	0.00010	mg/L	0.0248	--	0.2 mg/L	2 mg/L	--	--	--
molybdenum, total	E420	0.000050	mg/L	0.000057	10 mg/L	0.073 mg/L	--	--	--	--
nickel, total	E420	0.00050	mg/L	0.00063	0.25 mg/L	0.025 mg/L	--	--	--	--
phosphorus, total	E420	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, total	E420	0.050	mg/L	0.256	--	--	--	--	--	--
rubidium, total	E420	0.00020	mg/L	0.00038	--	--	--	--	--	--
selenium, total	E420	0.000050	mg/L	0.000069	0.02 mg/L	0.001 mg/L	--	--	--	--
silicon (as SiO2), total	EC420.SiO2	0.25	mg/L	2.35	--	--	--	--	--	--
silicon, total	E420	0.10	mg/L	1.10	--	--	--	--	--	--
silver, total	E420	0.000010	mg/L	<0.000010	0.0005 mg/L	0.00025 mg/L	--	--	--	--
sodium, total	E420	0.050	mg/L	6.31	--	--	--	--	--	--
strontium, total	E420	0.00020	mg/L	0.00894	--	--	--	--	--	--
sulfur, total	E420	0.50	mg/L	0.58	--	--	--	--	--	--
tellurium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, total	E420	0.000010	mg/L	<0.000010	0.003 mg/L	0.0008 mg/L	--	--	--	--
thorium, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-004 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Total Metals - Continued</b>										
titanium, total	E420	0.00030	mg/L	0.00330	1 mg/L	--	--	--	--	--
tungsten, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
uranium, total	E420	0.000010	mg/L	0.000012	0.085 mg/L	--	--	--	--	--
vanadium, total	E420	0.00050	mg/L	0.00104	--	--	--	--	--	--
zinc, total	E420	0.0030	mg/L	<0.0030	<b>0.075 mg/L</b>	<b>0.007 mg/L</b>	<b>0.037 mg/L</b>	--	--	--
zirconium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
<b>Speciated Metals</b>										
chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	--	--	--	--
chromium, trivalent [Cr III], total	EC535	0.00050	mg/L	<0.00050	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	--	--	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	130 µg/L	13.3 µg/L	--	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	13 µg/L	1.3 µg/L	--	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	20 µg/L	1.8 µg/L	--	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	--	--	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	7 µg/L	0.7 µg/L	--	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	1500 µg/L	150 µg/L	--	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	260 µg/L	26 µg/L	--	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	1000 µg/L	100 µg/L	--	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	980 µg/L	98.1 µg/L	--	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-004 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds - Continued</b>										
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	34000 µg/L	10000 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	720 µg/L	72 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	1100 µg/L	111 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	5 µg/L	2 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	200 µg/L	21 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	0.4 mg/L	0.37 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	0.005 mg/L	0.002 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	2 mg/L	0.09 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050	0.3 mg/L	--	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	111	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	78.9	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	98.9	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-004 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds Surrogates - Continued</b>										
bromofluorobenzene, 4-	E611D	1.0	%	98.5	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.7	--	--	--	--	--	--
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	--	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	60 µg/L	5.8 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	0.5 µg/L	4.4 µg/L	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.012 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.018 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	0.1 µg/L	0.015 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	1 µg/L	--	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	--	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	2 µg/L	0.04 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	120 µg/L	3 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	10 µg/L	1.1 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	3 µg/L	0.4 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	0.2 µg/L	0.025 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	34 µg/L	3.4 µg/L	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-004 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
chrysene-d12	E641A-L	0.1	%	116	--	--	--	--	--	--
naphthalene-d8	E641A-L	0.1	%	100	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	118	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	--	--	--	--	--
decachlorobiphenyl	E687	0.1	%	100	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	94.1	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
SURF-UP	Water	aluminum, total		CCME	FAL-LT	0.150 mg/L	0.005 mg/L
	Water	iron, total		CCME	FAL-LT	0.437 mg/L	0.3 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2200072-004	SURF-UP	N/A: Not Applicable (mTPH < LOR)



**Key:**

BCCSR 17	British Columbia Contaminated Sites Regulation Stage 13 Amendment (JAN, 2021)
FAL	3.2 Freshwater Aquatic Life
CCME	Canada CCME Canadian Environmental Quality Guidelines (SEP, 2021)
FAL-LT	Freshwater Aquatic Life (Long Term)
FAL-ST	Freshwater Aquatic Life (Short Term)





## Analytical Results

Sub-Matrix: Water (Matrix: Water)		Client sample ID Sampling date/time		SURF-DOWN						
Analyte	Method	LOR	Unit	HA2200072-005	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Physical Tests</b>										
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	5.4	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	4.4	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	84.3	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	52.8	--	--	--	--	--	--
hardness (as CaCO3), from total Ca/Mg	EC100A	0.50	mg/L	8.75	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105A	0.010	-	-3.80	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105A	0.010	-	-4.06	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105A	0.010	pH units	10.3	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105A	0.010	pH units	10.5	--	--	--	--	--	--
pH	E108	0.10	pH units	6.49	--	6.5 - 9 pH units	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	59	DLDS	--	--	--	--	--
turbidity	E121	0.10	NTU	1.45	--	--	--	--	--	--
<b>Anions and Nutrients</b>										
ammonia, total (as N)	E298	0.0050	mg/L	0.0238	1.31 mg/L	--	--	--	--	--
chloride	E235.Cl	0.50	mg/L	10.1	1500 mg/L	120 mg/L	--	--	--	--
fluoride	E235.F	0.020	mg/L	<0.020	2 mg/L	0.12 mg/L	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.047	400 mg/L	3 mg/L	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0470	400 mg/L	--	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	0.2 mg/L	0.06 mg/L	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	0.0047	--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	2.88	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	15.0	--	--	--	--	--	--
<b>Ion Balance</b>										
anion sum	EC101A	0.10	meq/L	0.44	--	--	--	--	--	--
cation sum (total)	EC101A	0.10	meq/L	0.49	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-005 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Ion Balance - Continued</b>										
ion balance (cations/anions)	EC101A	0.01	%	111	--	--	--	--	--	--
<b>Total Metals</b>										
aluminum, total	E420	0.0030	mg/L	0.151	--	0.005 mg/L	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.00010	0.09 mg/L	--	--	--	--	--
arsenic, total	E420	0.00010	mg/L	0.00021	0.05 mg/L	0.005 mg/L	--	--	--	--
barium, total	E420	0.00010	mg/L	0.00626	10 mg/L	--	--	--	--	--
beryllium, total	E420	0.000020	mg/L	<0.000020	0.0015 mg/L	--	--	--	--	--
bismuth, total	E420	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, total	E420	0.010	mg/L	<0.010	12 mg/L	--	--	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.0000050	0.0005 mg/L	4E-05 mg/L	--	--	--	--
calcium, total	E420	0.100	mg/L	2.39	--	--	--	--	--	--
cesium, total	E420	0.000010	mg/L	0.000011	--	--	--	--	--	--
chromium, total	E420	0.00050	mg/L	<0.00050	0.01 mg/L	0.001 mg/L	--	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.00010	0.04 mg/L	--	--	--	--	--
copper, total	E420	0.00050	mg/L	<0.00050	0.02 mg/L	0.002 mg/L	--	--	--	--
iron, total	E420	0.010	mg/L	0.411	--	0.3 mg/L	--	--	--	--
lead, total	E420	0.000050	mg/L	0.000146	0.04 mg/L	0.001 mg/L	--	--	--	--
lithium, total	E420	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, total	E420	0.0050	mg/L	0.676	--	--	--	--	--	--
manganese, total	E420	0.00010	mg/L	0.0299	--	0.2 mg/L	2 mg/L	--	--	--
molybdenum, total	E420	0.000050	mg/L	0.000057	10 mg/L	0.073 mg/L	--	--	--	--
nickel, total	E420	0.00050	mg/L	0.00065	0.25 mg/L	0.025 mg/L	--	--	--	--
phosphorus, total	E420	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, total	E420	0.050	mg/L	0.250	--	--	--	--	--	--
rubidium, total	E420	0.00020	mg/L	0.00034	--	--	--	--	--	--
selenium, total	E420	0.000050	mg/L	0.000056	0.02 mg/L	0.001 mg/L	--	--	--	--
silicon (as SiO2), total	EC420.SiO2	0.25	mg/L	2.35	--	--	--	--	--	--
silicon, total	E420	0.10	mg/L	1.10	--	--	--	--	--	--
silver, total	E420	0.000010	mg/L	<0.000010	0.0005 mg/L	0.00025 mg/L	--	--	--	--
sodium, total	E420	0.050	mg/L	6.34	--	--	--	--	--	--
strontium, total	E420	0.00020	mg/L	0.00916	--	--	--	--	--	--
sulfur, total	E420	0.50	mg/L	0.74	--	--	--	--	--	--
tellurium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, total	E420	0.000010	mg/L	<0.000010	0.003 mg/L	0.0008 mg/L	--	--	--	--
thorium, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-005 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Total Metals - Continued</b>										
titanium, total	E420	0.00030	mg/L	0.00235	1 mg/L	--	--	--	--	--
tungsten, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
uranium, total	E420	0.000010	mg/L	0.000012	0.085 mg/L	--	--	--	--	--
vanadium, total	E420	0.00050	mg/L	0.00095	--	--	--	--	--	--
zinc, total	E420	0.0030	mg/L	<0.0030	<b>0.075 mg/L</b>	<b>0.007 mg/L</b>	<b>0.037 mg/L</b>	--	--	--
zirconium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
<b>Speciated Metals</b>										
chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	--	--	--	--
chromium, trivalent [Cr III], total	EC535	0.00050	mg/L	<0.00050	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	--	--	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	130 µg/L	13.3 µg/L	--	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	13 µg/L	1.3 µg/L	--	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	20 µg/L	1.8 µg/L	--	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	--	--	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	7 µg/L	0.7 µg/L	--	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	1500 µg/L	150 µg/L	--	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	260 µg/L	26 µg/L	--	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	1000 µg/L	100 µg/L	--	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	980 µg/L	98.1 µg/L	--	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-005 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds - Continued</b>										
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	34000 µg/L	10000 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	720 µg/L	72 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	1100 µg/L	111 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	5 µg/L	2 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	200 µg/L	21 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	0.4 mg/L	0.37 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	0.005 mg/L	0.002 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	2 mg/L	0.09 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050	0.3 mg/L	--	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	109	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	81.8	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	102	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-005 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds Surrogates - Continued</b>										
bromofluorobenzene, 4-	E611D	1.0	%	102	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	100	--	--	--	--	--	--
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	--	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	60 µg/L	5.8 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	0.5 µg/L	4.4 µg/L	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.012 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.018 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	0.1 µg/L	0.015 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	1 µg/L	--	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	--	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	2 µg/L	0.04 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	120 µg/L	3 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	10 µg/L	1.1 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	3 µg/L	0.4 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	0.2 µg/L	0.025 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	34 µg/L	3.4 µg/L	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-005 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
chrysene-d12	E641A-L	0.1	%	114	--	--	--	--	--	--
naphthalene-d8	E641A-L	0.1	%	98.2	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	115	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	--	--	--	--	--
decachlorobiphenyl	E687	0.1	%	103	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	89.4	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
SURF-DOWN	Water	pH		CCME	FAL-LT	6.49 pH units	6.5-9 pH units
	Water	aluminum, total		CCME	FAL-LT	0.151 mg/L	0.005 mg/L
	Water	iron, total		CCME	FAL-LT	0.411 mg/L	0.3 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2200072-005	SURF-DOWN	N/A: Not Applicable (mTPH < LOR)





**Key:**

BCCSR 17	British Columbia Contaminated Sites Regulation Stage 13 Amendment (JAN, 2021)
FAL	3.2 Freshwater Aquatic Life
CCME	Canada CCME Canadian Environmental Quality Guidelines (SEP, 2021)
FAL-LT	Freshwater Aquatic Life (Long Term)
FAL-ST	Freshwater Aquatic Life (Short Term)



## Analytical Results

Analyte	Method	LOR	Unit	Client sample ID							
				Sampling date/time	SURF-DOWN(DUP)	BCCSR 17	CCME	CCME			
Sub-Matrix: Water (Matrix: Water)				HA2200072-006	21-Dec-2022 00:00	FAL	FAL-LT	FAL-ST			
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	5.1	--	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	4.2	--	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	86.1	--	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	52.5	--	--	--	--	--	--	--
hardness (as CaCO3), from total Ca/Mg	EC100A	0.50	mg/L	9.22	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105A	0.010	-	-3.78	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105A	0.010	-	-4.03	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105A	0.010	pH units	10.3	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105A	0.010	pH units	10.5	--	--	--	--	--	--	--
pH	E108	0.10	pH units	6.51	--	6.5 - 9 pH units	--	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	60	DLDS	--	--	--	--	--	--
turbidity	E121	0.10	NTU	1.41	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	<0.0050		1.31 mg/L	--	--	--	--	--
chloride	E235.Cl	0.50	mg/L	10.0		1500 mg/L	120 mg/L	--	--	--	--
fluoride	E235.F	0.020	mg/L	<0.020		2 mg/L	0.12 mg/L	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.047		400 mg/L	3 mg/L	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0470		400 mg/L	--	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010		0.2 mg/L	0.06 mg/L	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010		--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	2.64		--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	11.6		--	--	--	--	--	--
<b>Ion Balance</b>											
anion sum	EC101A	0.10	meq/L	0.42		--	--	--	--	--	--
cation sum (total)	EC101A	0.10	meq/L	0.59		--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-006 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Ion Balance - Continued</b>										
ion balance (cations/anions)	EC101A	0.01	%	140	--	--	--	--	--	--
<b>Total Metals</b>										
aluminum, total	E420	0.0030	mg/L	0.156	--	0.005 mg/L	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.00010	0.09 mg/L	--	--	--	--	--
arsenic, total	E420	0.00010	mg/L	0.00020	0.05 mg/L	0.005 mg/L	--	--	--	--
barium, total	E420	0.00010	mg/L	0.00654	10 mg/L	--	--	--	--	--
beryllium, total	E420	0.000020	mg/L	<0.000020	0.0015 mg/L	--	--	--	--	--
bismuth, total	E420	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, total	E420	0.010	mg/L	<0.010	12 mg/L	--	--	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.0000050	0.0005 mg/L	4E-05 mg/L	--	--	--	--
calcium, total	E420	0.100	mg/L	2.56	--	--	--	--	--	--
cesium, total	E420	0.000010	mg/L	0.000013	--	--	--	--	--	--
chromium, total	E420	0.00050	mg/L	0.00051	0.01 mg/L	0.001 mg/L	--	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.00010	0.04 mg/L	--	--	--	--	--
copper, total	E420	0.00050	mg/L	0.00053	0.02 mg/L	0.002 mg/L	--	--	--	--
iron, total	E420	0.010	mg/L	0.421	--	0.3 mg/L	--	--	--	--
lead, total	E420	0.000050	mg/L	0.000156	0.04 mg/L	0.001 mg/L	--	--	--	--
lithium, total	E420	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, total	E420	0.0050	mg/L	0.686	--	--	--	--	--	--
manganese, total	E420	0.00010	mg/L	0.0317	--	0.2 mg/L	2 mg/L	--	--	--
molybdenum, total	E420	0.000050	mg/L	0.000054	10 mg/L	0.073 mg/L	--	--	--	--
nickel, total	E420	0.00050	mg/L	0.00070	0.25 mg/L	0.025 mg/L	--	--	--	--
phosphorus, total	E420	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, total	E420	0.050	mg/L	0.257	--	--	--	--	--	--
rubidium, total	E420	0.00020	mg/L	0.00037	--	--	--	--	--	--
selenium, total	E420	0.000050	mg/L	0.000058	0.02 mg/L	0.001 mg/L	--	--	--	--
silicon (as SiO2), total	EC420.SiO2	0.25	mg/L	2.31	--	--	--	--	--	--
silicon, total	E420	0.10	mg/L	1.08	--	--	--	--	--	--
silver, total	E420	0.000010	mg/L	<0.000010	0.0005 mg/L	0.00025 mg/L	--	--	--	--
sodium, total	E420	0.050	mg/L	8.45	--	--	--	--	--	--
strontium, total	E420	0.00020	mg/L	0.00925	--	--	--	--	--	--
sulfur, total	E420	0.50	mg/L	3.33	--	--	--	--	--	--
tellurium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, total	E420	0.000010	mg/L	<0.000010	0.003 mg/L	0.0008 mg/L	--	--	--	--
thorium, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-006 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Total Metals - Continued</b>										
titanium, total	E420	0.00030	mg/L	0.00256	1 mg/L	--	--	--	--	--
tungsten, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
uranium, total	E420	0.000010	mg/L	0.000014	0.085 mg/L	--	--	--	--	--
vanadium, total	E420	0.00050	mg/L	0.00100	--	--	--	--	--	--
zinc, total	E420	0.0030	mg/L	<0.0030	<b>0.075 mg/L</b>	<b>0.007 mg/L</b>	<b>0.037 mg/L</b>	--	--	--
zirconium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
<b>Speciated Metals</b>										
chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	--	--	--	--
chromium, trivalent [Cr III], total	EC535	0.00050	mg/L	0.00051	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	--	--	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	130 µg/L	13.3 µg/L	--	--	--	--
chlorobenzene	E611D	0.50	µg/L	<0.50	13 µg/L	1.3 µg/L	--	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	20 µg/L	1.8 µg/L	--	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	--	--	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	7 µg/L	0.7 µg/L	--	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	1500 µg/L	150 µg/L	--	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	260 µg/L	26 µg/L	--	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	1000 µg/L	100 µg/L	--	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	980 µg/L	98.1 µg/L	--	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-006 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds - Continued</b>										
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	34000 µg/L	10000 µg/L	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	720 µg/L	72 µg/L	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	1100 µg/L	111 µg/L	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	5 µg/L	2 µg/L	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	200 µg/L	21 µg/L	--	--	--	--
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	0.4 mg/L	0.37 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	0.005 mg/L	0.002 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	2 mg/L	0.09 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050	0.3 mg/L	--	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	104	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	68.8	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	102	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200072-006 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Volatile Organic Compounds Surrogates - Continued</b>										
bromofluorobenzene, 4-	E611D	1.0	%	100	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.6	--	--	--	--	--	--
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	--	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	60 µg/L	5.8 µg/L	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.010	0.5 µg/L	4.4 µg/L	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.012 µg/L	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	1 µg/L	0.018 µg/L	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	0.1 µg/L	0.015 µg/L	--	--	--	--
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	1 µg/L	--	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	--	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	2 µg/L	0.04 µg/L	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	120 µg/L	3 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	10 µg/L	1.1 µg/L	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	3 µg/L	0.4 µg/L	--	--	--	--
pyrene	E641A-L	0.010	µg/L	<0.010	0.2 µg/L	0.025 µg/L	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.010	34 µg/L	3.4 µg/L	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200072-006 (Continued)	BCCSR 17 FAL	CCME FAL-LT	CCME FAL-ST			
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
chrysene-d12	E641A-L	0.1	%	119	--	--	--	--	--	--
naphthalene-d8	E641A-L	0.1	%	102	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	121	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	--	--	--	--	--
decachlorobiphenyl	E687	0.1	%	82.2	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	81.8	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
SURF-DOWN(DUP)	Water	aluminum, total		CCME	FAL-LT	0.156 mg/L	0.005 mg/L
	Water	iron, total		CCME	FAL-LT	0.421 mg/L	0.3 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2200072-006	SURF-DOWN(DUP)	N/A: Not Applicable (mTPH < LOR)



**Key:**

BCCSR 17	British Columbia Contaminated Sites Regulation Stage 13 Amendment (JAN, 2021)
FAL	3.2 Freshwater Aquatic Life
CCME	Canada CCME Canadian Environmental Quality Guidelines (SEP, 2021)
FAL-LT	Freshwater Aquatic Life (Long Term)
FAL-ST	Freshwater Aquatic Life (Short Term)

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: HA2200072</b>	<b>Page</b>	: 1 of 24
<b>Client</b>	: Englobe Corp.	<b>Laboratory</b>	: Halifax - Environmental
<b>Contact</b>	: Mike Smith	<b>Account Manager</b>	: Emily Smith
<b>Address</b>	: Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9	<b>Address</b>	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
<b>Telephone</b>	:	<b>Telephone</b>	: +1 902 483 5298
<b>Project</b>	: 2210292.000	<b>Date Samples Received</b>	: 22-Dec-2022 10:00
<b>PO</b>	: ----	<b>Date Analysis Commenced</b>	: 22-Dec-2022
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 05-Jan-2023 16:03
<b>Sampler</b>	: ----                   709-576-8148		
<b>Site</b>	: ----		
<b>Quote number</b>	: Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills		
<b>No. of samples received</b>	: 6		
<b>No. of samples analysed</b>	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Waterloo Metals, Waterloo, Ontario

Page : 2 of 24  
Work Order : HA2200072  
Client : Englobe Corp.  
Project : 2210292.000



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 787360)</b>											
HA2200072-001	MW10-01	pH	----	E108	0.10	pH units	7.11	7.12	0.140%	4%	----
<b>Physical Tests (QC Lot: 787361)</b>											
HA2200072-001	MW10-01	conductivity	----	E100	1.0	µS/cm	178	177	0.844%	10%	----
<b>Physical Tests (QC Lot: 787362)</b>											
HA2200072-001	MW10-01	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	60.6	65.1	7.25%	20%	----
<b>Physical Tests (QC Lot: 787797)</b>											
HA2200072-001	MW10-01	colour, apparent	----	E330	20.0	CU	2150	2170	0.810%	20%	----
<b>Physical Tests (QC Lot: 788162)</b>											
HA2200072-001	MW10-01	turbidity	----	E121	0.10	NTU	345	343	0.582%	15%	----
<b>Physical Tests (QC Lot: 789399)</b>											
HA2200073-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	251	247	1.81%	20%	----
<b>Anions and Nutrients (QC Lot: 787355)</b>											
HA2200072-001	MW10-01	fluoride	16984-48-8	E235.F	0.020	mg/L	0.026	0.023	0.002	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787356)</b>											
HA2200072-001	MW10-01	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.044	0.042	0.002	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787357)</b>											
HA2200072-001	MW10-01	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787358)</b>											
HA2200072-001	MW10-01	chloride	16887-00-6	E235.Cl	0.50	mg/L	9.97	9.90	0.679%	20%	----
<b>Anions and Nutrients (QC Lot: 787359)</b>											
HA2200072-001	MW10-01	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	11.6	11.5	0.434%	20%	----
<b>Anions and Nutrients (QC Lot: 787587)</b>											
HA2200072-001	MW10-01	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 788284)</b>											
HA2200072-001	MW10-01	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.165	0.160	2.64%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 789201)</b>											
HA2200069-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	0.54	0.04	Diff <2x LOR	----
<b>Total Metals (QC Lot: 788597)</b>											
WT2225891-009	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Metals (QC Lot: 788597) - continued</b>											
WT2225891-009	Anonymous	arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00145	0.00145	0.138%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.287	0.285	0.471%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.021	0.021	0.0005	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000145	0.0000150	0.0000005	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	105	102	3.52%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.000050	mg/L	0.00059	0.00056	0.00003	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	2.30	2.31	0.449%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000188	0.000190	0.000003	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0036	0.0032	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	24.9	25.1	0.690%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0567	0.0563	0.756%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000792	0.000776	2.10%	20%	----
		nickel, total	7440-02-0	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	12.4	12.4	0.409%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00104	0.00103	0.000010	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	5.71	5.92	3.52%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	26.2	26.1	0.416%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.434	0.444	2.17%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	12.7	12.6	0.786%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000647	0.000644	0.480%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Metals (QC Lot: 788597) - continued</b>											
WT2225891-009	Anonymous	vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0084	0.0084	0.00002	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 787811)</b>											
WT2225934-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0018	0.0016	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00029	0.00028	0.00002	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.109	0.111	1.96%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.211	0.212	0.471%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	150	152	1.02%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00072	0.00072	0.000006	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00100	0.00098	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.015	0.015	0.00001	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000084	0.000074	0.000010	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	0.0010	0.00004	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.4	11.7	2.22%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.455	0.454	0.316%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000062	0.000057	0.000004	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00204	0.00204	0.000008	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	9.12	9.08	0.409%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00031	0.00032	0.000004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	0.000060	0.000010	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.60	3.56	1.08%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	115	114	0.893%	20%	----		
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.416	0.415	0.230%	20%	----		
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.6	10.2	3.60%	20%	----		
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----		





Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Dissolved Metals (QC Lot: 787811) - continued</b>											
WT2225934-001	Anonymous	thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000523	0.000522	0.153%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 789161)</b>											
HA2200072-004	SURF-UP	chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 788079)</b>											
HA2200073-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 788080)</b>											
HA2200073-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611D	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 788080) - continued</b>											
HA2200073-001	Anonymous	dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Hydrocarbons (QC Lot: 788078)</b>											
HA2200073-001	Anonymous	VPH C6-C10	n/a	E581.VPH	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 787361)</b>						
conductivity	---	E100	1	µS/cm	<1.0	---
<b>Physical Tests (QCLot: 787362)</b>						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLot: 787797)</b>						
colour, apparent	---	E330	2	CU	<2.0	---
<b>Physical Tests (QCLot: 788162)</b>						
turbidity	---	E121	0.1	NTU	<0.10	---
<b>Physical Tests (QCLot: 789399)</b>						
solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Anions and Nutrients (QCLot: 787355)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 787356)</b>						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 787357)</b>						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 787358)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 787359)</b>						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 787587)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 788284)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 788597)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>						
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 787811)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>						
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>						
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Speciated Metals (QCLot: 789161)</b>						
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	----
chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
chloromethane	74-87-3	E611D	2	µg/L	<2.0	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>						
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
hexanone, 2-	591-78-6	E611D	20	µg/L	<20	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	<0.50	----
<b>Hydrocarbons (QCLot: 788078)</b>						
VPH C6-C10	n/a	E581.VPH	25	µg/L	<25	----
<b>Hydrocarbons (QCLot: 789756)</b>						
EPH >C10-C16	n/a	E601F	50	µg/L	<50	----
EPH >C16-C21	n/a	E601F	50	µg/L	<50	----
EPH >C21-C32	n/a	E601F	50	µg/L	<50	----
EPH >C34-C50	n/a	E601F	100	µg/L	<100	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 788544)</b>						
acenaphthene	83-32-9	E641A-L	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A-L	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A-L	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A-L	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A-L	0.01	µg/L	<0.010	----





Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 788544) - continued</b>						
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A-L	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A-L	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A-L	0.01	µg/L	<0.010	----
perylene	198-55-0	E641A-L	0.01	µg/L	<0.010	----
phenanthrene	85-01-8	E641A-L	0.01	µg/L	<0.010	----
pyrene	129-00-0	E641A-L	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A-L	0.01	µg/L	<0.010	----
<b>Polychlorinated Biphenyls (QCLot: 790062)</b>						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Physical Tests (QCLot: 787360)</b>									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
<b>Physical Tests (QCLot: 787361)</b>									
conductivity	----	E100	1	µS/cm	1409 µS/cm	103	90.0	110	----
<b>Physical Tests (QCLot: 787362)</b>									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	103	85.0	115	----
<b>Physical Tests (QCLot: 787797)</b>									
colour, apparent	----	E330	2	CU	25 CU	105	70.0	130	----
<b>Physical Tests (QCLot: 788162)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	95.4	85.0	115	----
<b>Physical Tests (QCLot: 789399)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.3	85.0	115	----
<b>Anions and Nutrients (QCLot: 787355)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	106	90.0	110	----
<b>Anions and Nutrients (QCLot: 787356)</b>									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100.0	90.0	110	----
<b>Anions and Nutrients (QCLot: 787357)</b>									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
<b>Anions and Nutrients (QCLot: 787358)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 787359)</b>									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.5	90.0	110	----
<b>Anions and Nutrients (QCLot: 787587)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.0212 mg/L	103	80.0	120	----
<b>Anions and Nutrients (QCLot: 788284)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	108	85.0	115	----
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
<b>Total Metals (QCLot: 788597)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	107	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>									
antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	114	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.0125 mg/L	112	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	101	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	108	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	98.3	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.0025 mg/L	110	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	108	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	108	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	106	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	109	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	109	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.0125 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	110	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	107	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	104	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	107	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	111	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	113	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	113	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	106	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	101	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	111	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.0125 mg/L	112	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	99.5	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	106	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	110	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	106	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	105	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	106	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	108	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.00025 mg/L	112	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	109	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>									
zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	120	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	105	80.0	120	----
<b>Dissolved Metals (QCLot: 787811)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	108	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	99.4	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	95.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	93.6	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	99.7	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	104	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	101	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	102	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	90.5	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	117	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	99.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	101	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	107	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	104	60.0	140	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	90.7	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	112	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	97.3	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	100	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>									
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	102	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	98.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	106	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	104	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	99.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	94.7	80.0	120	----
<b>Speciated Metals (QCLot: 789161)</b>									
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	96.2	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	91.9	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	95.3	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	95.3	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	94.8	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	93.9	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	110	70.0	130	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	95.4	70.0	130	----
bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	87.0	70.0	130	----
bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	104	60.0	140	----
carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	108	70.0	130	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	101	70.0	130	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	91.7	70.0	130	----
chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	100	60.0	140	----
chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	94.2	70.0	130	----
chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	101	60.0	140	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	91.7	70.0	130	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	97.1	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	92.4	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	95.7	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	95.2	70.0	130	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	94.4	60.0	140	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	98.6	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	92.9	70.0	130	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>									
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	93.0	70.0	130	----
dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	104	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	93.8	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	92.9	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	95.6	70.0	130	----
hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	93.6	70.0	130	----
hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	84.5	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	98.4	70.0	130	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	89.5	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	97.9	70.0	130	----
styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	94.6	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	92.5	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	84.3	70.0	130	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	99.0	70.0	130	----
toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	95.3	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	96.9	70.0	130	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	98.6	70.0	130	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	107	60.0	140	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	100 µg/L	100	60.0	140	----
<b>Hydrocarbons (QCLot: 788078)</b>									
VPH C6-C10	n/a	E581.VPH	25	µg/L	2000 µg/L	110	80.0	120	----
<b>Hydrocarbons (QCLot: 789756)</b>									
EPH >C10-C16	n/a	E601F	50	µg/L	6290.168 µg/L	82.2	70.0	130	----
EPH >C16-C21	n/a	E601F	50	µg/L	2467.832 µg/L	89.2	70.0	130	----
EPH >C21-C32	n/a	E601F	50	µg/L	3685.411 µg/L	87.4	70.0	130	----
EPH >C34-C50	n/a	E601F	100	µg/L	5075.368 µg/L	88.2	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 788544)</b>									
acenaphthene	83-32-9	E641A-L	0.01	µg/L	0.5263 µg/L	98.0	50.0	140	----
acenaphthylene	208-96-8	E641A-L	0.01	µg/L	0.5263 µg/L	96.1	50.0	140	----
acridine	260-94-6	E641A-L	0.01	µg/L	0.5263 µg/L	101	50.0	140	----
anthracene	120-12-7	E641A-L	0.01	µg/L	0.5263 µg/L	90.3	50.0	140	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 788544) - continued</b>									
benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	0.5263 µg/L	101	50.0	140	----
benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	0.5263 µg/L	88.9	50.0	140	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	0.5263 µg/L	86.9	50.0	140	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	0.5263 µg/L	92.7	50.0	140	----
chrysene	218-01-9	E641A-L	0.01	µg/L	0.5263 µg/L	99.2	50.0	140	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	0.5263 µg/L	97.4	50.0	140	----
fluoranthene	206-44-0	E641A-L	0.01	µg/L	0.5263 µg/L	105	50.0	140	----
fluorene	86-73-7	E641A-L	0.01	µg/L	0.5263 µg/L	103	50.0	140	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	0.5263 µg/L	111	50.0	140	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	0.5263 µg/L	98.5	50.0	140	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	0.5263 µg/L	100	50.0	140	----
naphthalene	91-20-3	E641A-L	0.01	µg/L	0.5263 µg/L	95.8	50.0	140	----
perylene	198-55-0	E641A-L	0.01	µg/L	0.5263 µg/L	107	50.0	140	----
phenanthrene	85-01-8	E641A-L	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
pyrene	129-00-0	E641A-L	0.01	µg/L	0.5263 µg/L	103	50.0	140	----
quinoline	91-22-5	E641A-L	0.01	µg/L	0.5263 µg/L	96.4	50.0	140	----
<b>Polychlorinated Biphenyls (QCLot: 790062)</b>									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	97.2	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----





### Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 787355)</b>										
HA2200072-001	MW10-01	fluoride	16984-48-8	E235.F	0.967 mg/L	1 mg/L	96.7	75.0	125	----
<b>Anions and Nutrients (QCLot: 787356)</b>										
HA2200072-001	MW10-01	nitrate (as N)	14797-55-8	E235.NO3	2.44 mg/L	2.5 mg/L	97.8	75.0	125	----
<b>Anions and Nutrients (QCLot: 787357)</b>										
HA2200072-001	MW10-01	nitrite (as N)	14797-65-0	E235.NO2	0.508 mg/L	0.5 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 787358)</b>										
HA2200072-001	MW10-01	chloride	16887-00-6	E235.Cl	99.3 mg/L	100 mg/L	99.3	75.0	125	----
<b>Anions and Nutrients (QCLot: 787359)</b>										
HA2200072-001	MW10-01	sulfate (as SO4)	14808-79-8	E235.SO4	96.3 mg/L	100 mg/L	96.3	75.0	125	----
<b>Anions and Nutrients (QCLot: 787587)</b>										
HA2200072-001	MW10-01	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0191 mg/L	0.0196 mg/L	97.5	70.0	130	----
<b>Anions and Nutrients (QCLot: 788284)</b>										
HA2200072-001	MW10-01	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>										
HA2200069-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.65 mg/L	5 mg/L	113	70.0	130	----
<b>Total Metals (QCLot: 788597)</b>										
WT2225891-010	Anonymous	aluminum, total	7429-90-5	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		antimony, total	7440-36-0	E420	0.0539 mg/L	0.05 mg/L	108	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0519 mg/L	0.05 mg/L	104	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.00465 mg/L	0.005 mg/L	93.0	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0470 mg/L	0.05 mg/L	94.0	70.0	130	----
		boron, total	7440-42-8	E420	0.046 mg/L	0.05 mg/L	92.3	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00468 mg/L	0.005 mg/L	93.6	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00272 mg/L	0.0025 mg/L	109	70.0	130	----
		chromium, total	7440-47-3	E420	0.0126 mg/L	0.0125 mg/L	100	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0123 mg/L	0.0125 mg/L	98.1	70.0	130	----
		copper, total	7440-50-8	E420	0.0144 mg/L	0.0125 mg/L	115	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>										
WT2225891-010	Anonymous	iron, total	7439-89-6	E420	ND mg/L	0.05 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0239 mg/L	0.025 mg/L	95.7	70.0	130	----
		lithium, total	7439-93-2	E420	0.0127 mg/L	0.0125 mg/L	102	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0134 mg/L	0.0125 mg/L	108	70.0	130	----
		nickel, total	7440-02-0	E420	0.0236 mg/L	0.025 mg/L	94.3	70.0	130	----
		phosphorus, total	7723-14-0	E420	0.496 mg/L	0.5 mg/L	99.1	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.00513 mg/L	0.005 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0464 mg/L	0.05 mg/L	92.8	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	0.5 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00481 mg/L	0.005 mg/L	96.3	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.00448 mg/L	0.005 mg/L	89.6	70.0	130	----
		thallium, total	7440-28-0	E420	0.0489 mg/L	0.05 mg/L	97.8	70.0	130	----
		thorium, total	7440-29-1	E420	0.00500 mg/L	0.005 mg/L	100	70.0	130	----
		tin, total	7440-31-5	E420	0.0245 mg/L	0.025 mg/L	98.1	70.0	130	----
		titanium, total	7440-32-6	E420	0.0124 mg/L	0.0125 mg/L	99.0	70.0	130	----
		tungsten, total	7440-33-7	E420	0.00515 mg/L	0.005 mg/L	103	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0260 mg/L	0.025 mg/L	104	70.0	130	----
		zinc, total	7440-66-6	E420	0.0210 mg/L	0.025 mg/L	83.9	70.0	130	----
		zirconium, total	7440-67-7	E420	0.00544 mg/L	0.005 mg/L	109	70.0	130	----
<b>Dissolved Metals (QCLot: 787811)</b>										
WT2225934-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0508 mg/L	0.05 mg/L	102	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0620 mg/L	0.05 mg/L	124	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.00492 mg/L	0.005 mg/L	98.4	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0452 mg/L	0.05 mg/L	90.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.042 mg/L	0.05 mg/L	83.9	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00531 mg/L	0.005 mg/L	106	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>										
WT2225934-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00280 mg/L	0.0025 mg/L	112	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0131 mg/L	0.0125 mg/L	105	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0130 mg/L	0.0125 mg/L	104	70.0	130	----
		iron, dissolved	7439-89-6	E421	0.051 mg/L	0.05 mg/L	103	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0113 mg/L	0.0125 mg/L	90.4	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0128 mg/L	0.0125 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0254 mg/L	0.025 mg/L	101	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	0.629 mg/L	0.5 mg/L	126	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.00547 mg/L	0.005 mg/L	109	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	0.5 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00452 mg/L	0.005 mg/L	90.4	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.00590 mg/L	0.005 mg/L	118	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.00501 mg/L	0.005 mg/L	100	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0259 mg/L	0.025 mg/L	104	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.00503 mg/L	0.005 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0270 mg/L	0.025 mg/L	108	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.0266 mg/L	0.025 mg/L	106	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.00494 mg/L	0.005 mg/L	98.8	70.0	130	----
<b>Speciated Metals (QCLot: 789161)</b>										
HA2200072-004	SURF-UP	chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0381 mg/L	0.04 mg/L	95.4	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>										
HA2200073-001	Anonymous	benzene	71-43-2	E611A	89.0 µg/L	100 µg/L	89.0	60.0	140	----
		ethylbenzene	100-41-4	E611A	87.2 µg/L	100 µg/L	87.2	60.0	140	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 788079) - continued</b>										
HA2200073-001	Anonymous	toluene	108-88-3	E611A	88.4 µg/L	100 µg/L	88.4	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	174 µg/L	200 µg/L	86.8	60.0	140	----
		xylene, o-	95-47-6	E611A	88.0 µg/L	100 µg/L	88.0	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>										
HA2200073-001	Anonymous	Acetone	67-64-1	E611D	123 µg/L	100 µg/L	123	60.0	140	----
		bromodichloromethane	75-27-4	E611D	97.7 µg/L	100 µg/L	97.7	60.0	140	----
		bromoform	75-25-2	E611D	95.9 µg/L	100 µg/L	95.9	60.0	140	----
		bromomethane	74-83-9	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		carbon disulfide	75-15-0	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		carbon tetrachloride	56-23-5	E611D	95.2 µg/L	100 µg/L	95.2	60.0	140	----
		chlorobenzene	108-90-7	E611D	87.7 µg/L	100 µg/L	87.7	60.0	140	----
		chloroethane	75-00-3	E611D	94.1 µg/L	100 µg/L	94.1	60.0	140	----
		chloroform	67-66-3	E611D	93.6 µg/L	100 µg/L	93.6	60.0	140	----
		chloromethane	74-87-3	E611D	92.3 µg/L	100 µg/L	92.3	60.0	140	----
		dibromochloromethane	124-48-1	E611D	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		dibromoethane, 1,2-	106-93-4	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	88.8 µg/L	100 µg/L	88.8	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611D	84.1 µg/L	100 µg/L	84.1	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	85.0 µg/L	100 µg/L	85.0	60.0	140	----
		dichlorodifluoromethane	75-71-8	E611D	80.9 µg/L	100 µg/L	80.9	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611D	94.3 µg/L	100 µg/L	94.3	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611D	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	95.7 µg/L	100 µg/L	95.7	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	86.2 µg/L	100 µg/L	86.2	60.0	140	----
		dichloromethane	75-09-2	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611D	94.0 µg/L	100 µg/L	94.0	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	93.4 µg/L	100 µg/L	93.4	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	93.8 µg/L	100 µg/L	93.8	60.0	140	----
		hexane, n-	110-54-3	E611D	83.5 µg/L	100 µg/L	83.5	60.0	140	----
		hexanone, 2-	591-78-6	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	95.8 µg/L	100 µg/L	95.8	60.0	140	----
		styrene	100-42-5	E611D	90.2 µg/L	100 µg/L	90.2	60.0	140	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>										
HA2200073-001	Anonymous	tetrachloroethane, 1,1,1,2-	630-20-6	E611D	91.4 µg/L	100 µg/L	91.4	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		tetrachloroethylene	127-18-4	E611D	88.3 µg/L	100 µg/L	88.3	60.0	140	----
		toluene	108-88-3	E611D	88.4 µg/L	100 µg/L	88.4	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611D	93.6 µg/L	100 µg/L	93.6	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		trichloroethylene	79-01-6	E611D	93.0 µg/L	100 µg/L	93.0	60.0	140	----
		trichlorofluoromethane	75-69-4	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		vinyl chloride	75-01-4	E611D	89.8 µg/L	100 µg/L	89.8	60.0	140	----
<b>Hydrocarbons (QCLot: 788078)</b>										
HA2200073-001	Anonymous	VPH C6-C10	n/a	E581.VPH	2040 µg/L	2000 µg/L	102	60.0	140	----




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : HA2200072</p> <p><b>Client</b> : Englobe Corp.</p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : ----</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 6</p> <p><b>No. of samples analysed</b> : 6</p>	<p><b>Page</b> : 1 of 25</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 22-Dec-2022 10:00</p> <p><b>Issue Date</b> : 05-Jan-2023 16:02</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

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### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

***Outliers : Analysis Holding Time Compliance (Breaches)***

- Analysis Holding Time Outliers exist - please see following pages for full details.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW10-01	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW10-01(DUP)	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW10-01A	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) SURF-DOWN	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) SURF-DOWN(DUP)	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) SURF-UP	E298	21-Dec-2022	23-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE MW10-01	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓





Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE MW10-01(DUP)	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE MW10-01A	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE SURF-DOWN	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE SURF-DOWN(DUP)	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE SURF-UP	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW10-01	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	* EHT	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW10-01(DUP)	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	* EHT	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW10-01A	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	* EHT	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)</b>											
HDPE SURF-DOWN	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	*	EHT
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)</b>											
HDPE SURF-DOWN(DUP)	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	*	EHT
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)</b>											
HDPE SURF-UP	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	*	EHT
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW10-01	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW10-01(DUP)	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW10-01A	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE SURF-DOWN	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE SURF-DOWN(DUP)	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE SURF-UP	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE MW10-01	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE MW10-01(DUP)	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE MW10-01A	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE SURF-DOWN	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE SURF-DOWN(DUP)	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE SURF-UP	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrite in Water by IC</b>										
HDPE MW10-01	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔
<b>Anions and Nutrients : Nitrite in Water by IC</b>										
HDPE MW10-01(DUP)	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE MW10-01A	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE SURF-DOWN	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE SURF-DOWN(DUP)	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE SURF-UP	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW10-01	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW10-01(DUP)	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW10-01A	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE SURF-DOWN	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE SURF-DOWN(DUP)	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
<b>HDPE</b> SURF-UP	E235.S04	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> MW10-01	E421	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> MW10-01(DUP)	E421	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> MW10-01A	E421	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	180 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01(DUP)	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01A	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> SURF-DOWN	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> SURF-DOWN(DUP)	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) SURF-UP	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW10-01	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW10-01(DUP)	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW10-01A	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-DOWN	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-DOWN(DUP)	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-UP	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW10-01	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW10-01(DUP)	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW10-01A	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) SURF-DOWN	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) SURF-DOWN(DUP)	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) SURF-UP	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW10-01	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW10-01(DUP)	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW10-01A	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) SURF-DOWN	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) SURF-DOWN(DUP)	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass dissolved (sulfuric acid)</b> SURF-UP	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> MW10-01	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> MW10-01(DUP)	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> MW10-01A	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> SURF-DOWN	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> SURF-DOWN(DUP)	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> SURF-UP	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
<b>HDPE</b> MW10-01	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
<b>HDPE</b> MW10-01(DUP)	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔





Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
HDPE MW10-01A	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
HDPE SURF-DOWN	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
HDPE SURF-DOWN(DUP)	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>										
HDPE SURF-UP	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✔
<b>Physical Tests : Conductivity in Water</b>										
HDPE MW10-01	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✔
<b>Physical Tests : Conductivity in Water</b>										
HDPE MW10-01(DUP)	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✔
<b>Physical Tests : Conductivity in Water</b>										
HDPE MW10-01A	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✔
<b>Physical Tests : Conductivity in Water</b>										
HDPE SURF-DOWN	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✔
<b>Physical Tests : Conductivity in Water</b>										
HDPE SURF-DOWN(DUP)	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✔



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Conductivity in Water</b>											
HDPE SURF-UP	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✓	
<b>Physical Tests : pH by Meter</b>											
HDPE MW10-01	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE MW10-01(DUP)	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE MW10-01A	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE SURF-DOWN	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE SURF-DOWN(DUP)	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE SURF-UP	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW10-01	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✓	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW10-01(DUP)	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE MW10-01A	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE SURF-DOWN	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE SURF-DOWN(DUP)	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE SURF-UP	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✔
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE MW10-01	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE MW10-01(DUP)	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE MW10-01A	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE SURF-DOWN	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE SURF-DOWN(DUP)	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Physical Tests : Turbidity by Nephelometry</b>										
<b>HDPE</b> SURF-UP	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> MW10-01	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> MW10-01(DUP)	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> MW10-01A	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> SURF-DOWN	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> SURF-DOWN(DUP)	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>										
<b>Amber glass/Teflon lined cap</b> SURF-UP	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>										
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> MW10-01	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>										
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> MW10-01(DUP)	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW10-01A	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-DOWN	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-DOWN(DUP)	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SURF-UP	E641A-L	21-Dec-2022	23-Dec-2022	14 days	3 days	✔	30-Dec-2022	40 days	7 days	✔	
<b>Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC</b>											
UV-inhibited HDPE - total (sodium hydroxide) SURF-DOWN	E532	21-Dec-2022	----	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC</b>											
UV-inhibited HDPE - total (sodium hydroxide) SURF-DOWN(DUP)	E532	21-Dec-2022	----	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC</b>											
UV-inhibited HDPE - total (sodium hydroxide) SURF-UP	E532	21-Dec-2022	----	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Total Metals : Total metals in Water by CRC ICPMS</b>											
HDPE total (nitric acid) SURF-DOWN	E420	21-Dec-2022	23-Dec-2022	----	----		28-Dec-2022	180 days	8 days	✔	
<b>Total Metals : Total metals in Water by CRC ICPMS</b>											
HDPE total (nitric acid) SURF-DOWN(DUP)	E420	21-Dec-2022	23-Dec-2022	----	----		28-Dec-2022	180 days	8 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Total Metals : Total metals in Water by CRC ICPMS</b>											
<b>HDPE total (nitric acid)</b> SURF-UP	E420	21-Dec-2022	23-Dec-2022	----	----		28-Dec-2022	180 days	8 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01(DUP)	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW10-01A	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> SURF-DOWN	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> SURF-DOWN(DUP)	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> SURF-UP	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended  
 EHT: Exceeded ALS recommended hold time prior to analysis.  
 Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	788284	1	19	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✓
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✓
Conductivity in Water	E100	787361	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✓
pH by Meter	E108	787360	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✓
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✓
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	788284	1	19	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✓
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✓
Conductivity in Water	E100	787361	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✓
EPH by GC-FID (RBCA)	E601F	789756	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	788544	1	8	12.5	5.0	✓
PCB Aroclors by GC-MS	E687	790062	1	15	6.6	4.7	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
pH by Meter	E108	787360	1	16	6.2	5.0	✔
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✔
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✔
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✔
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✔
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✔
Ammonia by Fluorescence	E298	788284	1	19	5.2	5.0	✔
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✔
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✔
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✔
Conductivity in Water	E100	787361	1	10	10.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✔
EPH by GC-FID (RBCA)	E601F	789756	1	12	8.3	5.0	✔
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✔
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✔
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✔
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	788544	1	8	12.5	5.0	✔
PCB Aroclors by GC-MS	E687	790062	1	15	6.6	4.7	✔
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✔
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✔
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✔
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✔
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	788284	1	19	5.2	5.0	✔
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✔
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✔





Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✔
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✔
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Waterloo - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Waterloo - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 Waterloo - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Waterloo - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Waterloo - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 Waterloo - Environmental	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters.  Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Waterloo - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Waterloo - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total metals in Water by CRC ICPMS	E420 Waterloo - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Waterloo - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Hexavalent Chromium (Cr VI) by IC	E532 Waterloo - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection.  Results are based on an un-filtered, field-preserved sample.
VPH by Headspace GC-FID (RBCA)	E581.VPH Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH by GC-FID (RBCA)	E601F Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BTEX by Headspace GC-MS	E611A Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L Waterloo - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Hardness (Calculated) from Total Ca/Mg	EC100A Waterloo - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Dissolved Metals	EC101 Waterloo - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Ion Balance using Total Metals	EC101A Waterloo - Environmental	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Langelier Index using Laboratory pH (Ca-D)	EC105 Waterloo - Environmental	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO <sub>3</sub> . Negative values indicate undersaturation of CaCO <sub>3</sub> . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. If available, Field pH measurements are recommended for best accuracy (test code EC104).
Langelier Index using Laboratory pH (Ca-T)	EC105A Waterloo - Environmental	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO <sub>3</sub> . Negative values indicate undersaturation of CaCO <sub>3</sub> . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N  Waterloo - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2  Waterloo - Environmental	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).
Dissolved Silicon as Silica (Calculation)	EC421.SiO2  Waterloo - Environmental	Water	N/A	Dissolved Silicon (as SiO2) is a calculated parameter. Dissolved Silicon (as SiO2 mg/L) = 2.139 x Dissolved Silicon (mg/L).
Total Trivalent Chromium (Cr III) by Calculation	EC535  Waterloo - Environmental	Water	APHA 3030B/6020A/EPA 7196A (mod)	Chromium (III)-Total is calculated as the difference between the total chromium and the total hexavalent chromium (Cr(VI)) results. The Limit of Reporting for Chromium (III) varies as a function of the test results.
VPH C6-C10 (less BTEX) [RBCA]	EC580C  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Modified TPH (RBCA) Tier I	EC581D  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Modified TPH (PIRI), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) + (>C16 - C21) + (>C21 - C32).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298  Waterloo - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358  Waterloo - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421  Waterloo - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581  Waterloo - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.



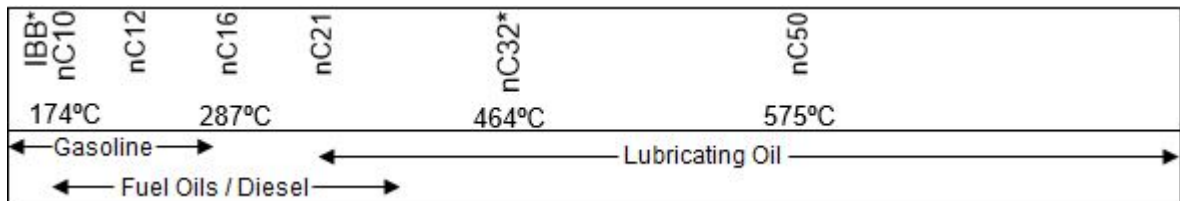
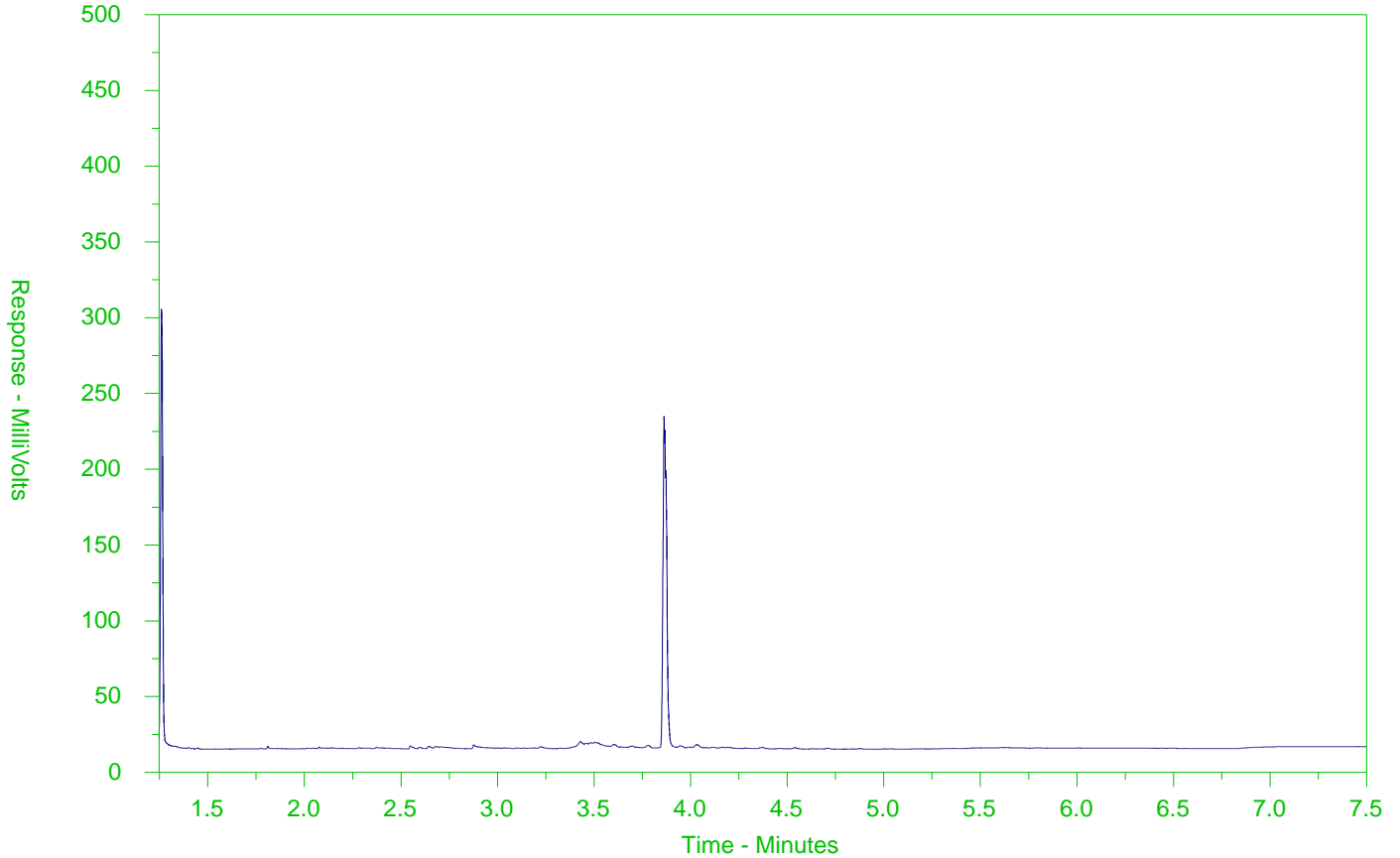
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
PHCs and PAHs Hexane Extraction	EP601  Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
PHCs Hexane Extraction (RBCA)	EP601F  Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) are extracted using a hexane liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660  Waterloo - Environmental	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2200072-001-E601F  
Client Sample ID: MW10-01



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

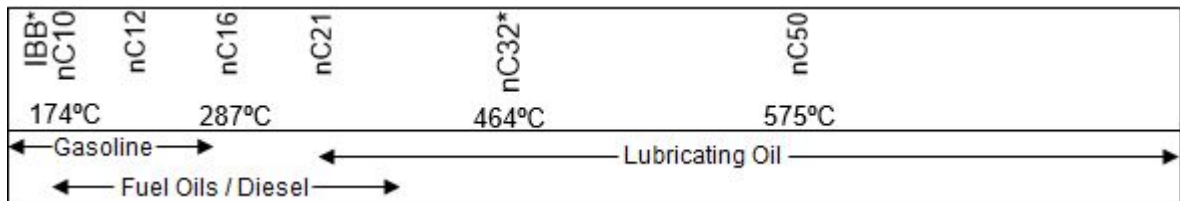
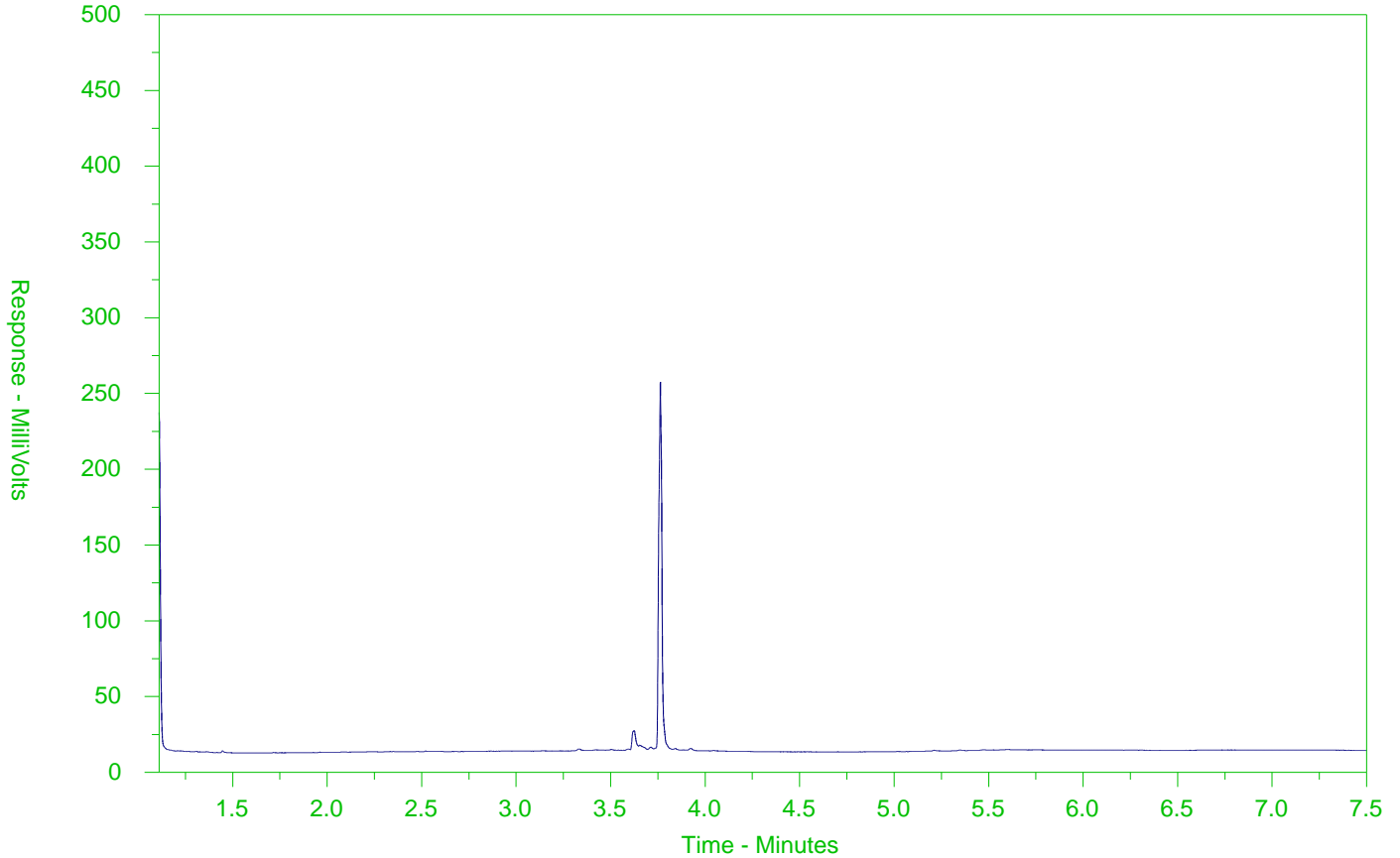


# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2200072-002-E601F  
Client Sample ID: MW10-01A



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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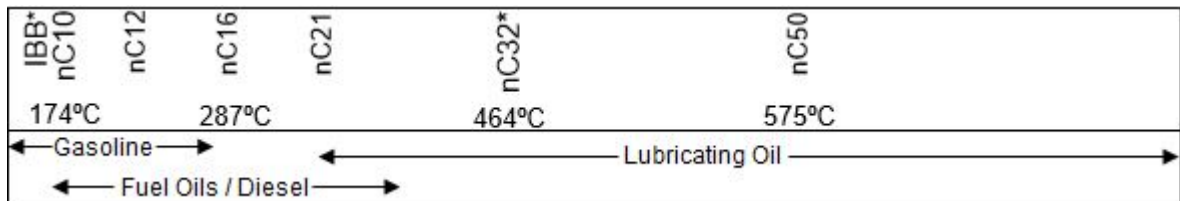
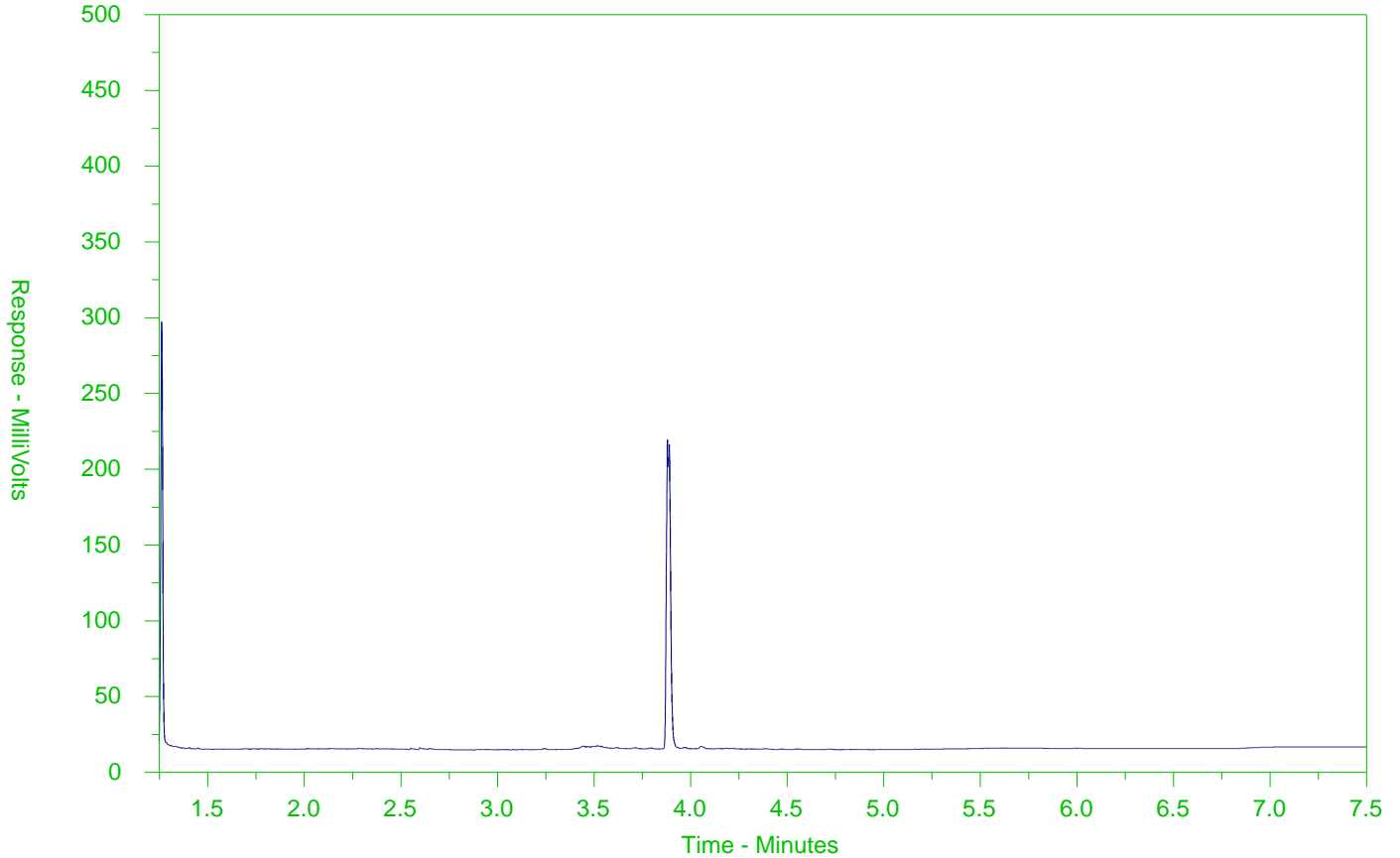
extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



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right partner.

ALS Sample ID: HA2200072-003-E601F  
Client Sample ID: MW10-01(DUP)



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

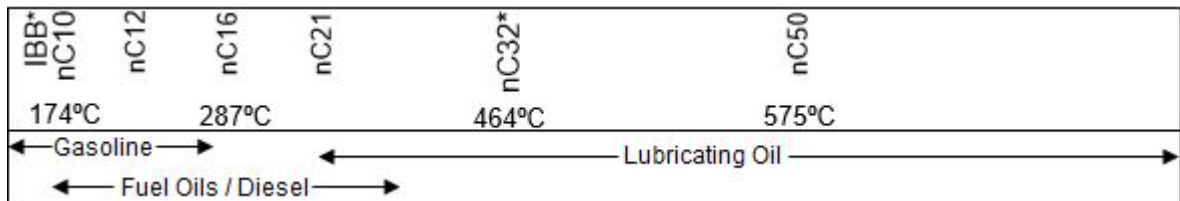
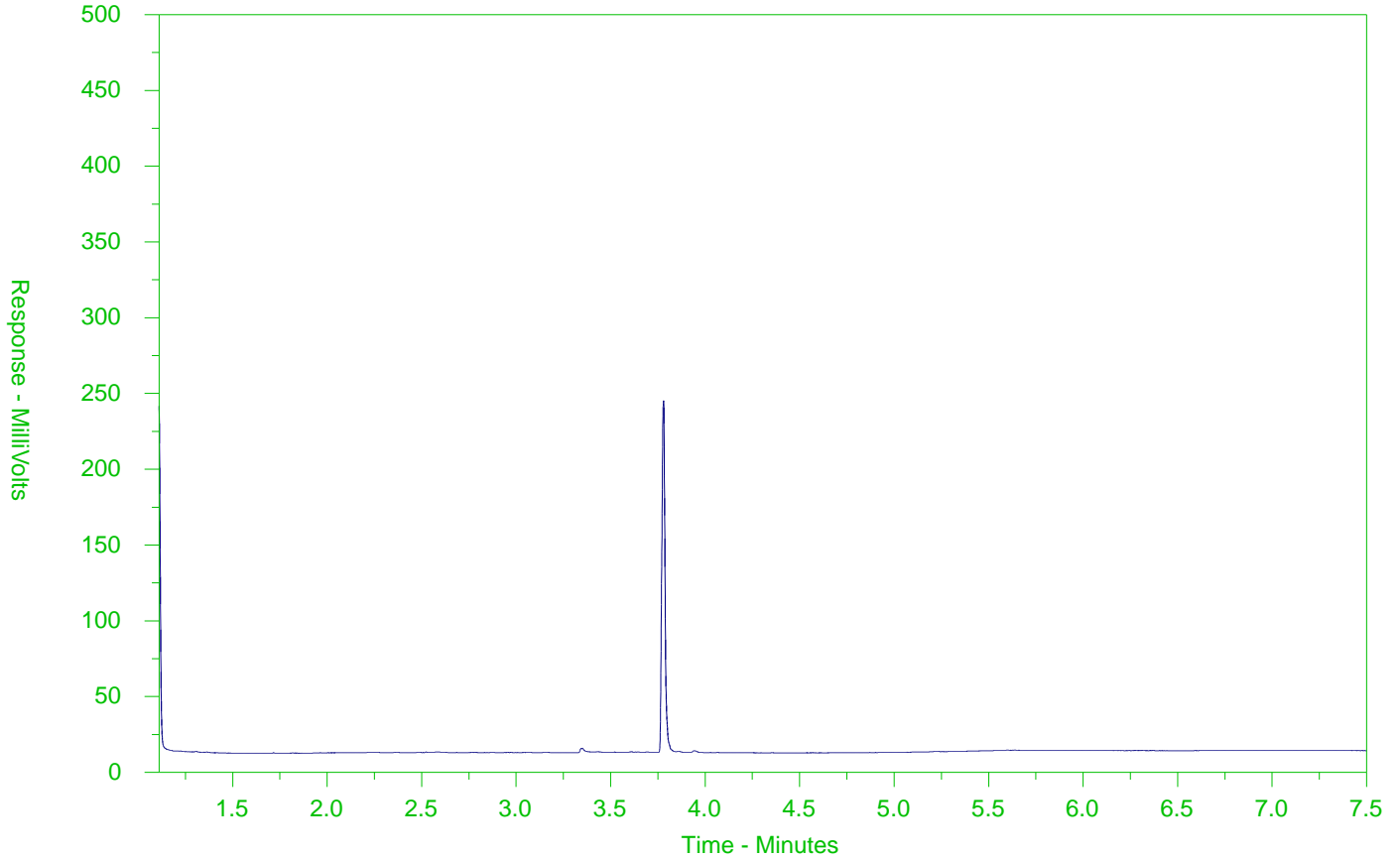
# ALS Environmental

## RBCA HYDROCARBON DISTRIBUTION REPORT



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right partner.

ALS Sample ID: HA2200072-004-E601F  
Client Sample ID: SURF-UP



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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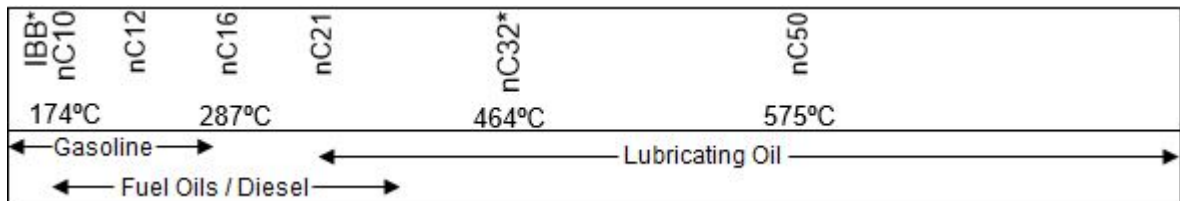
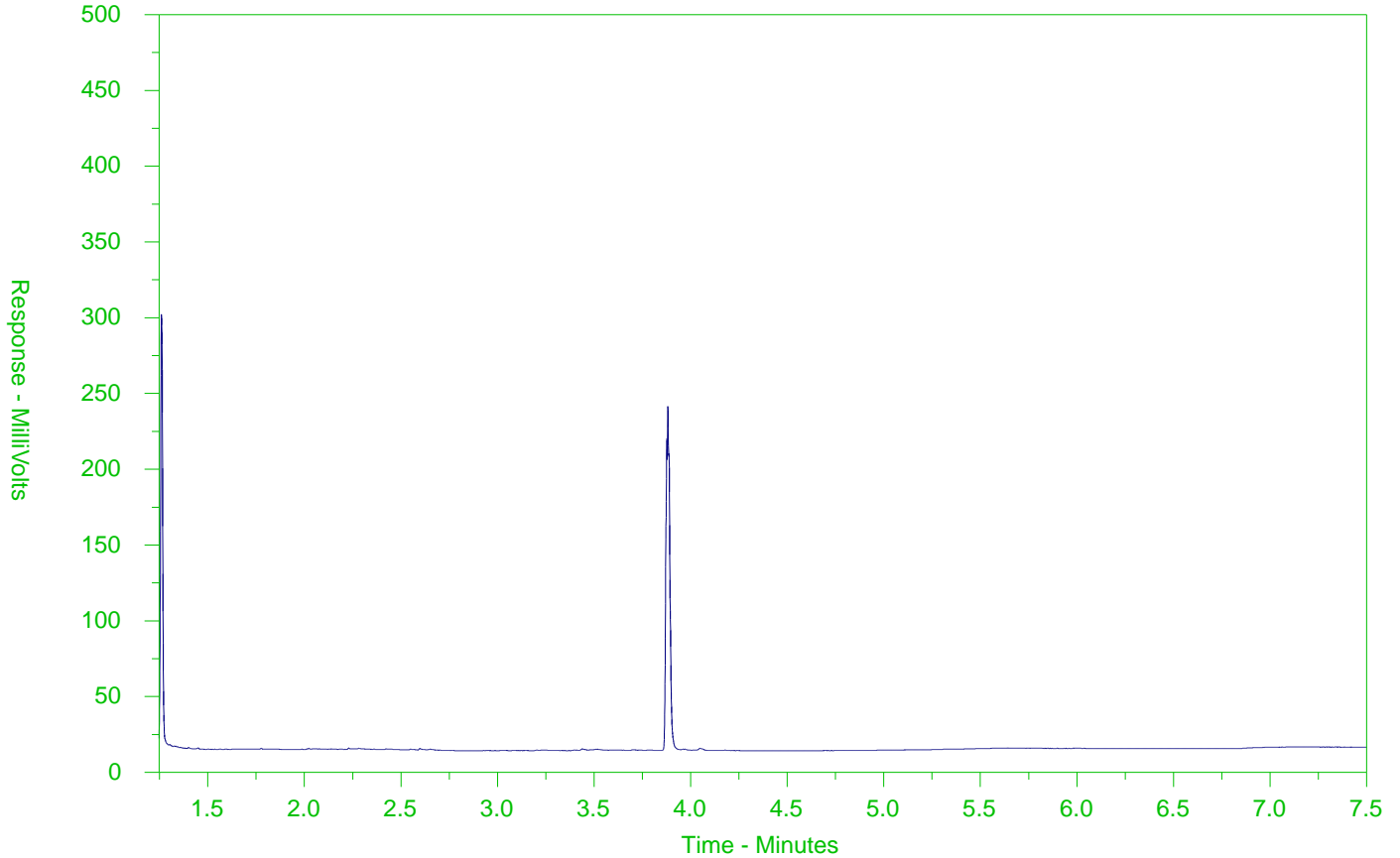
extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



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ALS Sample ID: HA2200072-005-E601F  
Client Sample ID: SURF-DOWN



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

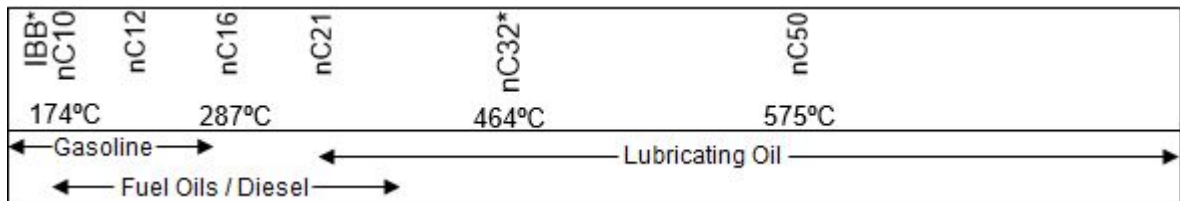
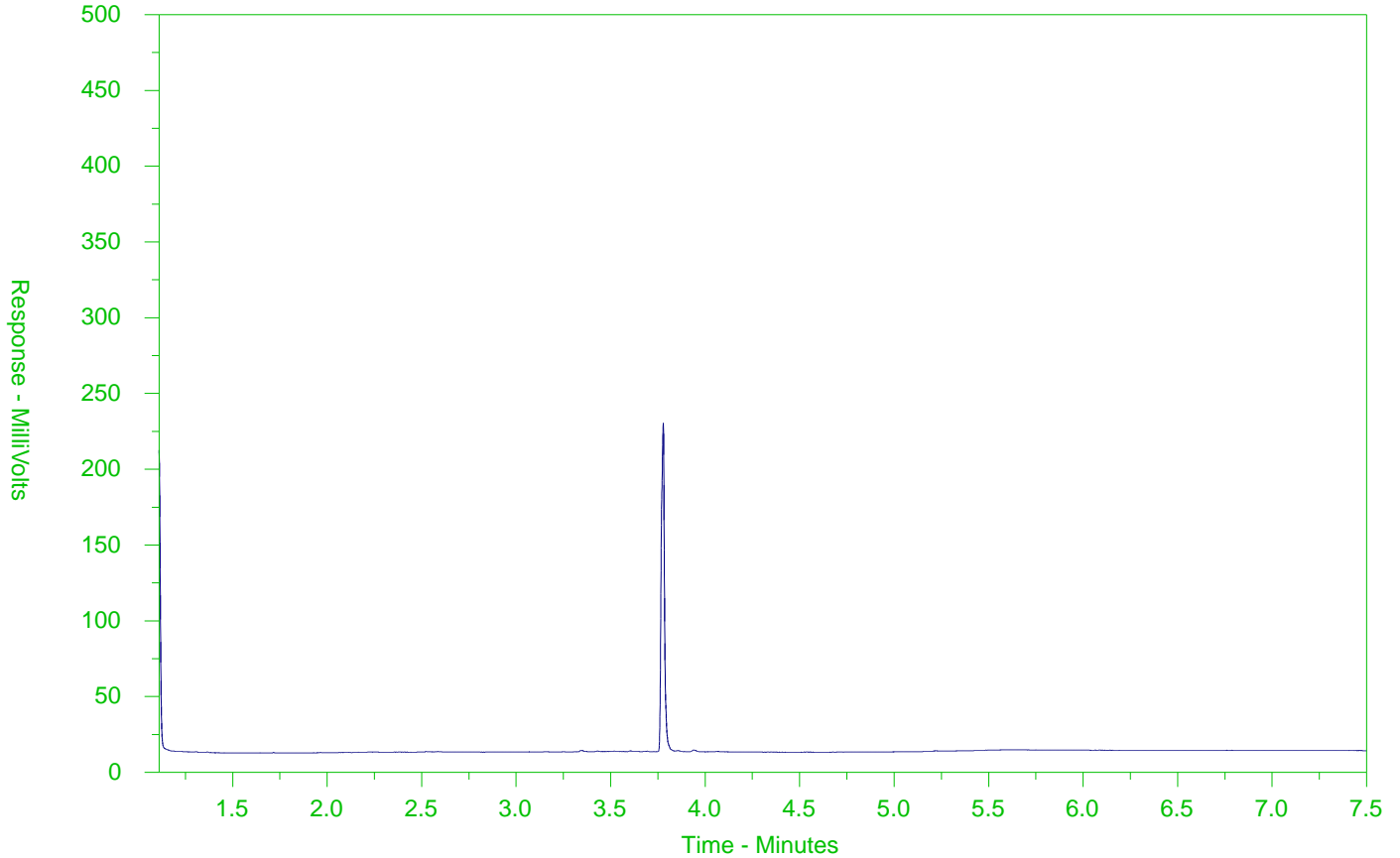


# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



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right partner.

ALS Sample ID: HA2200072-006-E601F  
Client Sample ID: SURF-DOWN(DUP)



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.



www.alsglobal.com

# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Environmental Division  
Halfax  
Work Order Reference  
HA2200072

Page 1

Report To: Englobe Corp.

Company: Englobe Corp.

Contact: Mike Smith

Phone: 709-743-6096

Street: 39 Sagona Ave

City/Province: Mount Pearl, NL

Postal Code: A1N 4P9

Invoice To: Same as Report To

Copy of Invoice with Report:  YES  NO

Company:  YES  NO

Contact:  YES  NO

ALS Account # / Quote #: HA2022ENGL1000001

Job #: 220292.000

PO/A/E: Come By Chance Haz Waste Landfill

LSD: Come By Chance Haz Waste Landfill

ALS Lab Work Order # (lab use only): HA2200072

Report Format / Distribution

Select Report Format:  PDF  EXCEL  EOD (DIGITAL)

Quality Control (QC) Report with Report:  YES  NO

Compare Results to Criteria on Report - provide details below if box checked

Select Distribution:  EMAIL  MAIL  FAX

Email 1 or Fax: Michael.Smith2@englobecorp.com

Email 2: Mike.Smith@englobecorp.com

Email 3: *Michael.Smith2@englobecorp.com*

Select Invoice Distribution:  EMAIL  MAIL  FAX

Email 1 or Fax: cp.factures@englobecorp.com

Email 2: Michael.Smith2@englobecorp.com

Oil and Gas Required Fields (client use)

AP/E/Coast Center: PO#

Major/Minor Code: Routing Code:

Requisitioner: Location:

ALS Contact: Emily Smith

Sampler: *JD*

Sample Identification and/or Coordinates (This description will appear on the report)

MW10-01

MW10-01A

MW10-01(Duo)

Surf - up

Surf - down

Surf - down (Duo)

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Water

Select Service Level Below - Contact your AM to confirm	Regular [R]		EMERGENCY	
	4 day [P4-20%]	3 day [P3-25%]	1 Business day	Same Day, Next Laboratory open
Standard TAT if received by 3 pm - bu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date and Time Required for all EAP TATS:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below	
	F	FP
Groundwater		
General Chemistry with Dissolved Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BTEX/TPH (RBCA Tier I) in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VOCs in Water - Full List	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PAHs in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PCBs in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Surface Water		
General Chemistry with Metals (Total)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Total Cr6+ and Cr3+ in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BTEX/TPH (RBCA Tier I) in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VOCs in Water - Full List	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PAHs in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PCBs in Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

Drinking Water (DW) Samples (client use)

Are samples taken from a Regulated DW System?  YES  NO

Are samples for human consumption use?  YES  NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SHIPMENT RELEASE (client use)

Released by: *Mike Smith* Date: *Dec 21/22*

Time: *9:00*

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: *JD* Date: *12/22/22*

Time: *9:00*

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen  SIF Observations Yes  No

Ice Packs  Ice Cubes  Custody seal intact Yes  No

Cooling Initiated

INITIAL COOLER TEMPERATURES °C: *6-4*

FINAL COOLER TEMPERATURES °C: *7-9*

FINAL SHIPMENT RECEPTION (lab use only)

Received by: *JD* Date: *12/22/22*

Time: *9:00*

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

For the use of this form the user acknowledges and agrees to the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

OR-190, VW-219, GC-265 N-496, MM-533

NOV 27 10 18 AM '22



## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<p><b>Work Order</b> : HA2200073</p> <p><b>Amendment</b> : 1</p> <p><b>Client</b> : Englobe Corp.</p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : ----</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 2</p> <p><b>No. of samples analysed</b> : 2</p>	<p><b>Page</b> : 1 of 18</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 22-Dec-2022 10:00</p> <p><b>Date Analysis Commenced</b> : 21-Dec-2022</p> <p><b>Issue Date</b> : 11-Jan-2023 17:32</p>
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Emily Smith	Project Manager	External Subcontracting, St. John's, Newfoundland and Labrador
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
none	none
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLHC	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
DLMDL	<i>Reported detection limit is at or near the Method Detection Limit (MDL). Measurement uncertainty is high at this level.</i>



## Analytical Results

Sub-Matrix: Water (Matrix: Water)	Method	LOR	Unit	Client sample ID	PLCS	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
				Sampling date/time	21-Dec-2022 00:00						
Analyte				HA2200073-001							
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	214	--	--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	176	--	--	--	--	--	--	--
colour, apparent	E330	2.0	CU	60.7	--	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	399	--	--	--	--	--	--	--
hardness (as CaCO3), from total Ca/Mg	EC100A	0.50	mg/L	177	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105A	0.010	-	0.417	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105A	0.010	-	0.168	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105A	0.010	pH units	7.38	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105A	0.010	pH units	7.63	--	--	--	--	--	--	--
pH	E108	0.10	pH units	7.80	<b>6.5 - 9 pH units</b>	--	<b>5.5 - 9 pH units</b>	--	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	251	DLDS	--	<b>1000 mg/L</b>	--	--	--	--
turbidity	E121	0.10	NTU	0.55	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	0.139	--	--	<b>2 mg/L</b>	--	--	--	--
chloride	E235.Cl	0.50	mg/L	14.6	120 mg/L	--	--	--	--	--	--
fluoride	E235.F	0.020	mg/L	0.093	0.12 mg/L	--	--	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	0.381	<b>3 mg/L</b>	--	<b>10 mg/L</b>	--	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	0.381	--	--	<b>10 mg/L</b>	--	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	0.06 mg/L	--	--	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	0.0016	--	--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	8.69	--	--	--	--	--	--	--
<b>Cyanides</b>											
cyanide, strong acid dissociable (total)	E333	0.0050	mg/L	<0.0050	--	--	<b>0.025 mg/L</b>	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	7.31	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Total Sulfides</b>										
sulfide, total (as H2S)	E396	0.019	mg/L	0.022	--	--	--	--	--	--
sulfide, total (as S)	E396	0.018	mg/L	0.021	--	--	0.5 mg/L	--	--	--
<b>Bioassays</b>										
trout bioassay LC50	TRT-LC50-96		-	See attached	--	--	--	--	--	--
<b>Ion Balance</b>										
anion sum	EC101A	0.10	meq/L	4.14	--	--	--	--	--	--
cation sum (total)	EC101A	0.10	meq/L	4.28	--	--	--	--	--	--
ion balance (cations/anions)	EC101A	0.01	%	103	--	--	--	--	--	--
<b>Total Metals</b>										
aluminum, total	E420	0.0030	mg/L	0.0189	0.005 mg/L	--	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
arsenic, total	E420	0.00010	mg/L	0.00020	0.005 mg/L	--	0.5 mg/L	--	--	--
barium, total	E420	0.00010	mg/L	0.0431	--	--	5 mg/L	--	--	--
beryllium, total	E420	0.000020	mg/L	<0.000020	--	--	--	--	--	--
bismuth, total	E420	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, total	E420	0.010	mg/L	0.530	--	--	5 mg/L	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.0000050	4E-05 mg/L	--	0.05 mg/L	--	--	--
calcium, total	E420	0.100	mg/L	60.3	--	--	--	--	--	--
cesium, total	E420	0.000010	mg/L	0.000050	--	--	--	--	--	--
chromium, total	E420	0.00050	mg/L	0.00059	0.001 mg/L	--	--	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
copper, total	E420	0.00050	mg/L	0.00169	0.002 mg/L	--	0.3 mg/L	--	--	--
iron, total	E420	0.010	mg/L	0.360	0.3 mg/L	--	10 mg/L	--	--	--
lead, total	E420	0.000050	mg/L	<0.000050	0.001 mg/L	--	0.2 mg/L	--	--	--
lithium, total	E420	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, total	E420	0.0050	mg/L	6.53	--	--	--	--	--	--
manganese, total	E420	0.00010	mg/L	0.188	0.2 mg/L	2 mg/L	--	--	--	--
mercury, total	E508	0.0000050	mg/L	<0.0000050	2.6E-05 mg/L	--	0.005 mg/L	--	--	--
molybdenum, total	E420	0.000050	mg/L	0.000562	0.073 mg/L	--	--	--	--	--
nickel, total	E420	0.00050	mg/L	0.00055	0.025 mg/L	--	0.5 mg/L	--	--	--
phosphorus, total	E420	0.050	mg/L	<0.050	--	--	0.0005 mg/L	--	--	--
potassium, total	E420	0.050	mg/L	5.15	--	--	--	--	--	--
rubidium, total	E420	0.00020	mg/L	0.00790	--	--	--	--	--	--
selenium, total	E420	0.000050	mg/L	0.000053	0.001 mg/L	--	0.01 mg/L	--	--	--
silicon (as SiO2), total	EC420.SiO2	0.25	mg/L	9.56	--	--	--	--	--	--
silicon, total	E420	0.10	mg/L	4.47	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Total Metals - Continued</b>										
silver, total	E420	0.000010	mg/L	<0.000010	0.00025 mg/L	--	0.05 mg/L	--	--	--
sodium, total	E420	0.050	mg/L	13.1	--	--	--	--	--	--
strontium, total	E420	0.00020	mg/L	0.160	--	--	--	--	--	--
sulfur, total	E420	0.50	mg/L	3.10	--	--	--	--	--	--
tellurium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, total	E420	0.000010	mg/L	<0.000010	0.0008 mg/L	--	--	--	--	--
thorium, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, total	E420	0.00010	mg/L	0.00011	--	--	--	--	--	--
titanium, total	E420	0.00030	mg/L	0.00057	--	--	--	--	--	--
tungsten, total	E420	0.00010	mg/L	<0.00010	--	--	--	--	--	--
uranium, total	E420	0.000010	mg/L	0.000196	--	--	--	--	--	--
vanadium, total	E420	0.00050	mg/L	<0.00050	--	--	--	--	--	--
zinc, total	E420	0.0030	mg/L	<0.0030	0.007 mg/L	0.037 mg/L	0.5 mg/L	--	--	--
zirconium, total	E420	0.00020	mg/L	<0.00020	--	--	--	--	--	--
<b>Dissolved Metals</b>										
aluminum, dissolved	E421	0.0010	mg/L	0.0098	0.005 mg/L	--	--	--	--	--
antimony, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
arsenic, dissolved	E421	0.00010	mg/L	0.00020	0.005 mg/L	--	--	--	--	--
barium, dissolved	E421	0.00010	mg/L	0.0400	--	--	--	--	--	--
beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	--	--	--	--	--
bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
boron, dissolved	E421	0.010	mg/L	0.430	--	--	--	--	--	--
cadmium, dissolved	E421	0.0000050	mg/L	<0.0000050	4E-05 mg/L	--	--	--	--	--
calcium, dissolved	E421	0.050	mg/L	55.1	--	--	--	--	--	--
cesium, dissolved	E421	0.000010	mg/L	0.000050	--	--	--	--	--	--
chromium, dissolved	E421	0.00050	mg/L	<0.00050	0.001 mg/L	--	--	--	--	--
cobalt, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
copper, dissolved	E421	0.00020	mg/L	0.00150	0.002 mg/L	--	--	--	--	--
iron, dissolved	E421	0.010	mg/L	0.393	0.3 mg/L	--	--	--	--	--
lead, dissolved	E421	0.000050	mg/L	<0.000050	0.001 mg/L	--	--	--	--	--
lithium, dissolved	E421	0.0010	mg/L	<0.0010	--	--	--	--	--	--
magnesium, dissolved	E421	0.0050	mg/L	6.75	--	--	--	--	--	--
manganese, dissolved	E421	0.00010	mg/L	0.176	0.2 mg/L	2 mg/L	--	--	--	--
mercury, dissolved	E509	0.0000050	mg/L	0.0000052	2.6E-05 mg/L	--	--	--	--	--
molybdenum, dissolved	E421	0.000050	mg/L	0.000496	0.073 mg/L	--	--	--	--	--
nickel, dissolved	E421	0.00050	mg/L	<0.00050	0.025 mg/L	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Dissolved Metals - Continued</b>										
phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
potassium, dissolved	E421	0.050	mg/L	5.00	--	--	--	--	--	--
rubidium, dissolved	E421	0.00020	mg/L	0.00738	--	--	--	--	--	--
selenium, dissolved	E421	0.000050	mg/L	0.000082	0.001 mg/L	--	--	--	--	--
silicon, dissolved	E421	0.050	mg/L	4.41	--	--	--	--	--	--
silver, dissolved	E421	0.000010	mg/L	<0.000010	0.00025 mg/L	--	--	--	--	--
sodium, dissolved	E421	0.050	mg/L	12.7	--	--	--	--	--	--
strontium, dissolved	E421	0.00020	mg/L	0.148	--	--	--	--	--	--
sulfur, dissolved	E421	0.50	mg/L	3.02	--	--	--	--	--	--
tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
thallium, dissolved	E421	0.000010	mg/L	<0.000010	0.0008 mg/L	--	--	--	--	--
thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
tin, dissolved	E421	0.00010	mg/L	0.00022	--	--	--	--	--	--
titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--
tungsten, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
uranium, dissolved	E421	0.000010	mg/L	0.000180	--	--	--	--	--	--
vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	--	--	--	--	--
zinc, dissolved	E421	0.0010	mg/L	<0.0010	0.007 mg/L	0.037 mg/L	--	--	--	--
zirconium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--
dissolved mercury filtration location	EP509		-	Field	--	--	--	--	--	--
dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Speciated Metals</b>										
chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	0.05 mg/L	--	--	--
chromium, trivalent [Cr III], total	EC535	0.00050	mg/L	0.00059	--	--	1 mg/L	--	--	--
<b>Aggregate Organics</b>										
phenols, total (4AAP)	E562	0.0010	mg/L	0.0029	0.004 mg/L	--	0.1 mg/L	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	--	--	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	13.3 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Volatile Organic Compounds - Continued</b>										
chlorobenzene	E611D	0.50	µg/L	<0.50	1.3 µg/L	--	--	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	1.8 µg/L	--	--	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	--	--	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	0.7 µg/L	--	--	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	150 µg/L	--	--	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	26 µg/L	--	--	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	100 µg/L	--	--	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	98.1 µg/L	--	--	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	10000 µg/L	--	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	72 µg/L	--	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	111 µg/L	--	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	2 µg/L	--	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	21 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Volatile Organic Compounds - Continued</b>										
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	0.37 mg/L	--	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	0.002 mg/L	--	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	0.09 mg/L	--	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050	--	--	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	105	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	74.3	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	98.4	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
bromofluorobenzene, 4-	E611D	1.0	%	99.8	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.8	--	--	--	--	--	--
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	--	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.010	5.8 µg/L	--	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
acridine	E641A-L	0.010	µg/L	<0.012	<sup>DLM</sup> 4.4 µg/L	--	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.010	0.012 µg/L	--	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	0.018 µg/L	--	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	0.015 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-001 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Polycyclic Aromatic Hydrocarbons - Continued</b>										
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	--	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	<0.010	0.04 µg/L	--	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.010	3 µg/L	--	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	1.1 µg/L	--	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.010	0.4 µg/L	--	--	--	--	--
pyrene	E641A-L	0.010	µg/L	0.022	0.025 µg/L	--	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.017	DLM 3.4 µg/L	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene-d12	E641A-L	0.1	%	92.9	--	--	--	--	--	--
naphthalene-d8	E641A-L	0.1	%	82.1	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	109	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	--	--	--	--	--
decachlorobiphenyl	E687	0.1	%	104	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	85.6	--	--	--	--	--	--



Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
PLCS	Water	aluminum, total		CCME	FAL-LT	0.0189 mg/L	0.005 mg/L
	Water	iron, total		CCME	FAL-LT	0.360 mg/L	0.3 mg/L
	Water	aluminum, dissolved		CCME	FAL-LT	0.0098 mg/L	0.005 mg/L
	Water	iron, dissolved		CCME	FAL-LT	0.393 mg/L	0.3 mg/L
	Water	phosphorus, total		NFLDW&S	SCH A	<0.050	0.0005 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2200073-001	PLCS	N/A: Not Applicable (mTPH < LOR)

**Key:**

- CCME Canada CCME Canadian Environmental Quality Guidelines (SEP, 2021)
- FAL-LT Freshwater Aquatic Life (Long Term)
- FAL-ST Freshwater Aquatic Life (Short Term)
- NFLDW&S Newfoundland And Labrador Regulation 65/03
- SCH A Newfoundland and Labrador Discharge to Water (Schedule A - 65/03)



## Analytical Results

Analyte	Method	LOR	Unit	Client sample ID	SLCS	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
				Sampling date/time	21-Dec-2022 00:00						
Sub-Matrix: Water (Matrix: Water)				HA2200073-002							
<b>Physical Tests</b>											
alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	529		--	--	--	--	--	--
alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0		--	--	--	--	--	--
alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0		--	--	--	--	--	--
alkalinity, total (as CaCO3)	E290	1.0	mg/L	434		--	--	--	--	--	--
colour, apparent	E330	2.0	CU	1100	DLM	--	--	--	--	--	--
conductivity	E100	1.0	µS/cm	893		--	--	--	--	--	--
hardness (as CaCO3), from total Ca/Mg	EC100A	0.50	mg/L	428		--	--	--	--	--	--
Langelier index (@ 20°C)	EC105A	0.010	-	0.440		--	--	--	--	--	--
Langelier index (@ 4°C)	EC105A	0.010	-	0.192		--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105A	0.010	pH units	6.74		--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105A	0.010	pH units	6.99		--	--	--	--	--	--
pH	E108	0.10	pH units	7.18		<b>6.5 - 9 pH units</b>	--	<b>5.5 - 9 pH units</b>	--	--	--
solids, total dissolved [TDS]	E162	10	mg/L	539	DLDS	--	--	<b>1000 mg/L</b>	--	--	--
turbidity	E121	0.10	NTU	206		--	--	--	--	--	--
<b>Anions and Nutrients</b>											
ammonia, total (as N)	E298	0.0050	mg/L	0.954	DLHC	--	--	<b>2 mg/L</b>	--	--	--
chloride	E235.Cl	0.50	mg/L	34.2		120 mg/L	--	--	--	--	--
fluoride	E235.F	0.020	mg/L	0.057		0.12 mg/L	--	--	--	--	--
nitrate (as N)	E235.NO3	0.020	mg/L	<0.020		<b>3 mg/L</b>	--	<b>10 mg/L</b>	--	--	--
nitrate + nitrite (as N)	EC235.N+N	0.0032	mg/L	<0.0224		--	--	<b>10 mg/L</b>	--	--	--
nitrite (as N)	E235.NO2	0.010	mg/L	<0.010		0.06 mg/L	--	--	--	--	--
phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010		--	--	--	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	8.46		--	--	--	--	--	--
<b>Cyanides</b>											
cyanide, strong acid dissociable (total)	E333	0.0050	mg/L	<0.0050		--	--	<b>0.025 mg/L</b>	--	--	--
<b>Organic / Inorganic Carbon</b>											
carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	18.8		--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Total Sulfides</b>										
sulfide, total (as H2S)	E396	0.019	mg/L	0.022	--	--	--	--	--	--
sulfide, total (as S)	E396	0.018	mg/L	0.021	--	--	0.5 mg/L	--	--	--
<b>Bioassays</b>										
trout bioassay LC50	TRT-LC50-96		-	See attached	--	--	--	--	--	--
<b>Ion Balance</b>										
anion sum	EC101A	0.10	meq/L	9.82	--	--	--	--	--	--
cation sum (total)	EC101A	0.10	meq/L	10.9	--	--	--	--	--	--
ion balance (cations/anions)	EC101A	0.01	%	111	--	--	--	--	--	--
<b>Total Metals</b>										
aluminum, total	E420	0.0030	mg/L	<0.0300 DLHC	0.005 mg/L	--	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
arsenic, total	E420	0.00010	mg/L	<0.00100 DLHC	0.005 mg/L	--	0.5 mg/L	--	--	--
barium, total	E420	0.00010	mg/L	0.110 DLHC	--	--	5 mg/L	--	--	--
beryllium, total	E420	0.000020	mg/L	<0.000200 DLHC	--	--	--	--	--	--
bismuth, total	E420	0.000050	mg/L	<0.000500 DLHC	--	--	--	--	--	--
boron, total	E420	0.010	mg/L	1.62 DLHC	--	--	5 mg/L	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.0000400 DLHC DLM DL	4E-05 mg/L	--	0.05 mg/L	--	--	--
calcium, total	E420	0.100	mg/L	126 DLHC	--	--	--	--	--	--
cesium, total	E420	0.000010	mg/L	0.000113 DLHC	--	--	--	--	--	--
chromium, total	E420	0.00050	mg/L	<0.00250 DLHC DLM DL	0.001 mg/L	--	--	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
copper, total	E420	0.00050	mg/L	<0.00200 DLHC DLM DL	0.002 mg/L	--	0.3 mg/L	--	--	--
iron, total	E420	0.010	mg/L	22.1 DLHC	0.3 mg/L	--	10 mg/L	--	--	--
lead, total	E420	0.000050	mg/L	<0.000500 DLHC	0.001 mg/L	--	0.2 mg/L	--	--	--
lithium, total	E420	0.0010	mg/L	<0.0100 DLHC	--	--	--	--	--	--
magnesium, total	E420	0.0050	mg/L	27.6 DLHC	--	--	--	--	--	--
manganese, total	E420	0.00010	mg/L	7.28 DLHC	0.2 mg/L	2 mg/L	--	--	--	--
mercury, total	E508	0.0000050	mg/L	0.0000050	2.6E-05 mg/L	--	0.005 mg/L	--	--	--
molybdenum, total	E420	0.000050	mg/L	<0.000500 DLHC	0.073 mg/L	--	--	--	--	--
nickel, total	E420	0.00050	mg/L	<0.00500 DLHC	0.025 mg/L	--	0.5 mg/L	--	--	--
phosphorus, total	E420	0.050	mg/L	<0.500 DLHC	--	--	0.0005 mg/L	--	--	--
potassium, total	E420	0.050	mg/L	7.47 DLHC	--	--	--	--	--	--
rubidium, total	E420	0.00020	mg/L	0.0153 DLHC	--	--	--	--	--	--
selenium, total	E420	0.000050	mg/L	<0.000500 DLHC	0.001 mg/L	--	0.01 mg/L	--	--	--
silicon (as SiO2), total	EC420.SiO2	0.25	mg/L	15.6	--	--	--	--	--	--
silicon, total	E420	0.10	mg/L	7.31 DLHC	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Total Metals - Continued</b>										
silver, total	E420	0.000010	mg/L	<0.000100 DLHC	0.00025 mg/L	--	0.05 mg/L	--	--	--
sodium, total	E420	0.050	mg/L	24.7 DLHC	--	--	--	--	--	--
strontium, total	E420	0.00020	mg/L	0.375 DLHC	--	--	--	--	--	--
sulfur, total	E420	0.50	mg/L	<5.00 DLHC	--	--	--	--	--	--
tellurium, total	E420	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
thallium, total	E420	0.000010	mg/L	<0.000100 DLHC	0.0008 mg/L	--	--	--	--	--
thorium, total	E420	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
tin, total	E420	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
titanium, total	E420	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
tungsten, total	E420	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
uranium, total	E420	0.000010	mg/L	0.000331 DLHC	--	--	--	--	--	--
vanadium, total	E420	0.00050	mg/L	<0.00500 DLHC	--	--	--	--	--	--
zinc, total	E420	0.0030	mg/L	<0.0070 DLHC DLM DL	0.007 mg/L	0.037 mg/L	0.5 mg/L	--	--	--
zirconium, total	E420	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
<b>Dissolved Metals</b>										
aluminum, dissolved	E421	0.0010	mg/L	0.0198 DLHC	0.005 mg/L	--	--	--	--	--
antimony, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
arsenic, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	0.005 mg/L	--	--	--	--	--
barium, dissolved	E421	0.00010	mg/L	0.0976 DLHC	--	--	--	--	--	--
beryllium, dissolved	E421	0.000020	mg/L	<0.000200 DLHC	--	--	--	--	--	--
bismuth, dissolved	E421	0.000050	mg/L	<0.000500 DLHC	--	--	--	--	--	--
boron, dissolved	E421	0.010	mg/L	1.52 DLHC	--	--	--	--	--	--
cadmium, dissolved	E421	0.0000050	mg/L	<0.0000400 DLHC DLM DL	4E-05 mg/L	--	--	--	--	--
calcium, dissolved	E421	0.050	mg/L	125 DLHC	--	--	--	--	--	--
cesium, dissolved	E421	0.000010	mg/L	0.000111 DLHC	--	--	--	--	--	--
chromium, dissolved	E421	0.00050	mg/L	<0.00100 DLHC DLM DL	0.001 mg/L	--	--	--	--	--
cobalt, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
copper, dissolved	E421	0.00020	mg/L	<0.00200 DLHC	0.002 mg/L	--	--	--	--	--
iron, dissolved	E421	0.010	mg/L	17.7 DLHC	0.3 mg/L	--	--	--	--	--
lead, dissolved	E421	0.000050	mg/L	<0.000500 DLHC	0.001 mg/L	--	--	--	--	--
lithium, dissolved	E421	0.0010	mg/L	<0.0100 DLHC	--	--	--	--	--	--
magnesium, dissolved	E421	0.0050	mg/L	24.6 DLHC	--	--	--	--	--	--
manganese, dissolved	E421	0.00010	mg/L	6.83 DLHC	0.2 mg/L	2 mg/L	--	--	--	--
mercury, dissolved	E509	0.0000050	mg/L	<0.0000050	2.6E-05 mg/L	--	--	--	--	--
molybdenum, dissolved	E421	0.000050	mg/L	<0.000500 DLHC	0.073 mg/L	--	--	--	--	--
nickel, dissolved	E421	0.00050	mg/L	<0.00500 DLHC	0.025 mg/L	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Dissolved Metals - Continued</b>										
phosphorus, dissolved	E421	0.050	mg/L	<0.500 DLHC	--	--	--	--	--	--
potassium, dissolved	E421	0.050	mg/L	7.37 DLHC	--	--	--	--	--	--
rubidium, dissolved	E421	0.00020	mg/L	0.0160 DLHC	--	--	--	--	--	--
selenium, dissolved	E421	0.000050	mg/L	<0.000500 DLHC	0.001 mg/L	--	--	--	--	--
silicon, dissolved	E421	0.050	mg/L	7.39 DLHC	--	--	--	--	--	--
silver, dissolved	E421	0.000010	mg/L	<0.000100 DLHC	0.00025 mg/L	--	--	--	--	--
sodium, dissolved	E421	0.050	mg/L	24.1 DLHC	--	--	--	--	--	--
strontium, dissolved	E421	0.00020	mg/L	0.345 DLHC	--	--	--	--	--	--
sulfur, dissolved	E421	0.50	mg/L	<5.00 DLHC	--	--	--	--	--	--
tellurium, dissolved	E421	0.00020	mg/L	<0.00200 DLHC	--	--	--	--	--	--
thallium, dissolved	E421	0.000010	mg/L	<0.000100 DLHC	0.0008 mg/L	--	--	--	--	--
thorium, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
tin, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
titanium, dissolved	E421	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
tungsten, dissolved	E421	0.00010	mg/L	<0.00100 DLHC	--	--	--	--	--	--
uranium, dissolved	E421	0.000010	mg/L	0.000339 DLHC	--	--	--	--	--	--
vanadium, dissolved	E421	0.00050	mg/L	<0.00500 DLHC	--	--	--	--	--	--
zinc, dissolved	E421	0.0010	mg/L	<0.0070 DLHC DLMDL	0.007 mg/L	0.037 mg/L	--	--	--	--
zirconium, dissolved	E421	0.00030	mg/L	<0.00300 DLHC	--	--	--	--	--	--
dissolved mercury filtration location	EP509		-	Field	--	--	--	--	--	--
dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Speciated Metals</b>										
chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	0.05 mg/L	--	--	--
chromium, trivalent [Cr III], total	EC535	0.00050	mg/L	<0.00050	--	--	1 mg/L	--	--	--
<b>Aggregate Organics</b>										
phenols, total (4AAP)	E562	0.0010	mg/L	<0.0010	0.004 mg/L	--	0.1 mg/L	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	--	--	--	--	--
bromodichloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromoform	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
bromomethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
carbon tetrachloride	E611D	0.20	µg/L	<0.20	13.3 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Volatile Organic Compounds - Continued</b>										
chlorobenzene	E611D	0.50	µg/L	<0.50	1.3 µg/L	--	--	--	--	--
chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
chloroform	E611D	0.50	µg/L	<0.50	1.8 µg/L	--	--	--	--	--
chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
dibromochloromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	--	--	--	--	--
dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	0.7 µg/L	--	--	--	--	--
dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	150 µg/L	--	--	--	--	--
dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	26 µg/L	--	--	--	--	--
dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	100 µg/L	--	--	--	--	--
dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloromethane	E611D	1.0	µg/L	<1.0	98.1 µg/L	--	--	--	--	--
dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
hexane, n-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	--	--	--	--	--
methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	10000 µg/L	--	--	--	--	--
styrene	E611D	0.50	µg/L	<0.50	72 µg/L	--	--	--	--	--
tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethane, 1,1,1,2,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
tetrachloroethylene	E611D	0.50	µg/L	<0.50	111 µg/L	--	--	--	--	--
toluene	E611D	0.50	µg/L	<0.50	2 µg/L	--	--	--	--	--
trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trichloroethylene	E611D	0.50	µg/L	<0.50	21 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Volatile Organic Compounds - Continued</b>										
trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
vinyl chloride	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
benzene	E611A	0.00050	mg/L	<0.00050	0.37 mg/L	--	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	32	--	--	--	--	--	--
toluene	E611A	0.00050	mg/L	<0.00050	0.002 mg/L	--	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	52	--	--	--	--	--	--
ethylbenzene	E611A	0.00050	mg/L	<0.00050	0.09 mg/L	--	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	15	--	--	--	--	--	--
xylenes, total	E611A	0.00050	mg/L	<0.00050	--	--	--	--	--	--
xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	104	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	86.8	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	86.3	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
bromofluorobenzene, 4-	E611D	1.0	%	100	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	99.3	--	--	--	--	--	--
EPH >C10-C16	E601F	0.050	mg/L	0.155	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	0.252	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	0.074	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	NR	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	0.481	--	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	0.481	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	E641A-L	0.010	µg/L	<0.101 <sup>DLM</sup>	5.8 µg/L	--	--	--	--	--
acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
acridine	E641A-L	0.010	µg/L	0.190	4.4 µg/L	--	--	--	--	--
anthracene	E641A-L	0.010	µg/L	<0.116 <sup>DLM</sup>	0.012 µg/L	--	--	--	--	--
benz(a)anthracene	E641A-L	0.010	µg/L	0.042	0.018 µg/L	--	--	--	--	--
benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	0.015 µg/L	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2200073-002 (Continued)	CCME FAL-LT	CCME FAL-ST	NFLDW&S SCH A			
<b>Polycyclic Aromatic Hydrocarbons - Continued</b>										
benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
chrysene	E641A-L	0.010	µg/L	0.054	--	--	--	--	--	--
dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	--	--	--	--	--
fluoranthene	E641A-L	0.010	µg/L	0.150	0.04 µg/L	--	--	--	--	--
fluorene	E641A-L	0.010	µg/L	<0.056	DLM 3 µg/L	--	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	0.015	--	--	--	--	--	--
methylnaphthalene, 1-	E641A-L	0.010	µg/L	0.015	--	--	--	--	--	--
methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
naphthalene	E641A-L	0.010	µg/L	<0.010	1.1 µg/L	--	--	--	--	--
perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
phenanthrene	E641A-L	0.010	µg/L	<0.019	DLM 0.4 µg/L	--	--	--	--	--
pyrene	E641A-L	0.010	µg/L	0.890	0.025 µg/L	--	--	--	--	--
quinoline	E641A-L	0.010	µg/L	<0.037	DLM 3.4 µg/L	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	0.011	--	--	--	--	--	--
chrysene-d12	E641A-L	0.1	%	94.7	--	--	--	--	--	--
naphthalene-d8	E641A-L	0.1	%	89.8	--	--	--	--	--	--
phenanthrene-d10	E641A-L	0.1	%	105	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	--	--	--	--	--
decachlorobiphenyl	E687	0.1	%	73.8	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	88.7	--	--	--	--	--	--



Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
SLCS	Water	aluminum, total		CCME	FAL-LT	<0.0300	0.005 mg/L
	Water	chromium, total		CCME	FAL-LT	<0.00250	0.001 mg/L
	Water	iron, total		CCME	FAL-LT	22.1 mg/L	0.3 mg/L
	Water	manganese, total		CCME	FAL-LT	7.28 mg/L	0.2 mg/L
	Water	aluminum, dissolved		CCME	FAL-LT	0.0198 mg/L	0.005 mg/L
	Water	iron, dissolved		CCME	FAL-LT	17.7 mg/L	0.3 mg/L
	Water	manganese, dissolved		CCME	FAL-LT	6.83 mg/L	0.2 mg/L
	Water	anthracene		CCME	FAL-LT	<0.116	0.012 µg/L
	Water	benz(a)anthracene		CCME	FAL-LT	0.042 µg/L	0.018 µg/L
	Water	fluoranthene		CCME	FAL-LT	0.150 µg/L	0.04 µg/L
	Water	pyrene		CCME	FAL-LT	0.890 µg/L	0.025 µg/L
	Water	manganese, total		CCME	FAL-ST	7.28 mg/L	2 mg/L
	Water	manganese, dissolved		CCME	FAL-ST	6.83 mg/L	2 mg/L
	Water	iron, total		NFLDW&S	SCH A	22.1 mg/L	10 mg/L
	Water	phosphorus, total		NFLDW&S	SCH A	<0.500	0.0005 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2200073-002	SLCS	NR: No Resemblance to Petroleum Hydrocarbons

- Key:**
- CCME Canada CCME Canadian Environmental Quality Guidelines (SEP, 2021)
  - FAL-LT Freshwater Aquatic Life (Long Term)
  - FAL-ST Freshwater Aquatic Life (Short Term)
  - NFLDW&S Newfoundland And Labrador Regulation 65/03
  - SCH A Newfoundland and Labrador Discharge to Water (Schedule A - 65/03)

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: HA2200073</b>	<b>Page</b>	: 1 of 26
<b>Amendment</b>	<b>: 1</b>		
<b>Client</b>	: Englobe Corp.	<b>Laboratory</b>	: Halifax - Environmental
<b>Contact</b>	: Mike Smith	<b>Account Manager</b>	: Emily Smith
<b>Address</b>	: Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9	<b>Address</b>	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
<b>Telephone</b>	:	<b>Telephone</b>	: +1 902 483 5298
<b>Project</b>	: 2210292.000	<b>Date Samples Received</b>	: 22-Dec-2022 10:00
<b>PO</b>	: ---	<b>Date Analysis Commenced</b>	: 21-Dec-2022
<b>C-O-C number</b>	: ---	<b>Issue Date</b>	: 11-Jan-2023 17:32
<b>Sampler</b>	: ---                    709-576-8148		
<b>Site</b>	: ---		
<b>Quote number</b>	: Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills		
<b>No. of samples received</b>	: 2		
<b>No. of samples analysed</b>	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Emily Smith	Project Manager	Avalon Laboratories Inc. External Subcontracting, St. John's, Newfoundland and Labrador
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario

Page : 2 of 26  
Work Order : HA2200073 Amendment 1  
Client : Englobe Corp.  
Project : 2210292.000



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 787360)</b>											
HA2200072-001	Anonymous	pH	----	E108	0.10	pH units	7.11	7.12	0.140%	4%	----
<b>Physical Tests (QC Lot: 787361)</b>											
HA2200072-001	Anonymous	conductivity	----	E100	1.0	µS/cm	178	177	0.844%	10%	----
<b>Physical Tests (QC Lot: 787362)</b>											
HA2200072-001	Anonymous	alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1.0	mg/L	60.6	65.1	7.25%	20%	----
<b>Physical Tests (QC Lot: 787797)</b>											
HA2200072-001	Anonymous	colour, apparent	----	E330	20.0	CU	2150	2170	0.810%	20%	----
<b>Physical Tests (QC Lot: 788162)</b>											
HA2200072-001	Anonymous	turbidity	----	E121	0.10	NTU	345	343	0.582%	15%	----
<b>Physical Tests (QC Lot: 789399)</b>											
HA2200073-001	PLCS	solids, total dissolved [TDS]	----	E162	20	mg/L	251	247	1.81%	20%	----
<b>Anions and Nutrients (QC Lot: 787355)</b>											
HA2200072-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.026	0.023	0.002	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787356)</b>											
HA2200072-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.044	0.042	0.002	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787357)</b>											
HA2200072-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 787358)</b>											
HA2200072-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	9.97	9.90	0.679%	20%	----
<b>Anions and Nutrients (QC Lot: 787359)</b>											
HA2200072-001	Anonymous	sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.30	mg/L	11.6	11.5	0.434%	20%	----
<b>Anions and Nutrients (QC Lot: 787587)</b>											
HA2200072-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 789689)</b>											
HA2200073-001	PLCS	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.139	0.139	0.144%	20%	----
<b>Cyanides (QC Lot: 789519)</b>											
CG2217495-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 789201)</b>											
HA2200069-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	0.54	0.04	Diff <2x LOR	----





Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Sulfides (QC Lot: 787844)</b>											
EO2211027-001	Anonymous	sulfide, total (as S)	18496-25-8	E396	1.80	mg/L	4.31	2.13	2.18	Diff <2x LOR	----
<b>Total Metals (QC Lot: 788067)</b>											
HA2200073-001	PLCS	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 788597)</b>											
WT2225891-009	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00145	0.00145	0.138%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.287	0.285	0.471%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.021	0.021	0.0005	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000145	0.0000150	0.0000005	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	105	102	3.52%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00059	0.00056	0.00003	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	2.30	2.31	0.449%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000188	0.000190	0.000003	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0036	0.0032	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	24.9	25.1	0.690%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0567	0.0563	0.756%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000792	0.000776	2.10%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	12.4	12.4	0.409%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00104	0.00103	0.000010	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	5.71	5.92	3.52%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	26.2	26.1	0.416%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.434	0.444	2.17%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	12.7	12.6	0.786%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



Sub-Matrix: **Water** *Laboratory Duplicate (DUP) Report*

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Metals (QC Lot: 788597) - continued</b>											
WT2225891-009	Anonymous	thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000647	0.000644	0.480%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0084	0.0084	0.00002	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 787811)</b>											
WT2225934-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0018	0.0016	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00029	0.00028	0.00002	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.109	0.111	1.96%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.211	0.212	0.471%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	150	152	1.02%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00072	0.00072	0.000006	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00100	0.00098	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.015	0.015	0.00001	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000084	0.000074	0.000010	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	0.0010	0.00004	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.4	11.7	2.22%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.455	0.454	0.316%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000062	0.000057	0.000004	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00204	0.00204	0.000008	Diff <2x LOR	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----		
potassium, dissolved	7440-09-7	E421	0.050	mg/L	9.12	9.08	0.409%	20%	----		
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00031	0.00032	0.000004	Diff <2x LOR	----		
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	0.000060	0.000010	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Dissolved Metals (QC Lot: 787811) - continued</b>											
WT2225934-001	Anonymous	silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.60	3.56	1.08%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	115	114	0.893%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.416	0.415	0.230%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.6	10.2	3.60%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000523	0.000522	0.153%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----		
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----		
<b>Dissolved Metals (QC Lot: 788023)</b>											
HA2200073-001	PLCS	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	0.0000052	<0.0000050	0.0000002	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 789161)</b>											
HA2200072-004	Anonymous	chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 789690)</b>											
HA2200073-002	SLCS	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	0.0013	0.0003	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 788079)</b>											
HA2200073-001	PLCS	benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 788080)</b>											
HA2200073-001	PLCS	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 788080) - continued</b>											
HA2200073-001	PLCS	carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611D	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 788080) - continued</b>											
HA2200073-001	PLCS	trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Hydrocarbons (QC Lot: 788078)</b>											
HA2200073-001	PLCS	VPH C6-C10	n/a	E581.VPH	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 787361)</b>						
conductivity	---	E100	1	µS/cm	<1.0	---
<b>Physical Tests (QCLot: 787362)</b>						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLot: 787797)</b>						
colour, apparent	---	E330	2	CU	<2.0	---
<b>Physical Tests (QCLot: 788162)</b>						
turbidity	---	E121	0.1	NTU	<0.10	---
<b>Physical Tests (QCLot: 789399)</b>						
solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Anions and Nutrients (QCLot: 787355)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 787356)</b>						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 787357)</b>						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 787358)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 787359)</b>						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 787587)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 789689)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Cyanides (QCLot: 789519)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Sulfides (QCLot: 787844)</b>						
sulfide, total (as S)	18496-25-8	E396	0.018	mg/L	<0.018	---
<b>Total Metals (QCLot: 788067)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Total Metals (QCLot: 788597)</b>						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>						
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 787811)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----





Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>						
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 788023)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
<b>Speciated Metals (QCLot: 789161)</b>						
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
<b>Aggregate Organics (QCLot: 789690)</b>						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	----
chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
chloromethane	74-87-3	E611D	2	µg/L	<2.0	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>						
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
hexanone, 2-	591-78-6	E611D	20	µg/L	<20	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	<0.50	----
<b>Hydrocarbons (QCLot: 788078)</b>						
VPH C6-C10	n/a	E581.VPH	25	µg/L	<25	----
<b>Hydrocarbons (QCLot: 789756)</b>						
EPH >C10-C16	n/a	E601F	50	µg/L	<50	----
EPH >C16-C21	n/a	E601F	50	µg/L	<50	----
EPH >C21-C32	n/a	E601F	50	µg/L	<50	----
EPH >C34-C50	n/a	E601F	100	µg/L	<100	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 789649)</b>						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 789649) - continued</b>						
acenaphthene	83-32-9	E641A-L	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A-L	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A-L	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A-L	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A-L	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A-L	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A-L	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A-L	0.01	µg/L	<0.010	----
perylene	198-55-0	E641A-L	0.01	µg/L	<0.010	----
phenanthrene	85-01-8	E641A-L	0.01	µg/L	<0.010	----
pyrene	129-00-0	E641A-L	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A-L	0.01	µg/L	<0.010	----
<b>Polychlorinated Biphenyls (QCLot: 790062)</b>						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 787360)</b>									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
<b>Physical Tests (QCLot: 787361)</b>									
conductivity	----	E100	1	µS/cm	1409 µS/cm	103	90.0	110	----
<b>Physical Tests (QCLot: 787362)</b>									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	103	85.0	115	----
<b>Physical Tests (QCLot: 787797)</b>									
colour, apparent	----	E330	2	CU	25 CU	105	70.0	130	----
<b>Physical Tests (QCLot: 788162)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	95.4	85.0	115	----
<b>Physical Tests (QCLot: 789399)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.3	85.0	115	----
<b>Anions and Nutrients (QCLot: 787355)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	106	90.0	110	----
<b>Anions and Nutrients (QCLot: 787356)</b>									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100.0	90.0	110	----
<b>Anions and Nutrients (QCLot: 787357)</b>									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
<b>Anions and Nutrients (QCLot: 787358)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 787359)</b>									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.5	90.0	110	----
<b>Anions and Nutrients (QCLot: 787587)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.0212 mg/L	103	80.0	120	----
<b>Anions and Nutrients (QCLot: 789689)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	109	85.0	115	----
<b>Cyanides (QCLot: 789519)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	89.6	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Sulfides (QCLot: 787844)</b>									
sulfide, total (as S)	18496-25-8	E396	0.018	mg/L	0.1124 mg/L	86.3	75.0	125	----
<b>Total Metals (QCLot: 788067)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	108	80.0	120	----
<b>Total Metals (QCLot: 788597)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	107	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	114	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.0125 mg/L	112	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	101	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	108	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	98.3	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.0025 mg/L	110	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	108	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	108	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	106	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	109	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	109	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.0125 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	110	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	107	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	104	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	107	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	111	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	113	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	113	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	106	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	101	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	111	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.0125 mg/L	112	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	99.5	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	106	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>									
thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	110	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	106	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	105	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	106	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	108	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.00025 mg/L	112	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	109	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	120	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	105	80.0	120	----
<b>Dissolved Metals (QCLot: 787811)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	108	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	99.4	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	95.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	93.6	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	99.7	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	104	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	101	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	102	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	90.5	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	117	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	99.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	101	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	107	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	104	60.0	140	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>									
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	90.7	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	112	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	97.3	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	100	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	102	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	98.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	106	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	104	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	99.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	94.7	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	98.6	80.0	120	----
<b>Speciated Metals (QCLot: 789161)</b>									
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	96.2	80.0	120	----
<b>Aggregate Organics (QCLot: 789690)</b>									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	91.9	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	95.3	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	95.3	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	94.8	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	93.9	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	110	70.0	130	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	95.4	70.0	130	----
bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	87.0	70.0	130	----
bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	104	60.0	140	----
carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	108	70.0	130	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	101	70.0	130	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	91.7	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>									
chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	100	60.0	140	----
chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	94.2	70.0	130	----
chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	101	60.0	140	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	91.7	70.0	130	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	97.1	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	92.4	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	95.7	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	95.2	70.0	130	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	94.4	60.0	140	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	98.6	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	92.9	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	93.0	70.0	130	----
dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	104	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	93.8	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	92.9	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	95.6	70.0	130	----
hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	93.6	70.0	130	----
hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	84.5	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	98.4	70.0	130	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	89.5	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	97.9	70.0	130	----
styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	94.6	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	92.5	70.0	130	----
tetrachloroethane, 1,1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	84.3	70.0	130	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	99.0	70.0	130	----
toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	95.3	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	96.9	70.0	130	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	98.6	70.0	130	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	107	60.0	140	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	100 µg/L	100	60.0	140	----
<b>Hydrocarbons (QCLot: 788078)</b>									
VPH C6-C10	n/a	E581.VPH	25	µg/L	2000 µg/L	110	80.0	120	----





Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Hydrocarbons (QCLot: 789756)</b>									
EPH >C10-C16	n/a	E601F	50	µg/L	6290.168 µg/L	82.2	70.0	130	----
EPH >C16-C21	n/a	E601F	50	µg/L	2467.832 µg/L	89.2	70.0	130	----
EPH >C21-C32	n/a	E601F	50	µg/L	3685.411 µg/L	87.4	70.0	130	----
EPH >C34-C50	n/a	E601F	100	µg/L	5075.368 µg/L	88.2	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 789649)</b>									
acenaphthene	83-32-9	E641A-L	0.01	µg/L	0.5263 µg/L	85.3	50.0	140	----
acenaphthylene	208-96-8	E641A-L	0.01	µg/L	0.5263 µg/L	91.6	50.0	140	----
acridine	260-94-6	E641A-L	0.01	µg/L	0.5263 µg/L	93.0	50.0	140	----
anthracene	120-12-7	E641A-L	0.01	µg/L	0.5263 µg/L	90.2	50.0	140	----
benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	0.5263 µg/L	90.3	50.0	140	----
benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	0.5263 µg/L	83.8	50.0	140	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	0.5263 µg/L	84.1	50.0	140	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	0.5263 µg/L	87.8	50.0	140	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	0.5263 µg/L	85.2	50.0	140	----
chrysene	218-01-9	E641A-L	0.01	µg/L	0.5263 µg/L	99.5	50.0	140	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	0.5263 µg/L	72.0	50.0	140	----
fluoranthene	206-44-0	E641A-L	0.01	µg/L	0.5263 µg/L	101	50.0	140	----
fluorene	86-73-7	E641A-L	0.01	µg/L	0.5263 µg/L	92.2	50.0	140	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	0.5263 µg/L	89.9	50.0	140	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	0.5263 µg/L	79.3	50.0	140	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	0.5263 µg/L	89.5	50.0	140	----
naphthalene	91-20-3	E641A-L	0.01	µg/L	0.5263 µg/L	81.4	50.0	140	----
perylene	198-55-0	E641A-L	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
phenanthrene	85-01-8	E641A-L	0.01	µg/L	0.5263 µg/L	100	50.0	140	----
pyrene	129-00-0	E641A-L	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
quinoline	91-22-5	E641A-L	0.01	µg/L	0.5263 µg/L	117	50.0	140	----
<b>Polychlorinated Biphenyls (QCLot: 790062)</b>									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	97.2	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Polychlorinated Biphenyls (QCLot: 790062) - continued</b>									
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	124	60.0	140	----



### Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 787355)</b>										
HA2200072-001	Anonymous	fluoride	16984-48-8	E235.F	0.967 mg/L	1 mg/L	96.7	75.0	125	----
<b>Anions and Nutrients (QCLot: 787356)</b>										
HA2200072-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.44 mg/L	2.5 mg/L	97.8	75.0	125	----
<b>Anions and Nutrients (QCLot: 787357)</b>										
HA2200072-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.508 mg/L	0.5 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 787358)</b>										
HA2200072-001	Anonymous	chloride	16887-00-6	E235.Cl	99.3 mg/L	100 mg/L	99.3	75.0	125	----
<b>Anions and Nutrients (QCLot: 787359)</b>										
HA2200072-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	96.3 mg/L	100 mg/L	96.3	75.0	125	----
<b>Anions and Nutrients (QCLot: 787587)</b>										
HA2200072-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0191 mg/L	0.0196 mg/L	97.5	70.0	130	----
<b>Anions and Nutrients (QCLot: 789689)</b>										
HA2200073-001	PLCS	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
<b>Cyanides (QCLot: 789519)</b>										
CG2217495-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	2.08 mg/L	2.5 mg/L	83.3	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 789201)</b>										
HA2200069-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.65 mg/L	5 mg/L	113	70.0	130	----
<b>Total Sulfides (QCLot: 787844)</b>										
EO2211027-001	Anonymous	sulfide, total (as S)	18496-25-8	E396	ND mg/L	0.1124 mg/L	ND	65.0	135	----
<b>Total Metals (QCLot: 788067)</b>										
HA2200073-002	SLCS	mercury, total	7439-97-6	E508	0.0000950 mg/L	0.0001 mg/L	95.0	70.0	130	----
<b>Total Metals (QCLot: 788597)</b>										
WT2225891-010	Anonymous	aluminum, total	7429-90-5	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		antimony, total	7440-36-0	E420	0.0539 mg/L	0.05 mg/L	108	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0519 mg/L	0.05 mg/L	104	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.00465 mg/L	0.005 mg/L	93.0	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0470 mg/L	0.05 mg/L	94.0	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Total Metals (QCLot: 788597) - continued</b>										
WT2225891-010	Anonymous	boron, total	7440-42-8	E420	0.046 mg/L	0.05 mg/L	92.3	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00468 mg/L	0.005 mg/L	93.6	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00272 mg/L	0.0025 mg/L	109	70.0	130	----
		chromium, total	7440-47-3	E420	0.0126 mg/L	0.0125 mg/L	100	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0123 mg/L	0.0125 mg/L	98.1	70.0	130	----
		copper, total	7440-50-8	E420	0.0144 mg/L	0.0125 mg/L	115	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	0.05 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0239 mg/L	0.025 mg/L	95.7	70.0	130	----
		lithium, total	7439-93-2	E420	0.0127 mg/L	0.0125 mg/L	102	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0134 mg/L	0.0125 mg/L	108	70.0	130	----
		nickel, total	7440-02-0	E420	0.0236 mg/L	0.025 mg/L	94.3	70.0	130	----
		phosphorus, total	7723-14-0	E420	0.496 mg/L	0.5 mg/L	99.1	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.00513 mg/L	0.005 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0464 mg/L	0.05 mg/L	92.8	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	0.5 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00481 mg/L	0.005 mg/L	96.3	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.00448 mg/L	0.005 mg/L	89.6	70.0	130	----
		thallium, total	7440-28-0	E420	0.0489 mg/L	0.05 mg/L	97.8	70.0	130	----
		thorium, total	7440-29-1	E420	0.00500 mg/L	0.005 mg/L	100	70.0	130	----
		tin, total	7440-31-5	E420	0.0245 mg/L	0.025 mg/L	98.1	70.0	130	----
		titanium, total	7440-32-6	E420	0.0124 mg/L	0.0125 mg/L	99.0	70.0	130	----
		tungsten, total	7440-33-7	E420	0.00515 mg/L	0.005 mg/L	103	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0260 mg/L	0.025 mg/L	104	70.0	130	----
		zinc, total	7440-66-6	E420	0.0210 mg/L	0.025 mg/L	83.9	70.0	130	----
		zirconium, total	7440-67-7	E420	0.00544 mg/L	0.005 mg/L	109	70.0	130	----
<b>Dissolved Metals (QCLot: 787811)</b>										
WT2225934-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>										
WT2225934-002	Anonymous	antimony, dissolved	7440-36-0	E421	0.0508 mg/L	0.05 mg/L	102	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0620 mg/L	0.05 mg/L	124	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.00492 mg/L	0.005 mg/L	98.4	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0452 mg/L	0.05 mg/L	90.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.042 mg/L	0.05 mg/L	83.9	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00531 mg/L	0.005 mg/L	106	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00280 mg/L	0.0025 mg/L	112	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0131 mg/L	0.0125 mg/L	105	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0130 mg/L	0.0125 mg/L	104	70.0	130	----
		iron, dissolved	7439-89-6	E421	0.051 mg/L	0.05 mg/L	103	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0113 mg/L	0.0125 mg/L	90.4	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0128 mg/L	0.0125 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0254 mg/L	0.025 mg/L	101	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	0.629 mg/L	0.5 mg/L	126	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.00547 mg/L	0.005 mg/L	109	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	0.5 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00452 mg/L	0.005 mg/L	90.4	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.00590 mg/L	0.005 mg/L	118	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.00501 mg/L	0.005 mg/L	100	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0259 mg/L	0.025 mg/L	104	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.00503 mg/L	0.005 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0270 mg/L	0.025 mg/L	108	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 787811) - continued</b>										
WT2225934-002	Anonymous	zinc, dissolved	7440-66-6	E421	0.0266 mg/L	0.025 mg/L	106	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.00494 mg/L	0.005 mg/L	98.8	70.0	130	----
<b>Dissolved Metals (QCLot: 788023)</b>										
HA2200073-002	SLCS	mercury, dissolved	7439-97-6	E509	0.0000849 mg/L	0.0001 mg/L	84.9	70.0	130	----
<b>Speciated Metals (QCLot: 789161)</b>										
HA2200072-004	Anonymous	chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0381 mg/L	0.04 mg/L	95.4	70.0	130	----
<b>Aggregate Organics (QCLot: 789690)</b>										
HA2200073-002	SLCS	phenols, total (4AAP)	----	E562	0.0200 mg/L	0.02 mg/L	100	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 788079)</b>										
HA2200073-001	PLCS	benzene	71-43-2	E611A	89.0 µg/L	100 µg/L	89.0	60.0	140	----
		ethylbenzene	100-41-4	E611A	87.2 µg/L	100 µg/L	87.2	60.0	140	----
		toluene	108-88-3	E611A	88.4 µg/L	100 µg/L	88.4	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	174 µg/L	200 µg/L	86.8	60.0	140	----
		xylene, o-	95-47-6	E611A	88.0 µg/L	100 µg/L	88.0	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 788080)</b>										
HA2200073-001	PLCS	Acetone	67-64-1	E611D	123 µg/L	100 µg/L	123	60.0	140	----
		bromodichloromethane	75-27-4	E611D	97.7 µg/L	100 µg/L	97.7	60.0	140	----
		bromoform	75-25-2	E611D	95.9 µg/L	100 µg/L	95.9	60.0	140	----
		bromomethane	74-83-9	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		carbon disulfide	75-15-0	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		carbon tetrachloride	56-23-5	E611D	95.2 µg/L	100 µg/L	95.2	60.0	140	----
		chlorobenzene	108-90-7	E611D	87.7 µg/L	100 µg/L	87.7	60.0	140	----
		chloroethane	75-00-3	E611D	94.1 µg/L	100 µg/L	94.1	60.0	140	----
		chloroform	67-66-3	E611D	93.6 µg/L	100 µg/L	93.6	60.0	140	----
		chloromethane	74-87-3	E611D	92.3 µg/L	100 µg/L	92.3	60.0	140	----
		dibromochloromethane	124-48-1	E611D	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		dibromoethane, 1,2-	106-93-4	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	88.8 µg/L	100 µg/L	88.8	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611D	84.1 µg/L	100 µg/L	84.1	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	85.0 µg/L	100 µg/L	85.0	60.0	140	----
		dichlorodifluoromethane	75-71-8	E611D	80.9 µg/L	100 µg/L	80.9	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611D	94.3 µg/L	100 µg/L	94.3	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611D	94.8 µg/L	100 µg/L	94.8	60.0	140	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 788080) - continued</b>										
HA2200073-001	PLCS	dichloroethylene, cis-1,2-	156-59-2	E611D	95.7 µg/L	100 µg/L	95.7	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	86.2 µg/L	100 µg/L	86.2	60.0	140	----
		dichloromethane	75-09-2	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611D	94.0 µg/L	100 µg/L	94.0	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	93.4 µg/L	100 µg/L	93.4	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	93.8 µg/L	100 µg/L	93.8	60.0	140	----
		hexane, n-	110-54-3	E611D	83.5 µg/L	100 µg/L	83.5	60.0	140	----
		hexanone, 2-	591-78-6	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	95.8 µg/L	100 µg/L	95.8	60.0	140	----
		styrene	100-42-5	E611D	90.2 µg/L	100 µg/L	90.2	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611D	91.4 µg/L	100 µg/L	91.4	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		tetrachloroethylene	127-18-4	E611D	88.3 µg/L	100 µg/L	88.3	60.0	140	----
		toluene	108-88-3	E611D	88.4 µg/L	100 µg/L	88.4	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611D	93.6 µg/L	100 µg/L	93.6	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		trichloroethylene	79-01-6	E611D	93.0 µg/L	100 µg/L	93.0	60.0	140	----
		trichlorofluoromethane	75-69-4	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		vinyl chloride	75-01-4	E611D	89.8 µg/L	100 µg/L	89.8	60.0	140	----
<b>Hydrocarbons (QCLot: 788078)</b>										
HA2200073-001	PLCS	VPH C6-C10	n/a	E581.VPH	2040 µg/L	2000 µg/L	102	60.0	140	----




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : HA2200073</p> <p><b>Amendment</b> : 1</p> <p><b>Client</b> : Englobe Corp.</p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : ----</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 2</p> <p><b>No. of samples analysed</b> : 2</p>	<p><b>Page</b> : 1 of 17</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 22-Dec-2022 10:00</p> <p><b>Issue Date</b> : 11-Jan-2023 17:32</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

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### **Workorder Comments**

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### **Summary of Outliers**

#### **Outliers : Quality Control Samples**

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.



***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

***Outliers : Analysis Holding Time Compliance (Breaches)***

- Analysis Holding Time Outliers exist - please see following pages for full details.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Aggregate Organics : Phenols (4AAP) in Water by Colorimetry</b>										
Amber glass total (sulfuric acid) PLCS	E562	21-Dec-2022	28-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Aggregate Organics : Phenols (4AAP) in Water by Colorimetry</b>										
Amber glass total (sulfuric acid) SLCS	E562	21-Dec-2022	28-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) PLCS	E298	21-Dec-2022	28-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) SLCS	E298	21-Dec-2022	28-Dec-2022	----	----		29-Dec-2022	28 days	9 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE PLCS	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE SLCS	E235.Cl	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>										
HDPE PLCS	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	* EHT
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>										
HDPE SLCS	E378-U	21-Dec-2022	22-Dec-2022	----	----		28-Dec-2022	3 days	8 days	* EHT
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE PLCS	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE SLCS	E235.F	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE PLCS	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✓
<b>Anions and Nutrients : Nitrate in Water by IC</b>										
HDPE SLCS	E235.NO3	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✓
<b>Anions and Nutrients : Nitrite in Water by IC</b>										
HDPE PLCS	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✓
<b>Anions and Nutrients : Nitrite in Water by IC</b>										
HDPE SLCS	E235.NO2	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	3 days	2 days	✓
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
HDPE PLCS	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
HDPE SLCS	E235.SO4	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	28 days	2 days	✔
<b>Bioassays : Survival/LC50 Rainbow Trout (96 hours)</b>										
LDPE carboy PLCS	TRT-LC50-96	21-Dec-2022	----	----	----		21-Dec-2022	5 days	1 days	✔
<b>Bioassays : Survival/LC50 Rainbow Trout (96 hours)</b>										
LDPE carboy SLCS	TRT-LC50-96	21-Dec-2022	----	----	----		21-Dec-2022	5 days	1 days	✔
<b>Cyanides : Total Cyanide</b>										
HDPE - total (sodium hydroxide) PLCS	E333	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	14 days	8 days	✔
<b>Cyanides : Total Cyanide</b>										
HDPE - total (sodium hydroxide) SLCS	E333	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	14 days	8 days	✔
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
Glass vial dissolved (hydrochloric acid) PLCS	E509	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	28 days	2 days	✔
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
Glass vial dissolved (hydrochloric acid) SLCS	E509	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	28 days	2 days	✔
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>										
HDPE dissolved (nitric acid) PLCS	E421	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	180 days	2 days	✔
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>										
HDPE dissolved (nitric acid) SLCS	E421	21-Dec-2022	22-Dec-2022	----	----		22-Dec-2022	180 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) PLCS	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) SLCS	E611A	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) PLCS	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SLCS	E601F	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	03-Jan-2023	40 days	6 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) PLCS	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) SLCS	E581.VPH	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) PLCS	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) SLCS	E358-L	21-Dec-2022	28-Dec-2022	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE PLCS	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✔	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE SLCS	E290	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	14 days	3 days	✓	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE PLCS	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✓	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE SLCS	E330	21-Dec-2022	----	----	----		22-Dec-2022	48 hrs	44 hrs	✓	
<b>Physical Tests : Conductivity in Water</b>											
HDPE PLCS	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
HDPE SLCS	E100	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	28 days	3 days	✓	
<b>Physical Tests : pH by Meter</b>											
HDPE PLCS	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
HDPE SLCS	E108	21-Dec-2022	22-Dec-2022	----	----		23-Dec-2022	0.25 hrs	36 hrs	* EHTR-FM	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE PLCS	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✓	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE SLCS	E162	21-Dec-2022	----	----	----		28-Dec-2022	7 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE PLCS	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔	
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE SLCS	E121	21-Dec-2022	----	----	----		23-Dec-2022	3 days	2 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap PLCS	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap SLCS	E687	21-Dec-2022	29-Dec-2022	14 days	9 days	✔	29-Dec-2022	40 days	0 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) PLCS	E641A-L	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	30-Dec-2022	40 days	2 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) SLCS	E641A-L	21-Dec-2022	28-Dec-2022	14 days	8 days	✔	30-Dec-2022	40 days	2 days	✔	
<b>Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC</b>											
HDPE - total (sodium hydroxide) PLCS	E532	21-Dec-2022	----	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC</b>											
HDPE - total (sodium hydroxide) SLCS	E532	21-Dec-2022	----	----	----		28-Dec-2022	28 days	7 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
Glass vial total (hydrochloric acid) PLCS	E508	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Total Metals : Total Mercury in Water by CVAAS</b>										
<b>Glass vial total (hydrochloric acid)</b> SLCS	E508	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	28 days	2 days	✔
<b>Total Metals : Total metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> PLCS	E420	21-Dec-2022	23-Dec-2022	----	----		28-Dec-2022	180 days	8 days	✔
<b>Total Metals : Total metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> SLCS	E420	21-Dec-2022	23-Dec-2022	----	----		28-Dec-2022	180 days	8 days	✔
<b>Total Sulfides : Total Sulfide by Colourimetry (Manual)</b>										
<b>HDPE total (zinc acetate+sodium hydroxide)</b> PLCS	E396	21-Dec-2022	----	----	----		22-Dec-2022	7 days	2 days	✔
<b>Total Sulfides : Total Sulfide by Colourimetry (Manual)</b>										
<b>HDPE total (zinc acetate+sodium hydroxide)</b> SLCS	E396	21-Dec-2022	----	----	----		22-Dec-2022	7 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> PLCS	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> SLCS	E611D	21-Dec-2022	23-Dec-2022	----	----		23-Dec-2022	14 days	2 days	✔

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended  
 EHT: Exceeded ALS recommended hold time prior to analysis.  
 Rec. HT: ALS recommended hold time (see units).





## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	789689	1	15	6.6	5.0	✓
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✓
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✓
Conductivity in Water	E100	787361	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	788023	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✓
pH by Meter	E108	787360	1	16	6.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	789690	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✓
Total Cyanide	E333	789519	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	788067	1	8	12.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✓
Total Sulfide by Colourimetry (Manual)	E396	787844	1	3	33.3	5.0	✓
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✓
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	789689	1	15	6.6	5.0	✓
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✓
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✓
Conductivity in Water	E100	787361	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	788023	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✓



Matrix: **Water** Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
EPH by GC-FID (RBCA)	E601F	789756	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	789649	1	3	33.3	5.0	✓
PCB Aroclors by GC-MS	E687	790062	1	15	6.6	4.7	✓
pH by Meter	E108	787360	1	16	6.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	789690	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✓
Total Cyanide	E333	789519	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	788067	1	8	12.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✓
Total Sulfide by Colourimetry (Manual)	E396	787844	1	3	33.3	5.0	✓
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	787362	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	789689	1	15	6.6	5.0	✓
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✓
Colour (Apparent) by Spectrometer	E330	787797	1	12	8.3	5.0	✓
Conductivity in Water	E100	787361	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	788023	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✓
EPH by GC-FID (RBCA)	E601F	789756	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	789649	1	3	33.3	5.0	✓
PCB Aroclors by GC-MS	E687	790062	1	15	6.6	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	789690	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	789399	1	17	5.8	5.0	✓
Total Cyanide	E333	789519	1	20	5.0	5.0	✓



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	788067	1	8	12.5	5.0	✔
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✔
Total Sulfide by Colourimetry (Manual)	E396	787844	1	3	33.3	5.0	✔
Turbidity by Nephelometry	E121	788162	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✔
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	789689	1	15	6.6	5.0	✔
BTEX by Headspace GC-MS	E611A	788079	1	13	7.6	5.0	✔
Chloride in Water by IC	E235.Cl	787358	1	16	6.2	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	788023	1	14	7.1	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	787811	1	12	8.3	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	789201	1	15	6.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	787587	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	787355	1	10	10.0	5.0	✔
Nitrate in Water by IC	E235.NO3	787356	1	17	5.8	5.0	✔
Nitrite in Water by IC	E235.NO2	787357	1	17	5.8	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	789690	1	15	6.6	5.0	✔
Sulfate in Water by IC	E235.SO4	787359	1	16	6.2	5.0	✔
Total Cyanide	E333	789519	1	20	5.0	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	789161	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	788067	1	8	12.5	5.0	✔
Total metals in Water by CRC ICPMS	E420	788597	1	17	5.8	5.0	✔
Total Sulfide by Colourimetry (Manual)	E396	787844	1	3	33.3	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	788080	1	12	8.3	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	788078	1	17	5.8	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Waterloo - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Waterloo - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 Waterloo - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Waterloo - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Waterloo - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 Waterloo - Environmental	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters.  Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Cyanide	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis.  Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Waterloo - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Waterloo - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Sulfide by Colourimetry (Manual)	E396 Waterloo - Environmental	Water	APHA 4500-S2 D (mod)	Total Sulfide is determined by spectrophotometer using the methylene blue colourimetric method. Results expressed "as H <sub>2</sub> S" if reported represent the maximum possible H <sub>2</sub> S concentration based on the total sulfide concentration in the sample.  The H <sub>2</sub> S calculation converts Total Sulphide as (S <sup>2-</sup> ) and reports it as Total Sulphide as (H <sub>2</sub> S).
Total metals in Water by CRC ICPMS	E420 Waterloo - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Waterloo - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Mercury in Water by CVAAS	E508 Waterloo - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Waterloo - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Total Hexavalent Chromium (Cr VI) by IC	E532 Waterloo - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection.  Results are based on an un-filtered, field-preserved sample.
Phenols (4AAP) in Water by Colorimetry	E562 Waterloo - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K <sub>3</sub> Fe(CN) <sub>6</sub> ) and 4-amino-antipyrene (4-AAP) to form a red complex which is measured colorimetrically.
VPH by Headspace GC-FID (RBCA)	E581.VPH Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH by GC-FID (RBCA)	E601F Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.
BTEX by Headspace GC-MS	E611A Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L Waterloo - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Hardness (Calculated) from Total Ca/Mg	EC100A  Waterloo - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Total Metals	EC101A  Waterloo - Environmental	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Langelier Index using Laboratory pH (Ca-T)	EC105A  Waterloo - Environmental	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO <sub>3</sub> . Negative values indicate undersaturation of CaCO <sub>3</sub> . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N  Waterloo - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO <sub>2</sub>  Waterloo - Environmental	Water	N/A	Total Silicon (as SiO <sub>2</sub> ) is a calculated parameter. Total Silicon (as SiO <sub>2</sub> mg/L) = 2.139 x Total Silicon (mg/L).
Total Trivalent Chromium (Cr III) by Calculation	EC535  Waterloo - Environmental	Water	APHA 3030B/6020A/EPA 7196A (mod)	Chromium (III)-Total is calculated as the difference between the total chromium and the total hexavalent chromium (Cr(VI)) results. The Limit of Reporting for Chromium (III) varies as a function of the test results.
VPH C6-C10 (less BTEX) [RBCA]	EC580C  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Modified TPH (RBCA) Tier I	EC581D  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Modified TPH (PIRI), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) + (>C16 - C21) + (>C21 - C32).
Survival/LC50 Rainbow Trout (96 hours)	TRT-LC50-96  Avalon Laboratories Inc. - 5 Sea Rose Ave. St. John's Newfoundland and Labrador Canada A1A 0P6	Water	EPS1/RM/13	See attached report.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298  Waterloo - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358  Waterloo - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421  Waterloo - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509  Waterloo - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581  Waterloo - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601  Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
PHCs Hexane Extraction (RBCA)	EP601F  Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) are extracted using a hexane liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660  Waterloo - Environmental	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.





**BIOASSAY CERTIFICATE OF ANALYSIS**  
**Rainbow Trout LC<sub>50</sub>**

**Customer:** Costas Farassoglou  
ALS Canada Ltd.  
2103 Dollarton Hwy  
North Vancouver, BC, V7H 0A7  
613-225-8279 Ext. 377

**Report Date:** 05-Jan-23  
**Project Number:** 11468  
**Sample ID:** B22-1554  
**Report ID:** 10257

SAMPLE		SAMPLE CHARACTERIZATION	
Sample Material:	<b>PLCS (Englobe Corp.)</b>	Received Date & Time:	December 21, 2022 @ 3:05 PM
Sampling Method:	Grab	Temperature:	14.3°C
Sample Condition:	Received in acceptable condition	Dissolved Oxygen:	9.4 mg/L (101 %)
Collection Date & Time:	December 21, 2022 @ Not Provided	pH:	7.3 pH Units
Collected by:	Lisa C.	Conductivity:	349 µS/cm
Volume:	2 x 25L	Clarity/Colour:	Slightly cloudy, pale green
Storage:	0 hrs @ 15.0 ± 1.0 °C	Odour:	None
Arrival Temperature:	2.2°C	Suspended Solids:	None

DILUTION WATER CHARACTERIZATION		TEST CONDITIONS	
<b>MONTHLY AVERAGE</b>		Test Start Date & Time:	December 21, 2022 @ 5:00 PM
Source:	Municipal Dechlorinated	Test End Date & Time:	December 25, 2022 @ 5:00 PM
Temperature:	15.1 ± 0.5 °C	Protocol:	EPS 1/RM/13*
Dissolved Oxygen:	9.3 ± 0.3 mg/L	Type of Test:	96-hour static LC <sub>50</sub>
Conductivity:	140 ± 11 µS/cm	Volume of Test Solutions:	20 Liters
Hardness:	25 ± 0 mg/L	Photoperiod:	16h ± 1h Light/08h ± 1h Dark
pH:	7.2 ± 0.3 pH units	Light Intensity:	368 Lux
Monthly Data:	November 2022	Aeration Rate:	6.5 ± 1.0 mL/min.L <sup>-1</sup>
Date Revised:	November 30, 2022	Preaeration Time:	30 minutes
		Test Temperature:	15.0 ± 1.0 °C
		Performed by:	L. Joy/T. Bradbury/A. Woodrow/ D. Nash

TEST ORGANISM		REFERENCE TOXICITY TEST DATA (LOG SCALE)	
Species:	<i>Oncorhynchus mykiss</i> (Rainbow Trout)	Test Organism:	<i>Oncorhynchus mykiss</i>
Source:	Lyndon Fish Hatcheries	Toxicant:	Phenol
Batch Number:	22-11	Fish Batch No.:	22-11
Number per Tank:	10	Reference Toxicant Date:	November 25 - 29, 2022
% Mortality:	0.00 % (7 Days Prior to Testing)	LC <sub>50</sub> Value:	1.00 mg/L
Mean Fork Length (cm):	4.7 ± 0.3      Range: 3.9 – 5.0	95% Confidence Limits:	0.88 – 1.12 mg/L
Mean Total Weight (g):	1.0 ± 0.1      Range: 0.8 – 1.2	Historic Mean ± 2 SD:	0.92 ± 0.16 mg/L
Loading Density (g/L):	0.5	(Warning Limits)	

**BIOASSAY CERTIFICATE OF ANALYSIS**  
**Rainbow Trout LC<sub>50</sub>**

**Customer:** Costas Farassoglou  
 ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver, BC, V7H 0A7  
 613-225-8279 Ext. 377

**Report Date:** 05-Jan-23  
**Project Number:** 11468  
**Sample ID:** B22-1554  
**Report ID:** 10257

**TEST DATA**

Effluent Conc. (%)	Temp (°C)		D.O. (mg/L (%))		pH Units		Cond. (µs/cm)		Mortality (%)
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	
100	15.4	14.5	9.9 (99)	9.2 (95)	7.5	8.0	353	345	0
50	14.8	14.5	9.9 (98)	9.8 (99)	7.4	8.0	242	248	0
25	14.6	14.5	9.8 (97)	9.5 (98)	7.3	8.0	194	198	0
12.5	14.2	14.5	9.9 (99)	9.7 (98)	7.5	7.9	169	166	0
6.25	14.2	14.5	9.9 (100)	9.5 (96)	7.5	7.7	146	154	0
0	14.2	14.5	9.8 (100)	9.6 (98)	7.6	7.7	134	145	0

**TEST OBSERVATION**

Effluent Conc. (%)	100	All fish swimming with normal behavior
	50	
	25	
	12.5	
	6.25	
	0	

**TEST RESULT**



LC <sub>50</sub> value (static, acute) **: > 100 %	95% Confidence Intervals: 100.00 % - Infinity
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**COMMENTS**

- Sample has not been pH adjusted or filtered.
- \*The above analysis was conducted according to protocols indicated. Reference Method: For Determining Acute Lethality of Effluents to Rainbow Trout (Report EPS 1/RM/13 Second Edition, December 2000, May 2007, and February 2016 amendments), with the modification of initiating the Reference Toxicant prior to the completion of two-week acclimation period.
- The above results, which refer to the sample(s) tested as they were received only, are for your information and will be held in the strictest confidence by this firm.
- The report shall not be reproduced except in full without approval of the laboratory, as the laboratory cannot provide assurance that parts of the report are not taken out of context.
- Sample controls are considered a part of a sample test and as such are subject to the same treatment (this includes, but is not limited to, aeration and temperature testing requirements).
- \*\*The CETIS™ Program was used to calculate the LC<sub>50</sub> value using binomial analysis.

**VERIFICATION**

*This report and all data included within was reviewed and validated by the following individuals*

Technical Reviewer: 	Senior Reviewer: 
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**BIOASSAY CERTIFICATE OF ANALYSIS**  
**Rainbow Trout LC<sub>50</sub>**

**Customer:** Costas Farassoglou  
ALS Canada Ltd.  
2103 Dollarton Hwy  
North Vancouver, BC, V7H 0A7  
613-225-8279 Ext. 377

**Report Date:** 05-Jan-23  
**Project Number:** 11468  
**Sample ID:** B22-1555  
**Report ID:** 10258

SAMPLE		SAMPLE CHARACTERIZATION	
Sample Material:	<b>SLCS (Englobe Corp.)</b>	Received Date & Time:	December 21, 2022 @ 3:05 PM
Sampling Method:	Grab	Temperature:	15.9°C
Sample Condition:	Received in acceptable condition	Dissolved Oxygen:	8.5 mg/L (88 %)
Collection Date & Time:	December 21, 2022 @ Not Provided	pH:	6.9 pH Units
Collected by:	Lisa C.	Conductivity:	834 µS/cm
Volume:	2 x 25L	Clarity/Colour:	Cloudy, orange
Storage:	0 hrs @ 15.0 ± 1.0 °C	Odour:	Chemical smell
Arrival Temperature:	2.2°C	Suspended Solids:	Brown particles and plant debris

DILUTION WATER CHARACTERIZATION		TEST CONDITIONS	
<b>MONTHLY AVERAGE</b>		Test Start Date & Time:	December 21, 2022 @ 4:30 PM
Source:	Municipal Dechlorinated	Test End Date & Time:	December 25, 2022 @ 4:30 PM
Temperature:	15.1 ± 0.5 °C	Protocol:	EPS 1/RM/13*
Dissolved Oxygen:	9.3 ± 0.3 mg/L	Type of Test:	96-hour static LC <sub>50</sub>
Conductivity:	140 ± 11 µS/cm	Volume of Test Solutions:	20 Liters
Hardness:	25 ± 0 mg/L	Photoperiod:	16h ± 1h Light/08h ± 1h Dark
pH:	7.2 ± 0.3 pH units	Light Intensity:	360 Lux
Monthly Data:	November 2022	Aeration Rate:	6.5 ± 1.0 mL/min.L <sup>-1</sup>
Date Revised:	November 30, 2022	Preaeration Time:	30 minutes
		Test Temperature:	15.0 ± 1.0 °C
		Performed by:	L. Joy/T. Bradbury/A. Woodrow/ D. Nash

TEST ORGANISM		REFERENCE TOXICITY TEST DATA (LOG SCALE)	
Species:	<i>Oncorhynchus mykiss</i> (Rainbow Trout)	Test Organism:	<i>Oncorhynchus mykiss</i>
Source:	Lyndon Fish Hatcheries	Toxicant:	Phenol
Batch Number:	22-11	Fish Batch No.:	22-11
Number per Tank:	10	Reference Toxicant Date:	November 25 - 29, 2022
% Mortality:	0.00 % (7 Days Prior to Testing)	LC <sub>50</sub> Value:	1.00 mg/L
Mean Fork Length (cm):	4.7 ± 0.3      Range: 3.9 – 5.0	95% Confidence Limits:	0.88 – 1.12 mg/L
Mean Total Weight (g):	1.0 ± 0.1      Range: 0.8 – 1.2	Historic Mean ± 2 SD:	0.92 ± 0.16 mg/L
Loading Density (g/L):	0.5	(Warning Limits)	

**BIOASSAY CERTIFICATE OF ANALYSIS**  
**Rainbow Trout LC<sub>50</sub>**

**Customer:** Costas Farassoglou  
ALS Canada Ltd.  
2103 Dollarton Hwy  
North Vancouver, BC, V7H 0A7  
613-225-8279 Ext. 377



**Report Date:** 05-Jan-23  
**Project Number:** 11468  
**Sample ID:** B22-1555  
**Report ID:** 10258

TEST DATA									
Effluent Conc. (%)	Temp (°C)		D.O. (mg/L (%))		pH Units		Cond. (µs/cm)		Mortality (%)
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	
100	15.1	14.6	9.1 (94)	9.4 (98)	7.4	8.1	799	613	0
50	15.4	14.9	9.8 (98)	9.5 (99)	7.5	8.2	462	457	0
25	14.4	14.6	9.7 (98)	9.6 (98)	7.5	8.1	336	323	0
12.5	14.0	14.6	9.9 (100)	9.7 (101)	7.5	8.1	202	208	0
6.25	14.0	14.6	9.7 (98)	9.7 (98)	7.5	7.9	184	187	0
0	14.2	14.5	9.8 (100)	9.6 (97)	7.6	7.6	134	145	0

TEST OBSERVATION		
Effluent Conc. (%)	100	All fish swimming with normal behavior
	50	
	25	
	12.5	
	6.25	
	0	

TEST RESULT	
LC <sub>50</sub> value (static, acute) **: > 100 %	95% Confidence Intervals: 100.00 % - Infinity

COMMENTS
<ul style="list-style-type: none"> <li>- Sample has not been pH adjusted or filtered.</li> <li>- *The above analysis was conducted according to protocols indicated. Reference Method: For Determining Acute Lethality of Effluents to Rainbow Trout (Report EPS 1/RM/13 Second Edition, December 2000, May 2007, and February 2016 amendments), with the modification of initiating the Reference Toxicant prior to the completion of two-week acclimation period.</li> <li>- The above results, which refer to the sample(s) tested as they were received only, are for your information and will be held in the strictest confidence by this firm.</li> <li>- The report shall not be reproduced except in full without approval of the laboratory, as the laboratory cannot provide assurance that parts of the report are not taken out of context.</li> <li>- Sample controls are considered a part of a sample test and as such are subject to the same treatment (this includes, but is not limited to, aeration and temperature testing requirements).</li> <li>- **The CETIS™ Program was used to calculate the LC<sub>50</sub> value using binomial analysis.</li> </ul>

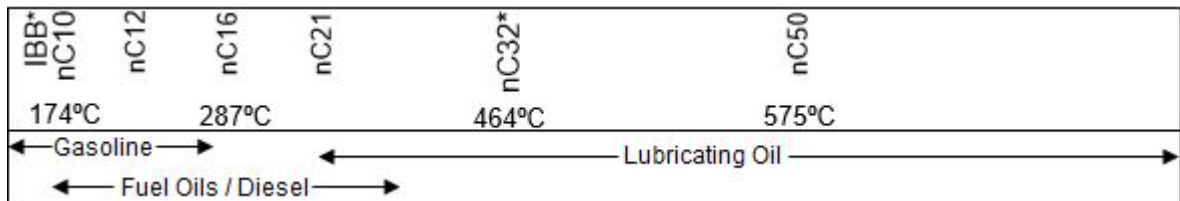
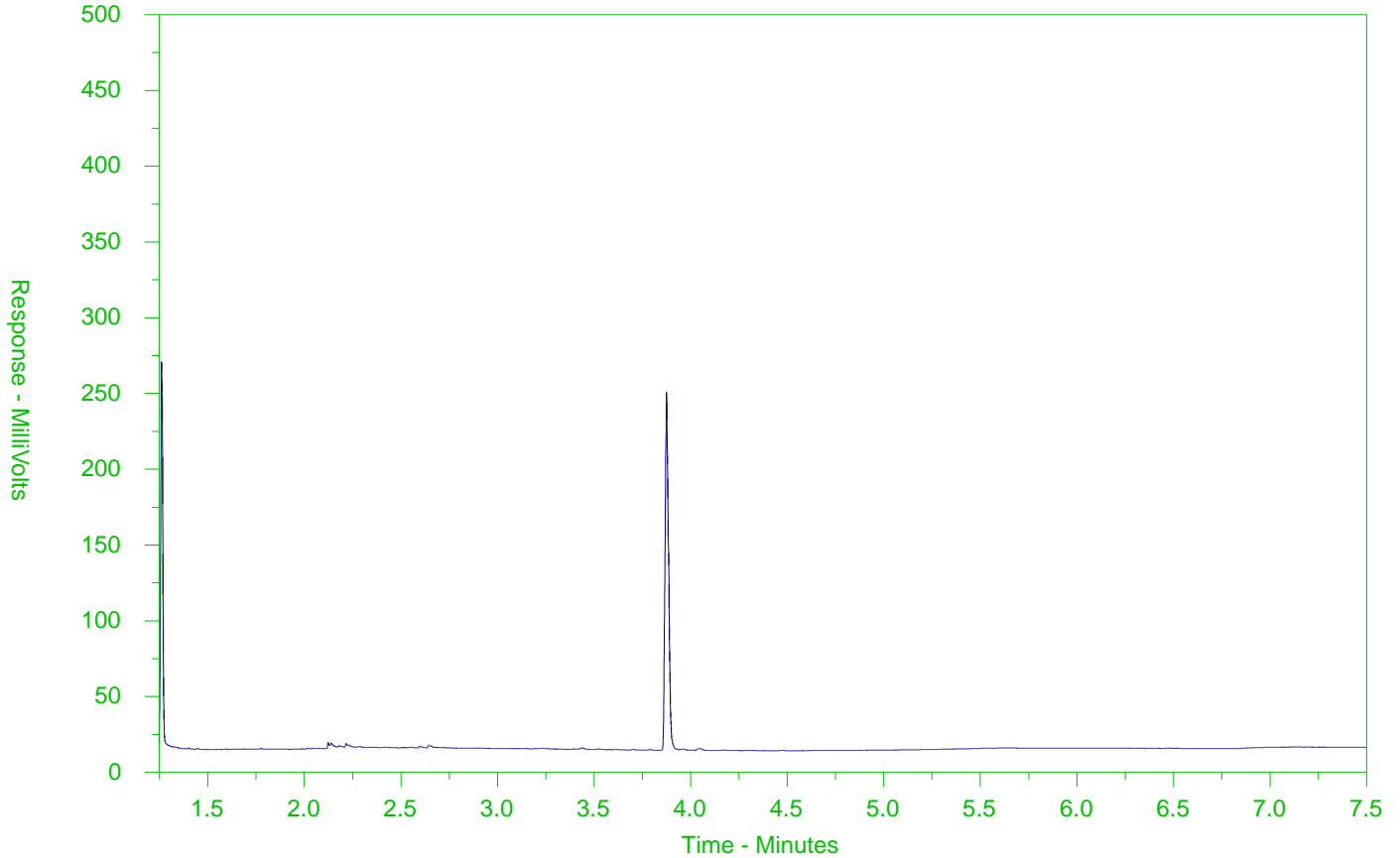
VERIFICATION	
<i>This report and all data included within was reviewed and validated by the following individuals</i>	
Technical Reviewer: 	Senior Reviewer: 

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2200073-001-E601F  
Client Sample ID: PLCS



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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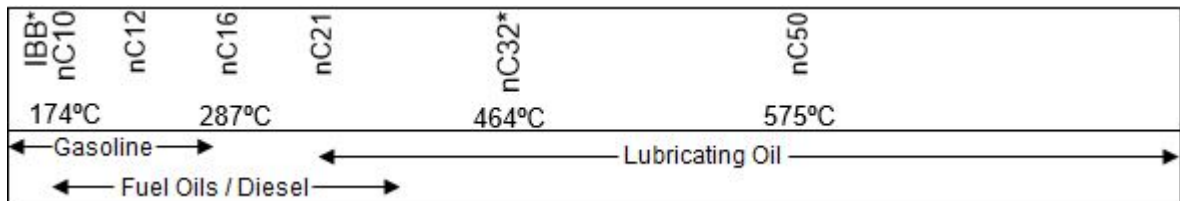
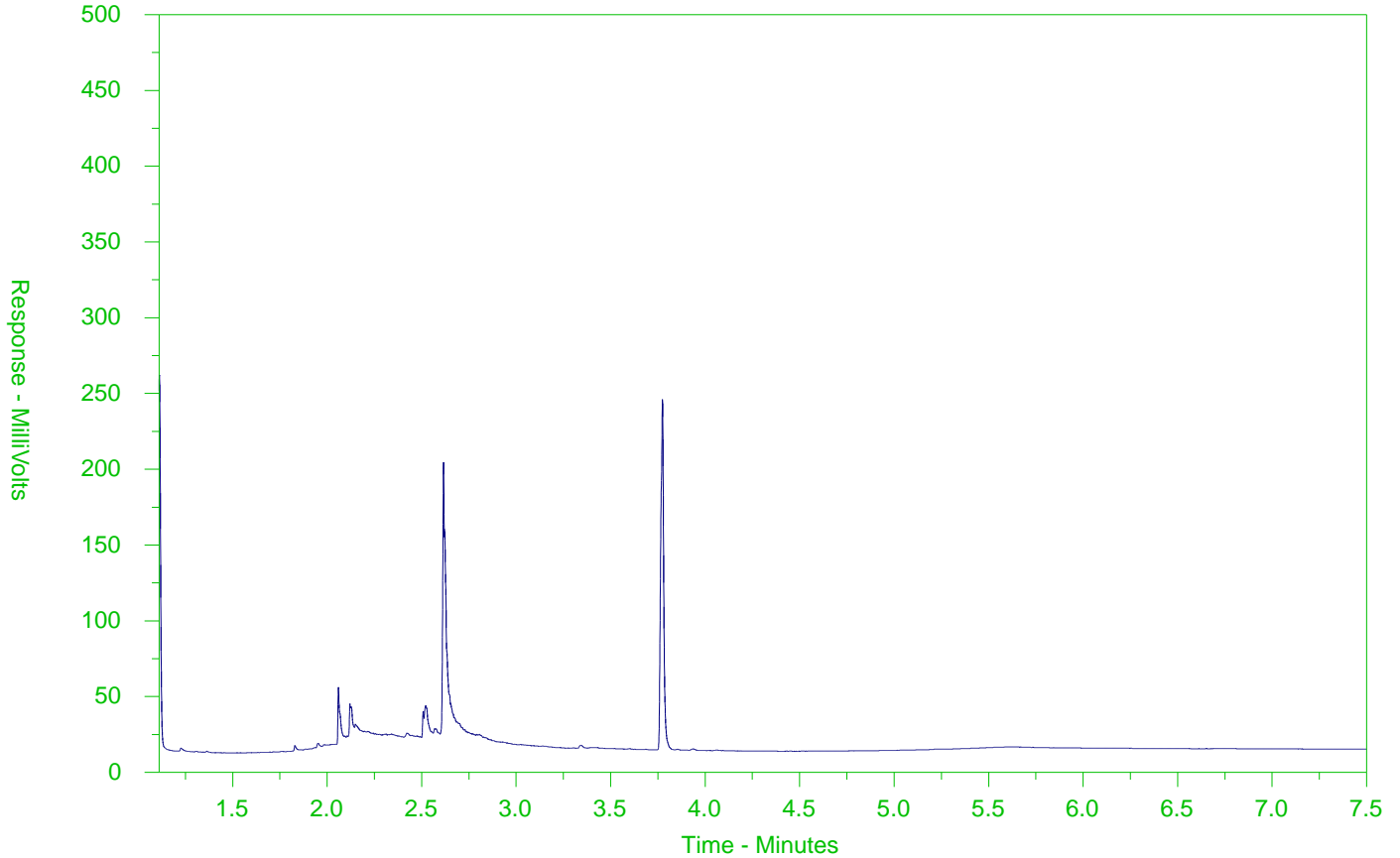
extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2200073-002-E601F  
Client Sample ID: SLCS



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.





www.alsglobal.com

# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17

Page

Environmental Division  
Halifax  
Work Order Reference  
HA2200073



Telephone: +1 902 483 8298

Report To: Englobe Corp.		Contact and company name below will appear on the final report		Report Format / Distribution		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EOD (OPTIONAL)		Select Service Level Below - Contact your AM to con	
Company: Mike Smith		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Compare Results to Criteria on Report - provide details below if box checked		Regular [R1] <input checked="" type="checkbox"/> Standard [RT] if received by 3 pm - Tu		4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/>	
Phone: 709-743-6096		Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		EMERGENCY		1 Business day Same Day, Week Laboratory open	
Street: 39 Sagona Ave		City/Province: Mount Pearl, NL		Email 1 or Fax: Michael.Smith2@englobecorp.com		Date and Time Required for all E&P YATS:			
Postal Code: A1N 4P9		Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		For tests that can not be performed according to the service level selected:			
Company: [blank]		Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		Analysis Request:			
Contact: [blank]		Project Information		Email 1 or Fax: cb.facturas@englobecorp.com		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below			
ALS Account # / Quote #: HA2022ENGL1000001		AF/ECost Center: [blank]		Email 2: Michael.Smith2@englobecorp.com		Leachate Collection System			
Job #: 2210292000		Major/Minor Code: [blank]		Oil and Gas Required Fields (client use): [blank]		General Chemistry with Metals (Total)			
PO / AFE: [blank]		Requisitioner: [blank]		Routing Code: [blank]		Total Mercury in Water			
LSD: Come By Chance Haz Waste Landfill		Location: [blank]		ALS Contact: Emily Smith		Dissolved Metals in Water (ICPMS)			
ALS Lab Work Order # (lab use only): HA2200073 5D		Date: 21/12/22		Time: (hh:mm)		Dissolved Mercury in Water			
ALS Sample # (lab use only): PLS		Date: 21/12/22		Time: (hh:mm)		BTEX/TPH (RBCA Tier I) in Water			
Sample Identification and/or Coordinates (This description will appear on the report): SCS		Date: 21/12/22		Time: (hh:mm)		VOCs in Water - Full List			
						PAHs in Water			
						PCBs in Water			
						4AAP Phenols in Water			
						Cyanide (Total)			
						Sulphide in Water (Waterioo)			
						LC50 - Rainbow Trout (Avalon)			
						SAMPLES ON HOLD			
						SUSPECTED HAZARD (see Special Instructions)			
Drinking Water (DW) Samples (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		Sample Type		Frozen <input type="checkbox"/>		SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Note: LC50 sample will be sent directly to Avalon by client		Water		Ice Packs <input checked="" type="checkbox"/>		Ice Cubes <input type="checkbox"/>	
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Water		Cooling Inhibited <input type="checkbox"/>		Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>	
SHIPPING RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		Water		INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
Released by: [Signature]		Date: Dec 21/22		Time: [blank]		Received by: [Signature]		Date: 12/22/22	
Time: [blank]		Time: [blank]		Time: [blank]		Time: [blank]		Time: 9:00	

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Only water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WW-219, 20-490, SC-176, N-496, MM-533, GC-268

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 EDITION



## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<p><b>Work Order</b> : <b>HA2300003</b></p> <p><b>Amendment</b> : <b>1</b></p> <p><b>Client</b> : <b>Englobe Corp.</b></p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : Lisa Clancey</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 4</p> <p><b>No. of samples analysed</b> : 4</p>	<p><b>Page</b> : 1 of 26</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 05-Jan-2023 10:40</p> <p><b>Date Analysis Commenced</b> : 05-Jan-2023</p> <p><b>Issue Date</b> : 18-Jan-2023 11:20</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Organics, Waterloo, Ontario

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
none	none
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLHC	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
SUR-ND	<i>Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.</i>



## Analytical Results

				Client sample ID							
				MW93-1							
Sub-Matrix: Water (Matrix: Water)				Sampling date/time							
Analyte	Method	LOR	Unit	HA2300003-001	ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
Alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	247	--	--	--	--	--	--	--
Alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290	1.0	mg/L	202	--	--	--	--	--	--	--
Colour, apparent	E330	2.0	CU	17.7	--	--	--	--	--	--	--
Conductivity	E100	1.0	µS/cm	488	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	0.484	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	0.237	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	7.74	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	7.98	--	--	--	--	--	--	--
pH	E108	0.10	pH units	8.22	--	--	--	--	--	--	--
Solids, total dissolved [TDS]	E162	10	mg/L	290	DLDS	--	--	--	--	--	--
Turbidity	E121	0.10	NTU	5.14	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
Ammonia, total (as N)	E298	0.0050	mg/L	0.0098	--	--	--	--	--	--	--
Chloride	E235.Cl	0.50	mg/L	12.4	--	2300 mg/L	--	--	--	--	--
Fluoride	E235.F	0.020	mg/L	0.228	--	--	--	--	--	--	--
Nitrate (as N)	E235.NO3	0.020	mg/L	<0.020	--	--	--	--	--	--	--
Nitrate + Nitrite (as N)	EC235.N+N	0.0032	mg/L	<0.0224	--	--	--	--	--	--	--
Nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
Phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	0.0228	--	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	37.0	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
Carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	<0.50	--	--	--	--	--	--	--
<b>Ion Balance</b>											
Anion sum	EC101	0.10	meq/L	5.17	--	--	--	--	--	--	--
Cation sum	EC101	0.10	meq/L	5.17	--	--	--	--	--	--	--
Ion balance (cations/anions)	EC101	0.010	%	100	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
Aluminum, dissolved	E421	0.0010	mg/L	0.0041	--	--	--	--	--	--
Antimony, dissolved	E421	0.00010	mg/L	<0.00010	--	20 mg/L	--	--	--	--
Arsenic, dissolved	E421	0.00010	mg/L	0.00091	--	1.9 mg/L	--	--	--	--
Barium, dissolved	E421	0.00010	mg/L	0.0554	--	29 mg/L	--	--	--	--
Beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	0.067 mg/L	--	--	--	--
Bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Boron, dissolved	E421	0.010	mg/L	0.083	--	45 mg/L	--	--	--	--
Cadmium, dissolved	E421	0.0000050	mg/L	<0.0000050	--	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421	0.050	mg/L	24.2	--	--	--	--	--	--
Cesium, dissolved	E421	0.000010	mg/L	0.000063	--	--	--	--	--	--
Chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
Cobalt, dissolved	E421	0.00010	mg/L	<0.00010	--	0.066 mg/L	--	--	--	--
Copper, dissolved	E421	0.00020	mg/L	0.00111	--	0.087 mg/L	--	--	--	--
Iron, dissolved	E421	0.010	mg/L	<0.010	--	--	--	--	--	--
Lead, dissolved	E421	0.000050	mg/L	<0.000050	--	0.025 mg/L	--	--	--	--
Lithium, dissolved	E421	0.0010	mg/L	0.0082	--	--	--	--	--	--
Magnesium, dissolved	E421	0.0050	mg/L	12.3	--	--	--	--	--	--
Manganese, dissolved	E421	0.00010	mg/L	0.00282	--	--	--	--	--	--
Molybdenum, dissolved	E421	0.000050	mg/L	0.0183	--	9.2 mg/L	--	--	--	--
Nickel, dissolved	E421	0.00050	mg/L	<0.00050	--	0.49 mg/L	--	--	--	--
Phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
Potassium, dissolved	E421	0.050	mg/L	1.60	--	--	--	--	--	--
Rubidium, dissolved	E421	0.00020	mg/L	0.00085	--	--	--	--	--	--
Selenium, dissolved	E421	0.000050	mg/L	<0.000050	--	0.063 mg/L	--	--	--	--
Silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	7.76	--	--	--	--	--	--
Silicon, dissolved	E421	0.050	mg/L	3.63	--	--	--	--	--	--
Silver, dissolved	E421	0.000010	mg/L	<0.000010	--	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421	0.050	mg/L	66.9	--	2300 mg/L	--	--	--	--
Strontium, dissolved	E421	0.00020	mg/L	0.200	--	--	--	--	--	--
Sulfur, dissolved	E421	0.50	mg/L	13.4	--	--	--	--	--	--
Tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
Thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Tin, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
Tungsten, dissolved	E421	0.00010	mg/L	0.0137	--	--	--	--	--	--
Uranium, dissolved	E421	0.000010	mg/L	0.000430	--	0.42 mg/L	--	--	--	--
Vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
Zinc, dissolved	E421	0.0010	mg/L	0.0020	--	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	130000 µg/L	--	--	--	--
Bromodichloromethane	E611D	0.50	µg/L	<0.50	--	85000 µg/L	--	--	--	--
Bromoform	E611D	0.50	µg/L	<0.50	--	380 µg/L	--	--	--	--
Bromomethane	E611D	0.50	µg/L	<0.50	--	5.6 µg/L	--	--	--	--
Carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
Carbon tetrachloride	E611D	0.20	µg/L	<0.20	--	0.79 µg/L	--	--	--	--
Chlorobenzene	E611D	0.50	µg/L	<0.50	--	630 µg/L	--	--	--	--
Chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
Chloroform	E611D	0.50	µg/L	<0.50	--	2.4 µg/L	--	--	--	--
Chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
Dibromochloromethane	E611D	0.50	µg/L	<0.50	--	82000 µg/L	--	--	--	--
Dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	0.25 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	--	4600 µg/L	--	--	--	--
Dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	--	9600 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	--	8 µg/L	--	--	--	--
Dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	4400 µg/L	--	--	--	--
Dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	320 µg/L	--	--	--	--
Dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	--	610 µg/L	--	--	--	--
Dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	16 µg/L	--	--	--	--
Dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	5.2 µg/L	--	--	--	--
Dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>										
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
Hexane, n-	E611D	0.50	µg/L	<0.50	--	51 µg/L	--	--	--	--
Hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	470000 µg/L	--	--	--	--
Methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	140000 µg/L	--	--	--	--
Methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	--	190 µg/L	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	--	1300 µg/L	--	--	--	--
Tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	3.3 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	3.2 µg/L	--	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	20000 µg/L	18000 µg/L	--	--	--	--
Trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	640 µg/L	--	--	--	--
Trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	4.7 µg/L	--	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	2500 µg/L	--	--	--	--
Vinyl chloride	E611D	0.50	µg/L	<0.50	--	0.5 µg/L	--	--	--	--
Trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Benzene	E611A	0.00050	mg/L	<0.00050	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Toluene	E611A	0.00050	mg/L	<0.00050	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Ethylbenzene	E611A	0.00050	mg/L	<0.00050	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Xylenes, total	E611A	0.00050	mg/L	<0.00050	20 mg/L	4.2 mg/L	--	--	--	--
Xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	71.9	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	55.1	SUR-ND	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	95.8	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611D	1.0	%	95.9	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611D	1.0	%	98.5	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-001 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
Acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
Acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
Benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
Benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
Benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
Chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
Dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
Fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
Fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
Perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
Pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
Quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Chrysene-d12	E641A-L	0.1	%	103	--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2300003-001 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
Naphthalene-d8	E641A-L	0.1	%	91.6	--	--	--	--	--	--
Phenanthrene-d10	E641A-L	0.1	%	110	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
Decachlorobiphenyl	E687	0.1	%	105	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	88.3	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |



## Analytical Results

				Client sample ID							
				MW93-1A							
Sub-Matrix: Water (Matrix: Water)				Sampling date/time							
Analyte	Method	LOR	Unit	HA2300003-002	ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
Alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	363	--	--	--	--	--	--	--
Alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290	1.0	mg/L	298	--	--	--	--	--	--	--
Colour, apparent	E330	2.0	CU	111	--	--	--	--	--	--	--
Conductivity	E100	1.0	µS/cm	668	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	0.691	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	0.444	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	7.36	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	7.60	--	--	--	--	--	--	--
pH	E108	0.10	pH units	8.05	--	--	--	--	--	--	--
Solids, total dissolved [TDS]	E162	10	mg/L	392	DLDS	--	--	--	--	--	--
Turbidity	E121	0.10	NTU	45.4	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
Ammonia, total (as N)	E298	0.0050	mg/L	0.0107	--	--	--	--	--	--	--
Chloride	E235.Cl	0.50	mg/L	9.79	--	2300 mg/L	--	--	--	--	--
Fluoride	E235.F	0.020	mg/L	0.107	--	--	--	--	--	--	--
Nitrate (as N)	E235.NO3	0.020	mg/L	<0.020	--	--	--	--	--	--	--
Nitrate + Nitrite (as N)	EC235.N+N	0.0032	mg/L	<0.0224	--	--	--	--	--	--	--
Nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
Phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010	--	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	45.7	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
Carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	1.01	--	--	--	--	--	--	--
<b>Ion Balance</b>											
Anion sum	EC101	0.10	meq/L	7.19	--	--	--	--	--	--	--
Cation sum	EC101	0.10	meq/L	7.28	--	--	--	--	--	--	--
Ion balance (cations/anions)	EC101	0.010	%	101	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
Aluminum, dissolved	E421	0.0010	mg/L	0.0019	--	--	--	--	--	--
Antimony, dissolved	E421	0.00010	mg/L	<0.00010	--	20 mg/L	--	--	--	--
Arsenic, dissolved	E421	0.00010	mg/L	<0.00010	--	1.9 mg/L	--	--	--	--
Barium, dissolved	E421	0.00010	mg/L	0.0818	--	29 mg/L	--	--	--	--
Beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	0.067 mg/L	--	--	--	--
Bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Boron, dissolved	E421	0.010	mg/L	0.065	--	45 mg/L	--	--	--	--
Cadmium, dissolved	E421	0.0000050	mg/L	<0.0000050	--	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421	0.050	mg/L	41.4	--	--	--	--	--	--
Cesium, dissolved	E421	0.000010	mg/L	0.000015	--	--	--	--	--	--
Chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
Cobalt, dissolved	E421	0.00010	mg/L	<0.00010	--	0.066 mg/L	--	--	--	--
Copper, dissolved	E421	0.00020	mg/L	0.00042	--	0.087 mg/L	--	--	--	--
Iron, dissolved	E421	0.010	mg/L	<0.010	--	--	--	--	--	--
Lead, dissolved	E421	0.000050	mg/L	<0.000050	--	0.025 mg/L	--	--	--	--
Lithium, dissolved	E421	0.0010	mg/L	0.0163	--	--	--	--	--	--
Magnesium, dissolved	E421	0.0050	mg/L	19.0	--	--	--	--	--	--
Manganese, dissolved	E421	0.00010	mg/L	0.00157	--	--	--	--	--	--
Molybdenum, dissolved	E421	0.000050	mg/L	0.0129	--	9.2 mg/L	--	--	--	--
Nickel, dissolved	E421	0.00050	mg/L	0.00060	--	0.49 mg/L	--	--	--	--
Phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
Potassium, dissolved	E421	0.050	mg/L	2.42	--	--	--	--	--	--
Rubidium, dissolved	E421	0.00020	mg/L	0.00086	--	--	--	--	--	--
Selenium, dissolved	E421	0.000050	mg/L	<0.000050	--	0.063 mg/L	--	--	--	--
Silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	7.68	--	--	--	--	--	--
Silicon, dissolved	E421	0.050	mg/L	3.59	--	--	--	--	--	--
Silver, dissolved	E421	0.000010	mg/L	<0.000010	--	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421	0.050	mg/L	82.4	--	2300 mg/L	--	--	--	--
Strontium, dissolved	E421	0.00020	mg/L	0.302	--	--	--	--	--	--
Sulfur, dissolved	E421	0.50	mg/L	16.4	--	--	--	--	--	--
Tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
Thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Tin, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-002 (Continued)	ACRBCA CL/IL(C)NPOT[ Al]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
Tungsten, dissolved	E421	0.00010	mg/L	0.0101	--	--	--	--	--	--
Uranium, dissolved	E421	0.000010	mg/L	0.00298	--	0.42 mg/L	--	--	--	--
Vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
Zinc, dissolved	E421	0.0010	mg/L	0.0014	--	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	130000 µg/L	--	--	--	--
Bromodichloromethane	E611D	0.50	µg/L	<0.50	--	85000 µg/L	--	--	--	--
Bromoform	E611D	0.50	µg/L	<0.50	--	380 µg/L	--	--	--	--
Bromomethane	E611D	0.50	µg/L	<0.50	--	5.6 µg/L	--	--	--	--
Carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
Carbon tetrachloride	E611D	0.20	µg/L	<0.20	--	0.79 µg/L	--	--	--	--
Chlorobenzene	E611D	0.50	µg/L	<0.50	--	630 µg/L	--	--	--	--
Chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
Chloroform	E611D	0.50	µg/L	<0.50	--	2.4 µg/L	--	--	--	--
Chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
Dibromochloromethane	E611D	0.50	µg/L	<0.50	--	82000 µg/L	--	--	--	--
Dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	0.25 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	--	4600 µg/L	--	--	--	--
Dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	--	9600 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	--	8 µg/L	--	--	--	--
Dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	4400 µg/L	--	--	--	--
Dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	320 µg/L	--	--	--	--
Dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	--	610 µg/L	--	--	--	--
Dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	16 µg/L	--	--	--	--
Dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	5.2 µg/L	--	--	--	--
Dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>										
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
Hexane, n-	E611D	0.50	µg/L	<0.50	--	51 µg/L	--	--	--	--
Hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	470000 µg/L	--	--	--	--
Methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	140000 µg/L	--	--	--	--
Methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	--	190 µg/L	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	--	1300 µg/L	--	--	--	--
Tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	3.3 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	3.2 µg/L	--	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	20000 µg/L	18000 µg/L	--	--	--	--
Trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	640 µg/L	--	--	--	--
Trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	4.7 µg/L	--	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	2500 µg/L	--	--	--	--
Vinyl chloride	E611D	0.50	µg/L	<0.50	--	0.5 µg/L	--	--	--	--
Trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Benzene	E611A	0.00050	mg/L	<0.00050	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Toluene	E611A	0.00050	mg/L	<0.00050	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Ethylbenzene	E611A	0.00050	mg/L	<0.00050	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Xylenes, total	E611A	0.00050	mg/L	<0.00050	20 mg/L	4.2 mg/L	--	--	--	--
Xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	63.9	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	52.3	SUR-ND	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	90.8	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611A	1.0	%	94.7	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611A	1.0	%	98.0	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-002 (Continued)	ACRBCA CL/IL(C)NPOT[ AII]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
Acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
Acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
Benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
Benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
Benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
Chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
Dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
Fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
Fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
Perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
Pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
Quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Chrysene-d12	E641A-L	0.1	%	96.4	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-002 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
Naphthalene-d8	E641A-L	0.1	%	86.0	--	--	--	--	--	--
Phenanthrene-d10	E641A-L	0.1	%	104	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
Decachlorobiphenyl	E687	0.1	%	102	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	97.6	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |



## Analytical Results

				Client sample ID							
				MW93-2							
Sub-Matrix: Water (Matrix: Water)				Sampling date/time							
Analyte	Method	LOR	Unit	HA2300003-003	ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
Alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	2.3	--	--	--	--	--	--	--
Alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290	1.0	mg/L	1.9	--	--	--	--	--	--	--
Colour, apparent	E330	2.0	CU	1960	DLM	--	--	--	--	--	--
Conductivity	E100	1.0	µS/cm	242	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	-4.84	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	-5.10	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	9.98	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	10.2	--	--	--	--	--	--	--
pH	E108	0.10	pH units	5.13	--	--	--	--	--	--	--
Solids, total dissolved [TDS]	E162	10	mg/L	188	DLDS	--	--	--	--	--	--
Turbidity	E121	0.10	NTU	175	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
Ammonia, total (as N)	E298	0.0050	mg/L	0.139	--	--	--	--	--	--	--
Chloride	E235.Cl	0.50	mg/L	26.9	--	2300 mg/L	--	--	--	--	--
Fluoride	E235.F	0.020	mg/L	0.072	--	--	--	--	--	--	--
Nitrate (as N)	E235.NO3	0.020	mg/L	0.293	--	--	--	--	--	--	--
Nitrate + Nitrite (as N)	EC235.N+N	0.0032	mg/L	0.293	--	--	--	--	--	--	--
Nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
Phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	<0.0010	--	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	57.5	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
Carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	6.96	--	--	--	--	--	--	--
<b>Ion Balance</b>											
Anion sum	EC101	0.10	meq/L	2.02	--	--	--	--	--	--	--
Cation sum	EC101	0.10	meq/L	2.07	--	--	--	--	--	--	--
Ion balance (cations/anions)	EC101	0.010	%	102	--	--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2300003-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
Aluminum, dissolved	E421	0.0010	mg/L	0.473	--	--	--	--	--	--
Antimony, dissolved	E421	0.00010	mg/L	<0.00010	--	20 mg/L	--	--	--	--
Arsenic, dissolved	E421	0.00010	mg/L	0.00019	--	1.9 mg/L	--	--	--	--
Barium, dissolved	E421	0.00010	mg/L	0.0972	--	29 mg/L	--	--	--	--
Beryllium, dissolved	E421	0.000020	mg/L	0.00125	--	0.067 mg/L	--	--	--	--
Bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Boron, dissolved	E421	0.010	mg/L	0.012	--	45 mg/L	--	--	--	--
Cadmium, dissolved	E421	0.0000050	mg/L	0.00599	--	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421	0.050	mg/L	11.1	--	--	--	--	--	--
Cesium, dissolved	E421	0.000010	mg/L	0.000025	--	--	--	--	--	--
Chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
Cobalt, dissolved	E421	0.00010	mg/L	0.00406	--	0.066 mg/L	--	--	--	--
Copper, dissolved	E421	0.00020	mg/L	0.00238	--	0.087 mg/L	--	--	--	--
Iron, dissolved	E421	0.010	mg/L	0.789	--	--	--	--	--	--
Lead, dissolved	E421	0.000050	mg/L	0.000988	--	0.025 mg/L	--	--	--	--
Lithium, dissolved	E421	0.0010	mg/L	0.0042	--	--	--	--	--	--
Magnesium, dissolved	E421	0.0050	mg/L	4.83	--	--	--	--	--	--
Manganese, dissolved	E421	0.00010	mg/L	5.81	DLHC	--	--	--	--	--
Molybdenum, dissolved	E421	0.000050	mg/L	0.000052	--	9.2 mg/L	--	--	--	--
Nickel, dissolved	E421	0.00050	mg/L	0.00608	--	0.49 mg/L	--	--	--	--
Phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
Potassium, dissolved	E421	0.050	mg/L	1.08	--	--	--	--	--	--
Rubidium, dissolved	E421	0.00020	mg/L	0.00202	--	--	--	--	--	--
Selenium, dissolved	E421	0.000050	mg/L	<0.000050	--	0.063 mg/L	--	--	--	--
Silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	6.95	--	--	--	--	--	--
Silicon, dissolved	E421	0.050	mg/L	3.25	--	--	--	--	--	--
Silver, dissolved	E421	0.000010	mg/L	<0.000010	--	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421	0.050	mg/L	17.1	--	2300 mg/L	--	--	--	--
Strontium, dissolved	E421	0.00020	mg/L	0.0683	--	--	--	--	--	--
Sulfur, dissolved	E421	0.50	mg/L	19.5	--	--	--	--	--	--
Tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
Thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Tin, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Titanium, dissolved	E421	0.00030	mg/L	0.00037	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
Tungsten, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Uranium, dissolved	E421	0.000010	mg/L	0.000021	--	0.42 mg/L	--	--	--	--
Vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
Zinc, dissolved	E421	0.0010	mg/L	1.18	--	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	130000 µg/L	--	--	--	--
Bromodichloromethane	E611D	0.50	µg/L	<0.50	--	85000 µg/L	--	--	--	--
Bromoform	E611D	0.50	µg/L	<0.50	--	380 µg/L	--	--	--	--
Bromomethane	E611D	0.50	µg/L	<0.50	--	5.6 µg/L	--	--	--	--
Carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
Carbon tetrachloride	E611D	0.20	µg/L	<0.20	--	0.79 µg/L	--	--	--	--
Chlorobenzene	E611D	0.50	µg/L	<0.50	--	630 µg/L	--	--	--	--
Chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
Chloroform	E611D	0.50	µg/L	<0.50	--	2.4 µg/L	--	--	--	--
Chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
Dibromochloromethane	E611D	0.50	µg/L	<0.50	--	82000 µg/L	--	--	--	--
Dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	0.25 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	--	4600 µg/L	--	--	--	--
Dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	--	9600 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	--	8 µg/L	--	--	--	--
Dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	4400 µg/L	--	--	--	--
Dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	320 µg/L	--	--	--	--
Dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	--	610 µg/L	--	--	--	--
Dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	16 µg/L	--	--	--	--
Dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	5.2 µg/L	--	--	--	--
Dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>										
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
Hexane, n-	E611D	0.50	µg/L	<0.50	--	51 µg/L	--	--	--	--
Hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	470000 µg/L	--	--	--	--
Methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	140000 µg/L	--	--	--	--
Methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	--	190 µg/L	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	--	1300 µg/L	--	--	--	--
Tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	3.3 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	3.2 µg/L	--	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	20000 µg/L	18000 µg/L	--	--	--	--
Trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	640 µg/L	--	--	--	--
Trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	4.7 µg/L	--	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	2500 µg/L	--	--	--	--
Vinyl chloride	E611D	0.50	µg/L	<0.50	--	0.5 µg/L	--	--	--	--
Trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Benzene	E611A	0.00050	mg/L	<0.00050	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Toluene	E611A	0.00050	mg/L	<0.00050	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Ethylbenzene	E611A	0.00050	mg/L	<0.00050	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Xylenes, total	E611A	0.00050	mg/L	<0.00050	20 mg/L	4.2 mg/L	--	--	--	--
Xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	90.6	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	74.6	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	71.6	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611A	1.0	%	97.4	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611A	1.0	%	99.2	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-003 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
Acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
Acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
Benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
Benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
Benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
Chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
Dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
Fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
Fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
Perylene	E641A-L	0.010	µg/L	0.048	--	--	--	--	--	--
Phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
Pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
Quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Chrysene-d12	E641A-L	0.1	%	103	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-003 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-All				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
Naphthalene-d8	E641A-L	0.1	%	91.9	--	--	--	--	--	--
Phenanthrene-d10	E641A-L	0.1	%	109	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
Decachlorobiphenyl	E687	0.1	%	97.6	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	102	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
MW93-2	Water	Cadmium, dissolved		ON153/04	T3-NPGW-C-All	0.00599 mg/L	0.0027 mg/L
	Water	Zinc, dissolved		ON153/04	T3-NPGW-C-All	1.18 mg/L	1.1 mg/L

### Sample Comments

Sample	Client Id	Comment
HA2300003-003	MW93-2	N/A: Not Applicable (mTPH < LOR)

#### Key:

ACRBCA	Atlantic Canada RBCA EQS Groundwater
CL/IL(C)NPOT[All]T1SL	RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening
ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T3-NPGW-C-All	153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)



## Analytical Results

				Client sample ID							
				MW93-2A							
Sub-Matrix: Water (Matrix: Water)				Sampling date/time							
Analyte	Method	LOR	Unit	HA2300003-004	ACRBCA CL/IL(C)NPOT[ AIIJT1SL	ON153/04 T3-NPGW-C-AI I					
<b>Physical Tests</b>											
Alkalinity, bicarbonate (as HCO3)	E290	1.0	mg/L	217	--	--	--	--	--	--	--
Alkalinity, carbonate (as CO3)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, hydroxide (as OH)	E290	1.0	mg/L	<1.0	--	--	--	--	--	--	--
Alkalinity, total (as CaCO3)	E290	1.0	mg/L	178	--	--	--	--	--	--	--
Colour, apparent	E330	2.0	CU	26.0	--	--	--	--	--	--	--
Conductivity	E100	1.0	µS/cm	473	--	--	--	--	--	--	--
Langelier index (@ 20°C)	EC105	0.010	-	0.597	--	--	--	--	--	--	--
Langelier index (@ 4°C)	EC105	0.010	-	0.350	--	--	--	--	--	--	--
pH, saturation (@ 20°C)	EC105	0.010	pH units	7.44	--	--	--	--	--	--	--
pH, saturation (@ 4°C)	EC105	0.010	pH units	7.69	--	--	--	--	--	--	--
pH	E108	0.10	pH units	8.04	--	--	--	--	--	--	--
Solids, total dissolved [TDS]	E162	10	mg/L	304	DLDS	--	--	--	--	--	--
Turbidity	E121	0.10	NTU	10.3	--	--	--	--	--	--	--
<b>Anions and Nutrients</b>											
Ammonia, total (as N)	E298	0.0050	mg/L	0.0071	--	--	--	--	--	--	--
Chloride	E235.Cl	0.50	mg/L	20.5	--	2300 mg/L	--	--	--	--	--
Fluoride	E235.F	0.020	mg/L	0.042	--	--	--	--	--	--	--
Nitrate (as N)	E235.NO3	0.020	mg/L	0.025	--	--	--	--	--	--	--
Nitrate + Nitrite (as N)	EC235.N+N	0.0032	mg/L	0.0250	--	--	--	--	--	--	--
Nitrite (as N)	E235.NO2	0.010	mg/L	<0.010	--	--	--	--	--	--	--
Phosphate, ortho-, dissolved (as P)	E378-U	0.0010	mg/L	0.0013	--	--	--	--	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	36.7	--	--	--	--	--	--	--
<b>Organic / Inorganic Carbon</b>											
Carbon, dissolved organic [DOC]	E358-L	0.50	mg/L	1.28	--	--	--	--	--	--	--
<b>Ion Balance</b>											
Anion sum	EC101	0.10	meq/L	4.90	--	--	--	--	--	--	--
Cation sum	EC101	0.10	meq/L	4.67	--	--	--	--	--	--	--
Ion balance (cations/anions)	EC101	0.010	%	95.3	--	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-004 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals</b>										
Aluminum, dissolved	E421	0.0010	mg/L	0.0119	--	--	--	--	--	--
Antimony, dissolved	E421	0.00010	mg/L	0.00027	--	20 mg/L	--	--	--	--
Arsenic, dissolved	E421	0.00010	mg/L	0.00231	--	1.9 mg/L	--	--	--	--
Barium, dissolved	E421	0.00010	mg/L	0.147	--	29 mg/L	--	--	--	--
Beryllium, dissolved	E421	0.000020	mg/L	<0.000020	--	0.067 mg/L	--	--	--	--
Bismuth, dissolved	E421	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Boron, dissolved	E421	0.010	mg/L	0.535	--	45 mg/L	--	--	--	--
Cadmium, dissolved	E421	0.0000050	mg/L	0.0000150	--	0.0027 mg/L	--	--	--	--
Calcium, dissolved	E421	0.050	mg/L	54.2	--	--	--	--	--	--
Cesium, dissolved	E421	0.000010	mg/L	0.000076	--	--	--	--	--	--
Chromium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.81 mg/L	--	--	--	--
Cobalt, dissolved	E421	0.00010	mg/L	<0.00010	--	0.066 mg/L	--	--	--	--
Copper, dissolved	E421	0.00020	mg/L	0.00070	--	0.087 mg/L	--	--	--	--
Iron, dissolved	E421	0.010	mg/L	0.030	--	--	--	--	--	--
Lead, dissolved	E421	0.000050	mg/L	<0.000050	--	0.025 mg/L	--	--	--	--
Lithium, dissolved	E421	0.0010	mg/L	0.0075	--	--	--	--	--	--
Magnesium, dissolved	E421	0.0050	mg/L	12.4	--	--	--	--	--	--
Manganese, dissolved	E421	0.00010	mg/L	0.0468	--	--	--	--	--	--
Molybdenum, dissolved	E421	0.000050	mg/L	0.000251	--	9.2 mg/L	--	--	--	--
Nickel, dissolved	E421	0.00050	mg/L	<0.00050	--	0.49 mg/L	--	--	--	--
Phosphorus, dissolved	E421	0.050	mg/L	<0.050	--	--	--	--	--	--
Potassium, dissolved	E421	0.050	mg/L	1.21	--	--	--	--	--	--
Rubidium, dissolved	E421	0.00020	mg/L	0.00084	--	--	--	--	--	--
Selenium, dissolved	E421	0.000050	mg/L	<0.000050	--	0.063 mg/L	--	--	--	--
Silicon (as SiO2), dissolved	EC421.SiO2	0.15	mg/L	17.4	--	--	--	--	--	--
Silicon, dissolved	E421	0.050	mg/L	8.12	--	--	--	--	--	--
Silver, dissolved	E421	0.000010	mg/L	<0.000010	--	0.0015 mg/L	--	--	--	--
Sodium, dissolved	E421	0.050	mg/L	21.0	--	2300 mg/L	--	--	--	--
Strontium, dissolved	E421	0.00020	mg/L	0.203	--	--	--	--	--	--
Sulfur, dissolved	E421	0.50	mg/L	13.8	--	--	--	--	--	--
Tellurium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Thallium, dissolved	E421	0.000010	mg/L	<0.000010	--	0.51 mg/L	--	--	--	--
Thorium, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Tin, dissolved	E421	0.00010	mg/L	0.00050	--	--	--	--	--	--
Titanium, dissolved	E421	0.00030	mg/L	<0.00030	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-004 (Continued)	ACRBCA CL/IL(C)NPOT[ Al]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Dissolved Metals - Continued</b>										
Tungsten, dissolved	E421	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Uranium, dissolved	E421	0.000010	mg/L	0.000151	--	0.42 mg/L	--	--	--	--
Vanadium, dissolved	E421	0.00050	mg/L	<0.00050	--	0.25 mg/L	--	--	--	--
Zinc, dissolved	E421	0.0010	mg/L	0.0282	--	1.1 mg/L	--	--	--	--
Zirconium, dissolved	E421	0.00020	mg/L	<0.00020	--	--	--	--	--	--
Dissolved metals filtration location	EP421		-	Field	--	--	--	--	--	--
<b>Volatile Organic Compounds</b>										
Acetone	E611D	20	µg/L	<20	--	130000 µg/L	--	--	--	--
Bromodichloromethane	E611D	0.50	µg/L	<0.50	--	85000 µg/L	--	--	--	--
Bromoform	E611D	0.50	µg/L	<0.50	--	380 µg/L	--	--	--	--
Bromomethane	E611D	0.50	µg/L	<0.50	--	5.6 µg/L	--	--	--	--
Carbon disulfide	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
Carbon tetrachloride	E611D	0.20	µg/L	<0.20	--	0.79 µg/L	--	--	--	--
Chlorobenzene	E611D	0.50	µg/L	<0.50	--	630 µg/L	--	--	--	--
Chloroethane	E611D	0.50	µg/L	<0.50	--	--	--	--	--	--
Chloroform	E611D	0.50	µg/L	<0.50	--	2.4 µg/L	--	--	--	--
Chloromethane	E611D	2.0	µg/L	<2.0	--	--	--	--	--	--
Dibromochloromethane	E611D	0.50	µg/L	<0.50	--	82000 µg/L	--	--	--	--
Dibromoethane, 1,2-	E611D	0.20	µg/L	<0.20	--	0.25 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	--	4600 µg/L	--	--	--	--
Dichlorobenzene, 1,3-	E611D	0.50	µg/L	<0.50	--	9600 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	--	8 µg/L	--	--	--	--
Dichlorodifluoromethane	E611D	0.50	µg/L	<0.50	--	4400 µg/L	--	--	--	--
Dichloroethane, 1,1-	E611D	0.50	µg/L	<0.50	--	320 µg/L	--	--	--	--
Dichloroethane, 1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, 1,1-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, cis+trans-1,2-	E611D	0.71	µg/L	<0.71	--	--	--	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloroethylene, trans-1,2-	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	--	610 µg/L	--	--	--	--
Dichloropropane, 1,2-	E611D	0.50	µg/L	<0.50	--	16 µg/L	--	--	--	--
Dichloropropylene, cis+trans-1,3-	E611D	0.50	µg/L	<0.50	--	5.2 µg/L	--	--	--	--
Dichloropropylene, cis-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--





Analyte	Method	LOR	Unit	HA2300003-004 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Volatile Organic Compounds - Continued</b>										
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
Hexane, n-	E611D	0.50	µg/L	<0.50	--	51 µg/L	--	--	--	--
Hexanone, 2-	E611D	20	µg/L	<20	--	--	--	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	470000 µg/L	--	--	--	--
Methyl isobutyl ketone [MIBK]	E611D	20	µg/L	<20	--	140000 µg/L	--	--	--	--
Methyl-tert-butyl ether [MTBE]	E611D	0.50	µg/L	<0.50	--	190 µg/L	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	--	1300 µg/L	--	--	--	--
Tetrachloroethane, 1,1,1,2-	E611D	0.50	µg/L	<0.50	--	3.3 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	3.2 µg/L	--	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	20000 µg/L	18000 µg/L	--	--	--	--
Trichloroethane, 1,1,1-	E611D	0.50	µg/L	<0.50	--	640 µg/L	--	--	--	--
Trichloroethane, 1,1,2-	E611D	0.50	µg/L	<0.50	--	4.7 µg/L	--	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	--	1.6 µg/L	--	--	--	--
Trichlorofluoromethane	E611D	0.50	µg/L	<0.50	--	2500 µg/L	--	--	--	--
Vinyl chloride	E611D	0.50	µg/L	<0.50	--	0.5 µg/L	--	--	--	--
Trihalomethanes [THMs], total	E611D	1.0	µg/L	<1.0	--	--	--	--	--	--
<b>Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions</b>										
C6-C10 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Benzene	E611A	0.00050	mg/L	<0.00050	6.3 mg/L	0.044 mg/L	--	--	--	--
>C10-C16 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Toluene	E611A	0.00050	mg/L	<0.00050	20 mg/L	18 mg/L	--	--	--	--
>C16-C21 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Ethylbenzene	E611A	0.00050	mg/L	<0.00050	20 mg/L	2.3 mg/L	--	--	--	--
>C21-C32 fraction of mTPH	EC581D	1	%	<1	--	--	--	--	--	--
Xylenes, total	E611A	0.00050	mg/L	<0.00050	20 mg/L	4.2 mg/L	--	--	--	--
Xylene, o-	E611A	0.00030	mg/L	<0.00030	--	--	--	--	--	--
Xylene, m+p-	E611A	0.00040	mg/L	<0.00040	--	--	--	--	--	--
VPH C6-C10	E581.VPH	0.025	mg/L	<0.025	--	--	--	--	--	--
dotriacontane, n- (EPH)	E601F	1.0	%	78.5	--	--	--	--	--	--
isobutylbenzene (EPH)	E601F	1.0	%	65.5	--	--	--	--	--	--
isobutylbenzene (VPH)	E581.VPH	1.0	%	98.6	--	--	--	--	--	--
VPH C6-C10 (less BTEX)	EC580C	0.025	mg/L	<0.025	--	--	--	--	--	--
Bromofluorobenzene, 4-	E611D	1.0	%	95.9	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611D	1.0	%	98.2	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-004 (Continued)	ACRBCA CL/IL(C)NPOT[ AI]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Hydrocarbons - Continued</b>										
EPH >C10-C16	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C16-C21	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C21-C32	E601F	0.050	mg/L	<0.050	--	--	--	--	--	--
EPH >C34-C50	E601F	0.10	mg/L	<0.10	--	--	--	--	--	--
hydrocarbon resemblance	E601F		none	N/A	--	--	--	--	--	--
mTPH (Tier I)	EC581D	0.090	mg/L	<0.090	20 mg/L	--	--	--	--	--
return to baseline at C32	E601F		-	Yes	--	--	--	--	--	--
TEH >C10-C32	E601F	0.100	mg/L	<0.100	--	--	--	--	--	--
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	E641A-L	0.010	µg/L	<0.010	--	600 µg/L	--	--	--	--
Acenaphthylene	E641A-L	0.010	µg/L	<0.010	--	1.8 µg/L	--	--	--	--
Acridine	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Anthracene	E641A-L	0.010	µg/L	<0.010	--	2.4 µg/L	--	--	--	--
Benz(a)anthracene	E641A-L	0.010	µg/L	<0.010	--	4.7 µg/L	--	--	--	--
Benzo(a)pyrene	E641A-L	0.0050	µg/L	<0.0050	--	0.81 µg/L	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.75 µg/L	--	--	--	--
Benzo(b+j+k)fluoranthene	E641A-L	0.015	µg/L	<0.015	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Benzo(k)fluoranthene	E641A-L	0.010	µg/L	<0.010	--	0.4 µg/L	--	--	--	--
Chrysene	E641A-L	0.010	µg/L	<0.010	--	1 µg/L	--	--	--	--
Dibenz(a,h)anthracene	E641A-L	0.0050	µg/L	<0.0050	--	0.52 µg/L	--	--	--	--
Fluoranthene	E641A-L	0.010	µg/L	<0.010	--	130 µg/L	--	--	--	--
Fluorene	E641A-L	0.010	µg/L	<0.010	--	400 µg/L	--	--	--	--
indeno(1,2,3-c,d)pyrene	E641A-L	0.010	µg/L	<0.010	--	0.2 µg/L	--	--	--	--
Methylnaphthalene, 1+2-	E641A-L	0.015	µg/L	<0.015	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 1-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Methylnaphthalene, 2-	E641A-L	0.010	µg/L	<0.010	--	1800 µg/L	--	--	--	--
Naphthalene	E641A-L	0.010	µg/L	<0.010	--	1400 µg/L	--	--	--	--
Perylene	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Phenanthrene	E641A-L	0.010	µg/L	<0.010	--	580 µg/L	--	--	--	--
Pyrene	E641A-L	0.010	µg/L	<0.010	--	68 µg/L	--	--	--	--
Quinoline	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
B(a)P total potency equivalents [B(a)P TPE]	E641A-L	0.010	µg/L	<0.010	--	--	--	--	--	--
Chrysene-d12	E641A-L	0.1	%	96.0	--	--	--	--	--	--



Analyte	Method	LOR	Unit	HA2300003-004 (Continued)	ACRBCA CL/IL(C)NPOT[ All]T1SL	ON153/04 T3-NPGW-C-AI I				
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>										
Naphthalene-d8	E641A-L	0.1	%	83.8	--	--	--	--	--	--
Phenanthrene-d10	E641A-L	0.1	%	102	--	--	--	--	--	--
<b>Polychlorinated Biphenyls</b>										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	7.8 µg/L	--	--	--	--
Decachlorobiphenyl	E687	0.1	%	100	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	90.7	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

### No Breaches Found

**Key:**

- |                       |  |
|-----------------------|--|
| ACRBCA                | Atlantic Canada RBCA EQS Groundwater   |
| CL/IL(C)NPOT[All]T1SL | RBSL Commercial/Industrial (Coarse) Non-Potable [All Fuels] Tier 1 Screening |
| ON153/04              | Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)             |
| T3-NPGW-C-All         | 153 T3-Non-Potable Ground Water-All Types of Property Uses (Coarse)          |

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: HA2300003</b>	<b>Page</b>	: 1 of 20
<b>Amendment</b>	<b>: 1</b>		
<b>Client</b>	: Englobe Corp.	<b>Laboratory</b>	: Halifax - Environmental
<b>Contact</b>	: Mike Smith	<b>Account Manager</b>	: Emily Smith
<b>Address</b>	: Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9	<b>Address</b>	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
<b>Telephone</b>	:	<b>Telephone</b>	: +1 902 483 5298
<b>Project</b>	: 2210292.000	<b>Date Samples Received</b>	: 05-Jan-2023 10:40
<b>PO</b>	: ----	<b>Date Analysis Commenced</b>	: 05-Jan-2023
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 18-Jan-2023 11:20
<b>Sampler</b>	: Lisa Clancey 709-576-8148		
<b>Site</b>	: ----		
<b>Quote number</b>	: Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills		
<b>No. of samples received</b>	: 4		
<b>No. of samples analysed</b>	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo Organics, Waterloo, Ontario

Page : 2 of 20  
Work Order : HA2300003 Amendment 1  
Client : Englobe Corp.  
Project : 2210292.000



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 795318)</b>											
HA2300003-001	MW93-1	pH	----	E108	0.10	pH units	8.22	8.27	0.606%	4%	----
<b>Physical Tests (QC Lot: 795319)</b>											
HA2300003-001	MW93-1	Conductivity	----	E100	1.0	µS/cm	488	490	0.409%	10%	----
<b>Physical Tests (QC Lot: 795320)</b>											
HA2300003-001	MW93-1	Alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1.0	mg/L	202	198	2.36%	20%	----
<b>Physical Tests (QC Lot: 795431)</b>											
HA2300003-003	MW93-2	Turbidity	----	E121	0.10	NTU	175	182	3.92%	15%	----
<b>Physical Tests (QC Lot: 796380)</b>											
WT2300249-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	340	333	2.08%	20%	----
<b>Physical Tests (QC Lot: 797641)</b>											
HA2300003-001	MW93-1	Colour, apparent	----	E330	2.0	CU	17.7	18.2	0.4	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 795079)</b>											
HA2300003-001	MW93-1	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0098	0.0098	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 795313)</b>											
HA2300003-002	MW93-1A	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.107	0.102	0.005	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 795314)</b>											
HA2300003-002	MW93-1A	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 795315)</b>											
HA2300003-002	MW93-1A	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 795316)</b>											
HA2300003-002	MW93-1A	Chloride	16887-00-6	E235.Cl	0.50	mg/L	9.79	9.75	0.435%	20%	----
<b>Anions and Nutrients (QC Lot: 795317)</b>											
HA2300003-002	MW93-1A	Sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.30	mg/L	45.7	45.4	0.760%	20%	----
<b>Anions and Nutrients (QC Lot: 795812)</b>											
HA2300003-001	MW93-1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0228	0.0228	0.0878%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 797178)</b>											
TY2205202-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	15.1	16.0	6.25%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 801731)</b>											
HA2300003-001	MW93-1	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	0.60	0.10	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 795209)</b>											



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Dissolved Metals (QC Lot: 795209) - continued</b>											
HA2300003-001	MW93-1	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0041	0.0047	0.0006	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00091	0.00091	0.0000006	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0554	0.0579	4.53%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.083	0.086	0.004	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	24.2	24.8	2.60%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000063	0.000063	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00111	0.00109	0.00002	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0082	0.0079	0.0002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	12.3	12.2	0.354%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00282	0.00268	4.89%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0183	0.0192	4.37%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.60	1.58	1.25%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00085	0.00077	0.00008	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.63	3.62	0.384%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	66.9	64.1	4.29%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.200	0.213	6.13%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	13.4	13.4	0.0224%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Dissolved Metals (QC Lot: 795209) - continued</b>											
HA2300003-001	MW93-1	Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.0137	0.0136	0.140%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000430	0.000432	0.302%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	0.0018	0.0002	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 795357)</b>											
HA2300002-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.00020 mg/L	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611D	2.0	µg/L	<0.0020 mg/L	<2.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.00020 mg/L	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----





Sub-Matrix: **Water** **Laboratory Duplicate (DUP) Report**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 795357) - continued</b>											
HA2300002-001	Anonymous	Dichloromethane	75-09-2	E611D	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----		
Trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----		
Vinyl chloride	75-01-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----		
<b>Volatile Organic Compounds (QC Lot: 795359)</b>											
HA2300003-004	MW93-2A	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
<b>Hydrocarbons (QC Lot: 795358)</b>											
HA2300002-001	Anonymous	VPH C6-C10	n/a	E581.VPH	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 795319)</b>						
Conductivity	---	E100	1	µS/cm	<1.0	---
<b>Physical Tests (QCLot: 795320)</b>						
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLot: 795431)</b>						
Turbidity	---	E121	0.1	NTU	<0.10	---
<b>Physical Tests (QCLot: 796380)</b>						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Physical Tests (QCLot: 797641)</b>						
Colour, apparent	---	E330	2	CU	<2.0	---
<b>Anions and Nutrients (QCLot: 795079)</b>						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Anions and Nutrients (QCLot: 795313)</b>						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 795314)</b>						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 795315)</b>						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 795316)</b>						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 795317)</b>						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 795812)</b>						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Organic / Inorganic Carbon (QCLot: 797178)</b>						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 801731)</b>						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Dissolved Metals (QCLot: 795209)</b>						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 795209) - continued</b>						
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 795209) - continued</b>						
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---
<b>Volatile Organic Compounds (QCLot: 795357)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	---
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	---
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	---
Bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	---
Carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	---
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	---
Chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	---
Chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	---
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	---
Chloromethane	74-87-3	E611D	2	µg/L	<2.0	---
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	---
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	---
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	---
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	---
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	---
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	---
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	---
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	---
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	---
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	---
Hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	---
Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	---
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	---
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	---
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	---
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	---
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	---
Tetrachloroethane, 1,1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 795357) - continued</b>						
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
Vinyl chloride	75-01-4	E611D	0.5	µg/L	<0.50	----
<b>Volatile Organic Compounds (QCLot: 795359)</b>						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
<b>Hydrocarbons (QCLot: 795358)</b>						
VPH C6-C10	n/a	E581.VPH	25	µg/L	<25	----
<b>Hydrocarbons (QCLot: 797079)</b>						
EPH >C10-C16	n/a	E601F	50	µg/L	<50	----
EPH >C16-C21	n/a	E601F	50	µg/L	<50	----
EPH >C21-C32	n/a	E601F	50	µg/L	<50	----
EPH >C34-C50	n/a	E601F	100	µg/L	<100	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 794955)</b>						
Acenaphthene	83-32-9	E641A-L	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A-L	0.01	µg/L	<0.010	----
Acridine	260-94-6	E641A-L	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A-L	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	<0.010	----



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 794955) - continued</b>						
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	µg/L	<0.010	----
Perylene	198-55-0	E641A-L	0.01	µg/L	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	µg/L	<0.010	----
<b>Polychlorinated Biphenyls (QCLot: 795339)</b>						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Physical Tests (QCLot: 795318)</b>									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
<b>Physical Tests (QCLot: 795319)</b>									
Conductivity	----	E100	1	µS/cm	1409 µS/cm	99.6	90.0	110	----
<b>Physical Tests (QCLot: 795320)</b>									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	101	85.0	115	----
<b>Physical Tests (QCLot: 795431)</b>									
Turbidity	----	E121	0.1	NTU	200 NTU	92.4	85.0	115	----
<b>Physical Tests (QCLot: 796380)</b>									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	89.0	85.0	115	----
<b>Physical Tests (QCLot: 797641)</b>									
Colour, apparent	----	E330	2	CU	25 CU	100	70.0	130	----
<b>Anions and Nutrients (QCLot: 795079)</b>									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.5	85.0	115	----
<b>Anions and Nutrients (QCLot: 795313)</b>									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 795314)</b>									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.7	90.0	110	----
<b>Anions and Nutrients (QCLot: 795315)</b>									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	96.2	90.0	110	----
<b>Anions and Nutrients (QCLot: 795316)</b>									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.2	90.0	110	----
<b>Anions and Nutrients (QCLot: 795317)</b>									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 795812)</b>									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.0212 mg/L	98.5	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 797178)</b>									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.7	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 801731)</b>									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 795209)</b>									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	101	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	103	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	106	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	97.1	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	92.1	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	104	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	101	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	104	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	101	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	99.3	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	103	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	103	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	111	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	105	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	106	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	105	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	104	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	105	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	91.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	107	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	95.1	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	104	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	104	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	99.4	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	95.5	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	106	80.0	120	----





Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 795209) - continued</b>									
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	101	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	103	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 795357)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	106	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	92.5	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	76.8	70.0	130	----
Bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	97.2	60.0	140	----
Carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	108	70.0	130	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	96.3	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	86.2	70.0	130	----
Chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	93.5	60.0	140	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	91.9	70.0	130	----
Chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	96.6	60.0	140	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	84.4	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	88.3	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	88.2	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	89.0	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	90.2	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	90.0	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	87.9	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	92.4	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	93.4	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	100.0	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	90.1	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	93.2	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	91.2	70.0	130	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	93.0	70.0	130	----
Hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	81.6	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	97.9	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	84.9	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	95.5	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	83.8	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 795357) - continued</b>									
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	84.3	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	87.8	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	92.1	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	90.2	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	93.4	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	91.2	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	92.1	70.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	101	60.0	140	----
Vinyl chloride	75-01-4	E611D	0.5	µg/L	100 µg/L	94.0	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 795359)</b>									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	88.2	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	89.5	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	90.2	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	91.9	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	88.5	70.0	130	----
<b>Hydrocarbons (QCLot: 795358)</b>									
VPH C6-C10	n/a	E581.VPH	25	µg/L	2000 µg/L	108	80.0	120	----
<b>Hydrocarbons (QCLot: 797079)</b>									
EPH >C10-C16	n/a	E601F	50	µg/L	4273.544 µg/L	89.2	70.0	130	----
EPH >C16-C21	n/a	E601F	50	µg/L	2580.912 µg/L	86.9	70.0	130	----
EPH >C21-C32	n/a	E601F	50	µg/L	2809.123 µg/L	92.2	70.0	130	----
EPH >C34-C50	n/a	E601F	100	µg/L	4092.772 µg/L	81.1	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 794955)</b>									
Acenaphthene	83-32-9	E641A-L	0.01	µg/L	0.5263 µg/L	97.0	50.0	140	----
Acenaphthylene	208-96-8	E641A-L	0.01	µg/L	0.5263 µg/L	96.5	50.0	140	----
Acridine	260-94-6	E641A-L	0.01	µg/L	0.5263 µg/L	113	50.0	140	----
Anthracene	120-12-7	E641A-L	0.01	µg/L	0.5263 µg/L	93.3	50.0	140	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	0.5263 µg/L	107	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	0.5263 µg/L	89.9	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	0.5263 µg/L	96.0	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	0.5263 µg/L	105	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	0.5263 µg/L	91.7	50.0	140	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	0.5263 µg/L	104	50.0	140	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 794955) - continued</b>									
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	0.5263 µg/L	107	50.0	140	----
Fluorene	86-73-7	E641A-L	0.01	µg/L	0.5263 µg/L	104	50.0	140	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	0.5263 µg/L	113	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	0.5263 µg/L	95.3	50.0	140	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	0.5263 µg/L	97.1	50.0	140	----
Naphthalene	91-20-3	E641A-L	0.01	µg/L	0.5263 µg/L	92.2	50.0	140	----
Perylene	198-55-0	E641A-L	0.01	µg/L	0.5263 µg/L	112	50.0	140	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	0.5263 µg/L	105	50.0	140	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	0.5263 µg/L	106	50.0	140	----
Quinoline	91-22-5	E641A-L	0.01	µg/L	0.5263 µg/L	106	50.0	140	----
<b>Polychlorinated Biphenyls (QCLot: 795339)</b>									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	117	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	117	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	117	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	117	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	92.4	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	111	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	133	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	133	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	133	60.0	140	----



### Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 795079)</b>										
HA2300003-001	MW93-1	Ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
<b>Anions and Nutrients (QCLot: 795313)</b>										
HA2300003-002	MW93-1A	Fluoride	16984-48-8	E235.F	0.901 mg/L	1 mg/L	90.1	75.0	125	----
<b>Anions and Nutrients (QCLot: 795314)</b>										
HA2300003-002	MW93-1A	Nitrate (as N)	14797-55-8	E235.NO3	2.30 mg/L	2.5 mg/L	92.0	75.0	125	----
<b>Anions and Nutrients (QCLot: 795315)</b>										
HA2300003-002	MW93-1A	Nitrite (as N)	14797-65-0	E235.NO2	0.501 mg/L	0.5 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 795316)</b>										
HA2300003-002	MW93-1A	Chloride	16887-00-6	E235.Cl	97.1 mg/L	100 mg/L	97.1	75.0	125	----
<b>Anions and Nutrients (QCLot: 795317)</b>										
HA2300003-002	MW93-1A	Sulfate (as SO4)	14808-79-8	E235.SO4	97.7 mg/L	100 mg/L	97.7	75.0	125	----
<b>Anions and Nutrients (QCLot: 795812)</b>										
HA2300003-001	MW93-1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.0196 mg/L	ND	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 797178)</b>										
TY2205202-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 801731)</b>										
HA2300003-001	MW93-1	Carbon, dissolved organic [DOC]	----	E358-L	5.22 mg/L	5 mg/L	104	70.0	130	----
<b>Dissolved Metals (QCLot: 795209)</b>										
HA2300003-002	MW93-1A	Aluminum, dissolved	7429-90-5	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0495 mg/L	0.05 mg/L	98.9	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0578 mg/L	0.05 mg/L	116	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.00485 mg/L	0.005 mg/L	97.0	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0449 mg/L	0.05 mg/L	89.9	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	0.05 mg/L	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00500 mg/L	0.005 mg/L	100	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00254 mg/L	0.0025 mg/L	101	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0125 mg/L	0.0125 mg/L	99.9	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 795209) - continued</b>										
HA2300003-002	MW93-1A	Cobalt, dissolved	7440-48-4	E421	0.0123 mg/L	0.0125 mg/L	98.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0116 mg/L	0.0125 mg/L	92.9	70.0	130	----
		Iron, dissolved	7439-89-6	E421	0.050 mg/L	0.05 mg/L	99.3	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0242 mg/L	0.025 mg/L	97.0	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0125 mg/L	0.0125 mg/L	100	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0240 mg/L	0.025 mg/L	95.9	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	0.561 mg/L	0.5 mg/L	112	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	2.53 mg/L	2.5 mg/L	101	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.00505 mg/L	0.005 mg/L	101	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0619 mg/L	0.05 mg/L	124	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	ND mg/L	0.5 mg/L	ND	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00362 mg/L	0.005 mg/L	72.3	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.00529 mg/L	0.005 mg/L	106	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0472 mg/L	0.05 mg/L	94.4	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.00498 mg/L	0.005 mg/L	99.7	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0256 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0123 mg/L	0.0125 mg/L	98.7	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	ND mg/L	0.005 mg/L	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.00025 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0258 mg/L	0.025 mg/L	103	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.0240 mg/L	0.025 mg/L	96.1	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.00509 mg/L	0.005 mg/L	102	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 795357)</b>										
HA2300002-001	Anonymous	Acetone	67-64-1	E611D	111 µg/L	100 µg/L	111	60.0	140	----
		Bromodichloromethane	75-27-4	E611D	94.2 µg/L	100 µg/L	94.2	60.0	140	----
		Bromoform	75-25-2	E611D	77.2 µg/L	100 µg/L	77.2	60.0	140	----
		Bromomethane	74-83-9	E611D	96.7 µg/L	100 µg/L	96.7	60.0	140	----
		Carbon disulfide	75-15-0	E611D	107 µg/L	100 µg/L	107	60.0	140	----
		Carbon tetrachloride	56-23-5	E611D	95.7 µg/L	100 µg/L	95.7	60.0	140	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 795357) - continued</b>										
HA2300002-001	Anonymous	Chlorobenzene	108-90-7	E611D	86.2 µg/L	100 µg/L	86.2	60.0	140	----
		Chloroethane	75-00-3	E611D	93.1 µg/L	100 µg/L	93.1	60.0	140	----
		Chloroform	67-66-3	E611D	93.1 µg/L	100 µg/L	93.1	60.0	140	----
		Chloromethane	74-87-3	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		Dibromochloromethane	124-48-1	E611D	86.2 µg/L	100 µg/L	86.2	60.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611D	91.3 µg/L	100 µg/L	91.3	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	88.0 µg/L	100 µg/L	88.0	60.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	89.3 µg/L	100 µg/L	89.3	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	90.3 µg/L	100 µg/L	90.3	60.0	140	----
		Dichlorodifluoromethane	75-71-8	E611D	85.5 µg/L	100 µg/L	85.5	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611D	109 µg/L	100 µg/L	109	60.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611D	89.9 µg/L	100 µg/L	89.9	60.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	93.7 µg/L	100 µg/L	93.7	60.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	93.2 µg/L	100 µg/L	93.2	60.0	140	----
		Dichloromethane	75-09-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611D	91.7 µg/L	100 µg/L	91.7	60.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	96.9 µg/L	100 µg/L	96.9	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	----
		Hexane, n-	110-54-3	E611D	91.7 µg/L	100 µg/L	91.7	60.0	140	----
		Hexanone, 2-	591-78-6	E611D	81 µg/L	100 µg/L	81.3	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	86 µg/L	100 µg/L	85.9	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	----
		Styrene	100-42-5	E611D	83.0 µg/L	100 µg/L	83.0	60.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	84.6 µg/L	100 µg/L	84.6	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	86.3 µg/L	100 µg/L	86.3	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	91.0 µg/L	100 µg/L	91.0	60.0	140	----
		Toluene	108-88-3	E611D	90.7 µg/L	100 µg/L	90.7	60.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	93.4 µg/L	100 µg/L	93.4	60.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	93.6 µg/L	100 µg/L	93.6	60.0	140	----
		Trichloroethylene	79-01-6	E611D	91.5 µg/L	100 µg/L	91.5	60.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	99.3 µg/L	100 µg/L	99.3	60.0	140	----
		Vinyl chloride	75-01-4	E611D	92.0 µg/L	100 µg/L	92.0	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 795359)</b>										



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
<b>Volatile Organic Compounds (QCLot: 795359) - continued</b>										
HA2300003-004	MW93-2A	Benzene	71-43-2	E611A	90.5 µg/L	100 µg/L	90.5	60.0	140	----
		Ethylbenzene	100-41-4	E611A	91.8 µg/L	100 µg/L	91.8	60.0	140	----
		Toluene	108-88-3	E611A	91.3 µg/L	100 µg/L	91.3	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	190 µg/L	200 µg/L	94.8	60.0	140	----
		Xylene, o-	95-47-6	E611A	92.6 µg/L	100 µg/L	92.6	60.0	140	----
<b>Hydrocarbons (QCLot: 795358)</b>										
HA2300002-001	Anonymous	VPH C6-C10	n/a	E581.VPH	1860 µg/L	2000 µg/L	93.2	60.0	140	----




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : HA2300003</p> <p><b>Amendment</b> : 1</p> <p><b>Client</b> : Englobe Corp.</p> <p><b>Contact</b> : Mike Smith</p> <p><b>Address</b> : Geotechnical Materials and Environmental Engineering 39 Sagona Avenue Mount Pearl NL Canada A1N 4P9</p> <p><b>Telephone</b> : 709-576-8148</p> <p><b>Project</b> : 2210292.000</p> <p><b>PO</b> : ----</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : Lisa Clancey</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : Landfill Monitoring - Upper Trinity South (New Harbour) and Come By Chance Landfills</p> <p><b>No. of samples received</b> : 4</p> <p><b>No. of samples analysed</b> : 4</p>	<p><b>Page</b> : 1 of 19</p> <p><b>Laboratory</b> : Halifax - Environmental</p> <p><b>Account Manager</b> : Emily Smith</p> <p><b>Address</b> : 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2</p> <p><b>Telephone</b> : +1 902 483 5298</p> <p><b>Date Samples Received</b> : 05-Jan-2023 10:40</p> <p><b>Issue Date</b> : 18-Jan-2023 11:21</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

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### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.



***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

***Outliers : Analysis Holding Time Compliance (Breaches)***

- Analysis Holding Time Outliers exist - please see following pages for full details.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



**Regular Sample Surrogates**

Sub-Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
<b>Samples Submitted</b>							
Hydrocarbons Surrogates	HA2300003-001	MW93-1	isobutylbenzene (EPH)	538-93-2	55.1 %	60.0-140 %	Recovery less than lower data quality objective
Hydrocarbons Surrogates	HA2300003-002	MW93-1A	isobutylbenzene (EPH)	538-93-2	52.3 %	60.0-140 %	Recovery less than lower data quality objective



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW93-1	E298	04-Jan-2023	05-Jan-2023	----	----		06-Jan-2023	28 days	3 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW93-1A	E298	04-Jan-2023	05-Jan-2023	----	----		06-Jan-2023	28 days	3 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW93-2	E298	04-Jan-2023	05-Jan-2023	----	----		06-Jan-2023	28 days	3 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
Amber glass total (sulfuric acid) MW93-2A	E298	04-Jan-2023	05-Jan-2023	----	----		06-Jan-2023	28 days	3 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE MW93-1	E235.Cl	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE MW93-1A	E235.Cl	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓
<b>Anions and Nutrients : Chloride in Water by IC</b>										
HDPE MW93-2	E235.Cl	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE MW93-2A	E235.Cl	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW93-1	E378-U	04-Jan-2023	06-Jan-2023	----	----		09-Jan-2023	3 days	6 days	*	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW93-1A	E378-U	04-Jan-2023	06-Jan-2023	----	----		09-Jan-2023	3 days	6 days	*	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW93-2	E378-U	04-Jan-2023	06-Jan-2023	----	----		09-Jan-2023	3 days	6 days	*	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001</b>											
HDPE MW93-2A	E378-U	04-Jan-2023	06-Jan-2023	----	----		09-Jan-2023	3 days	6 days	*	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW93-1	E235.F	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW93-1A	E235.F	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW93-2	E235.F	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE MW93-2A	E235.F	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE MW93-1	E235.NO3	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE MW93-1A	E235.NO3	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE MW93-2	E235.NO3	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE MW93-2A	E235.NO3	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE MW93-1	E235.NO2	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE MW93-1A	E235.NO2	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE MW93-2	E235.NO2	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE MW93-2A	E235.NO2	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	3 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW93-1	E235.SO4	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW93-1A	E235.SO4	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW93-2	E235.SO4	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE MW93-2A	E235.SO4	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW93-1	E421	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW93-1A	E421	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW93-2	E421	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW93-2A	E421	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	180 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) MW93-1	E611A	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) MW93-1A	E611A	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) MW93-2	E611A	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Hydrocarbons : BTEX by Headspace GC-MS</b>											
Glass vial (sodium bisulfate) MW93-2A	E611A	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-1	E601F	04-Jan-2023	09-Jan-2023	14 days	5 days	✔	12-Jan-2023	40 days	3 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-1A	E601F	04-Jan-2023	09-Jan-2023	14 days	5 days	✔	12-Jan-2023	40 days	3 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-2	E601F	04-Jan-2023	09-Jan-2023	14 days	5 days	✔	12-Jan-2023	40 days	3 days	✔	
<b>Hydrocarbons : EPH by GC-FID (RBCA)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-2A	E601F	04-Jan-2023	09-Jan-2023	14 days	5 days	✔	12-Jan-2023	40 days	3 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW93-1	E581.VPH	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW93-1A	E581.VPH	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW93-2	E581.VPH	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Hydrocarbons : VPH by Headspace GC-FID (RBCA)</b>											
Glass vial (sodium bisulfate) MW93-2A	E581.VPH	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW93-1	E358-L	04-Jan-2023	09-Jan-2023	----	----		09-Jan-2023	28 days	5 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW93-1A	E358-L	04-Jan-2023	09-Jan-2023	----	----		09-Jan-2023	28 days	5 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW93-2	E358-L	04-Jan-2023	09-Jan-2023	----	----		09-Jan-2023	28 days	5 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) MW93-2A	E358-L	04-Jan-2023	09-Jan-2023	----	----		09-Jan-2023	28 days	5 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE MW93-1	E290	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE MW93-1A	E290	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE MW93-2	E290	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	





Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE MW93-2A	E290	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✓	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE MW93-1	E330	04-Jan-2023	----	----	----		09-Jan-2023	48 hrs	138 hrs	* EHTL	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE MW93-1A	E330	04-Jan-2023	----	----	----		09-Jan-2023	48 hrs	138 hrs	* EHTL	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE MW93-2	E330	04-Jan-2023	----	----	----		09-Jan-2023	48 hrs	138 hrs	* EHTL	
<b>Physical Tests : Colour (Apparent) by Spectrometer</b>											
HDPE MW93-2A	E330	04-Jan-2023	----	----	----		09-Jan-2023	48 hrs	138 hrs	* EHTL	
<b>Physical Tests : Conductivity in Water</b>											
HDPE MW93-1	E100	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
HDPE MW93-1A	E100	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
HDPE MW93-2	E100	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
HDPE MW93-2A	E100	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	28 days	2 days	✓	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : pH by Meter</b>											
HDPE MW93-1	E108	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	0.25 hrs	5.25 hrs	*	EHTR-FM
<b>Physical Tests : pH by Meter</b>											
HDPE MW93-1A	E108	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	0.25 hrs	5.25 hrs	*	EHTR-FM
<b>Physical Tests : pH by Meter</b>											
HDPE MW93-2	E108	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	0.25 hrs	5.25 hrs	*	EHTR-FM
<b>Physical Tests : pH by Meter</b>											
HDPE MW93-2A	E108	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	0.25 hrs	5.25 hrs	*	EHTR-FM
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW93-1	E162	04-Jan-2023	----	----	----		07-Jan-2023	7 days	4 days	✓	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW93-1A	E162	04-Jan-2023	----	----	----		07-Jan-2023	7 days	4 days	✓	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW93-2	E162	04-Jan-2023	----	----	----		07-Jan-2023	7 days	4 days	✓	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE MW93-2A	E162	04-Jan-2023	----	----	----		07-Jan-2023	7 days	4 days	✓	
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE MW93-1	E121	04-Jan-2023	----	----	----		06-Jan-2023	3 days	2 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE MW93-1A	E121	04-Jan-2023	----	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE MW93-2	E121	04-Jan-2023	----	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE MW93-2A	E121	04-Jan-2023	----	----	----		06-Jan-2023	3 days	2 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap MW93-1	E687	04-Jan-2023	06-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	0 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap MW93-1A	E687	04-Jan-2023	06-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	0 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap MW93-2	E687	04-Jan-2023	06-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	0 days	✔	
<b>Polychlorinated Biphenyls : PCB Aroclors by GC-MS</b>											
Amber glass/Teflon lined cap MW93-2A	E687	04-Jan-2023	06-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	0 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-1	E641A-L	04-Jan-2023	05-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	1 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
Amber glass/Teflon lined cap (sodium bisulfate) MW93-1A	E641A-L	04-Jan-2023	05-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> MW93-2	E641A-L	04-Jan-2023	05-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	1 days	✔	
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> MW93-2A	E641A-L	04-Jan-2023	05-Jan-2023	14 days	2 days	✔	06-Jan-2023	40 days	1 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW93-1	E611D	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW93-1A	E611D	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW93-2	E611D	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> MW93-2A	E611D	04-Jan-2023	06-Jan-2023	----	----		06-Jan-2023	14 days	2 days	✔	

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended  
 EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.  
 Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	795320	1	9	11.1	5.0	✔
Ammonia by Fluorescence	E298	795079	1	10	10.0	5.0	✔
BTEX by Headspace GC-MS	E611A	795359	1	4	25.0	5.0	✔
Chloride in Water by IC	E235.Cl	795316	1	9	11.1	5.0	✔
Colour (Apparent) by Spectrometer	E330	797641	1	9	11.1	5.0	✔
Conductivity in Water	E100	795319	1	5	20.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	795209	1	7	14.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	797178	2	11	18.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	795812	1	16	6.2	5.0	✔
Fluoride in Water by IC	E235.F	795313	1	7	14.2	5.0	✔
Nitrate in Water by IC	E235.NO3	795314	1	8	12.5	5.0	✔
Nitrite in Water by IC	E235.NO2	795315	1	8	12.5	5.0	✔
pH by Meter	E108	795318	1	11	9.0	5.0	✔
Sulfate in Water by IC	E235.SO4	795317	1	7	14.2	5.0	✔
TDS by Gravimetry	E162	796380	1	10	10.0	5.0	✔
Turbidity by Nephelometry	E121	795431	1	5	20.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	795357	1	8	12.5	5.0	✔
VPH by Headspace GC-FID (RBCA)	E581.VPH	795358	1	8	12.5	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	795320	1	9	11.1	5.0	✔
Ammonia by Fluorescence	E298	795079	1	10	10.0	5.0	✔
BTEX by Headspace GC-MS	E611A	795359	1	4	25.0	5.0	✔
Chloride in Water by IC	E235.Cl	795316	1	9	11.1	5.0	✔
Colour (Apparent) by Spectrometer	E330	797641	1	9	11.1	5.0	✔
Conductivity in Water	E100	795319	1	5	20.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	795209	1	7	14.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	797178	2	11	18.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	795812	1	16	6.2	5.0	✔
EPH by GC-FID (RBCA)	E601F	797079	1	8	12.5	5.0	✔
Fluoride in Water by IC	E235.F	795313	1	7	14.2	5.0	✔
Nitrate in Water by IC	E235.NO3	795314	1	8	12.5	5.0	✔
Nitrite in Water by IC	E235.NO2	795315	1	8	12.5	5.0	✔
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	794955	1	4	25.0	5.0	✔
PCB Aroclors by GC-MS	E687	795339	1	7	14.2	4.7	✔
pH by Meter	E108	795318	1	11	9.0	5.0	✔
Sulfate in Water by IC	E235.SO4	795317	1	7	14.2	5.0	✔



Matrix: **Water** Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
TDS by Gravimetry	E162	796380	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	795431	1	5	20.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	795357	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	795358	1	8	12.5	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	795320	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	795079	1	10	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	795359	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	795316	1	9	11.1	5.0	✓
Colour (Apparent) by Spectrometer	E330	797641	1	9	11.1	5.0	✓
Conductivity in Water	E100	795319	1	5	20.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	795209	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	797178	2	11	18.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	795812	1	16	6.2	5.0	✓
EPH by GC-FID (RBCA)	E601F	797079	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	795313	1	7	14.2	5.0	✓
Nitrate in Water by IC	E235.NO3	795314	1	8	12.5	5.0	✓
Nitrite in Water by IC	E235.NO2	795315	1	8	12.5	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	794955	1	4	25.0	5.0	✓
PCB Aroclors by GC-MS	E687	795339	1	7	14.2	4.7	✓
Sulfate in Water by IC	E235.SO4	795317	1	7	14.2	5.0	✓
TDS by Gravimetry	E162	796380	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	795431	1	5	20.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	795357	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	795358	1	8	12.5	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	795079	1	10	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	795359	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	795316	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	795209	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	797178	2	11	18.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	795812	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	795313	1	7	14.2	5.0	✓
Nitrate in Water by IC	E235.NO3	795314	1	8	12.5	5.0	✓
Nitrite in Water by IC	E235.NO2	795315	1	8	12.5	5.0	✓
Sulfate in Water by IC	E235.SO4	795317	1	7	14.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	795357	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	795358	1	8	12.5	5.0	✓



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Waterloo - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Waterloo - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 Waterloo - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Waterloo - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Waterloo - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 Waterloo - Environmental	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters.  Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Waterloo - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Waterloo - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Dissolved Metals in Water by CRC ICPMS	E421 Waterloo - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
VPH by Headspace GC-FID (RBCA)	E581.VPH Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH by GC-FID (RBCA)	E601F Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.
BTEX by Headspace GC-MS	E611A Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.





Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L  Waterloo - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
PCB Aroclors by GC-MS	E687  Waterloo - Environmental	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Ion Balance using Dissolved Metals	EC101  Waterloo - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Langelier Index using Laboratory pH (Ca-D)	EC105  Waterloo - Environmental	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO <sub>3</sub> . Negative values indicate undersaturation of CaCO <sub>3</sub> . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. If available, Field pH measurements are recommended for best accuracy (test code EC104).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N  Waterloo - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Dissolved Silicon as Silica (Calculation)	EC421.SiO <sub>2</sub>  Waterloo - Environmental	Water	N/A	Dissolved Silicon (as SiO <sub>2</sub> ) is a calculated parameter. Dissolved Silicon (as SiO <sub>2</sub> mg/L) = 2.139 x Dissolved Silicon (mg/L).
VPH C6-C10 (less BTEX) [RBCA]	EC580C  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Modified TPH (RBCA) Tier I	EC581D  Waterloo - Environmental	Water	Atlantic RBCA Version 3.1	Modified TPH (PIRI), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) + (>C16 - C21) + (>C21 - C32).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298  Waterloo - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



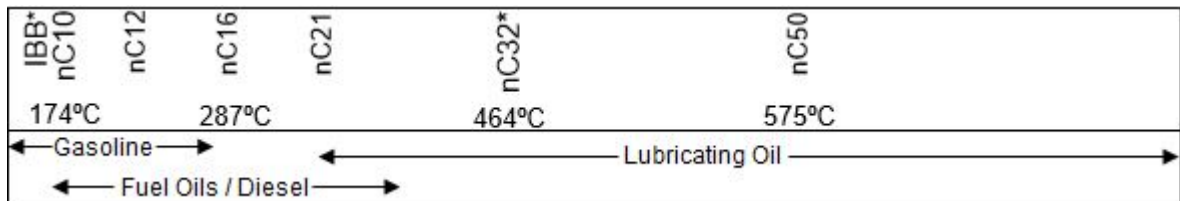
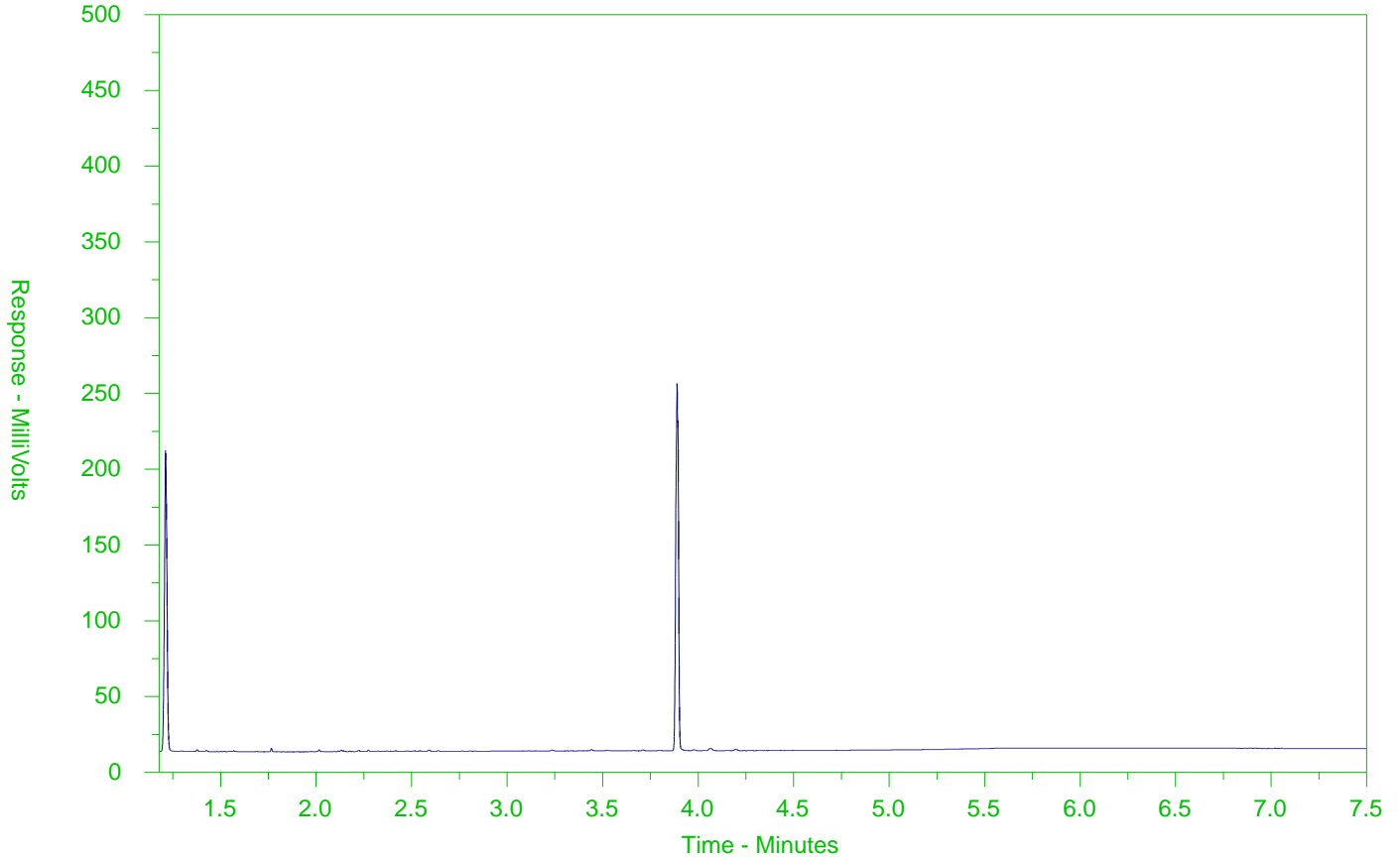
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Dissolved Organic Carbon for Combustion	EP358 Waterloo - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Waterloo - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Waterloo - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
PHCs Hexane Extraction (RBCA)	EP601F Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) are extracted using a hexane liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 Waterloo - Environmental	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2300003-001-E601F  
Client Sample ID: MW93-1



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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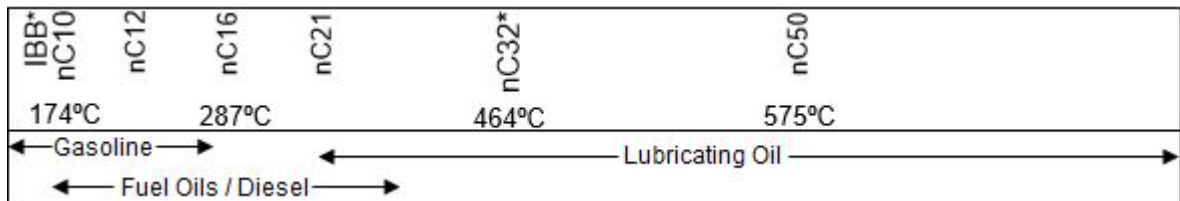
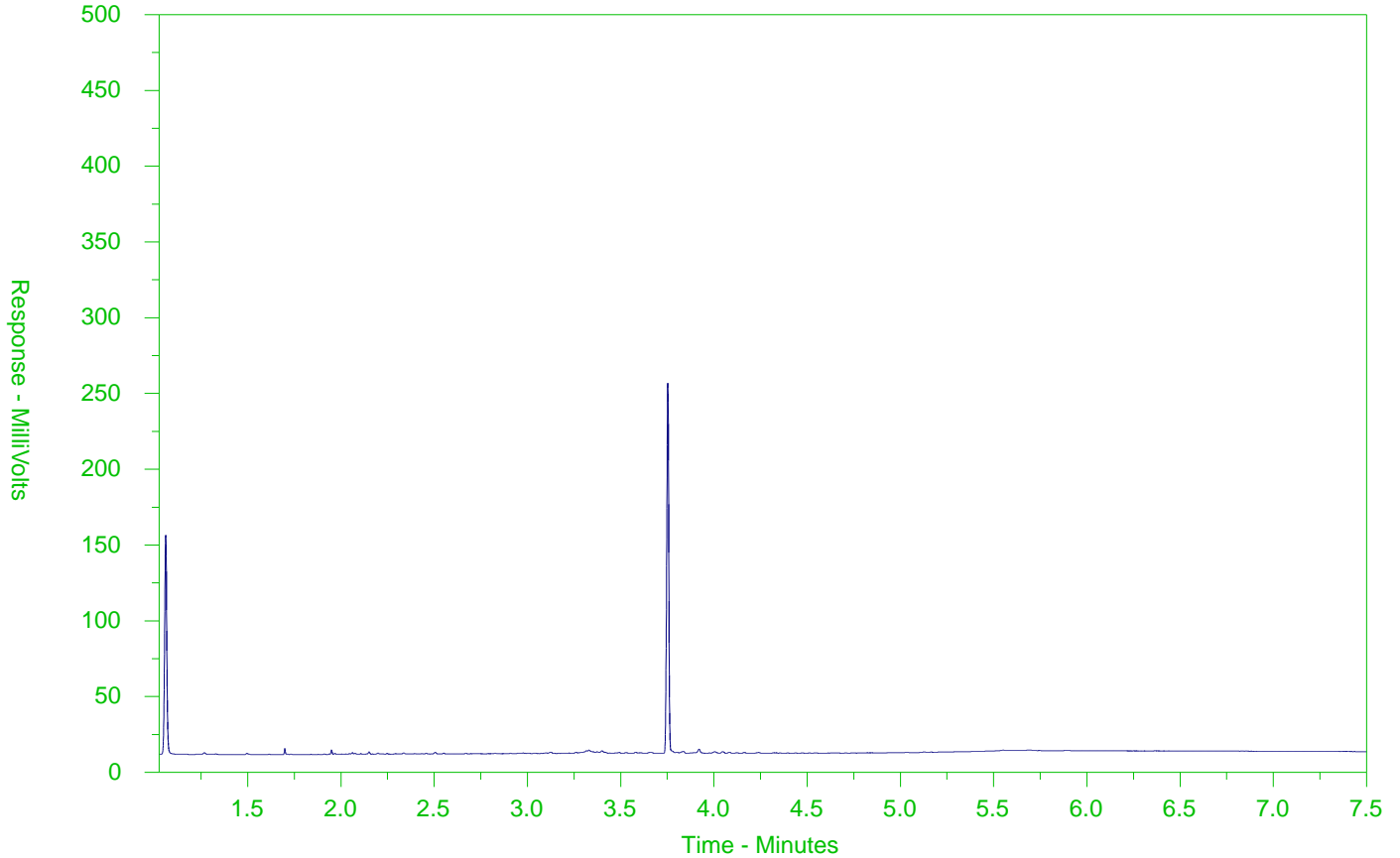
extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2300003-002-E601F  
Client Sample ID: MW93-1A



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

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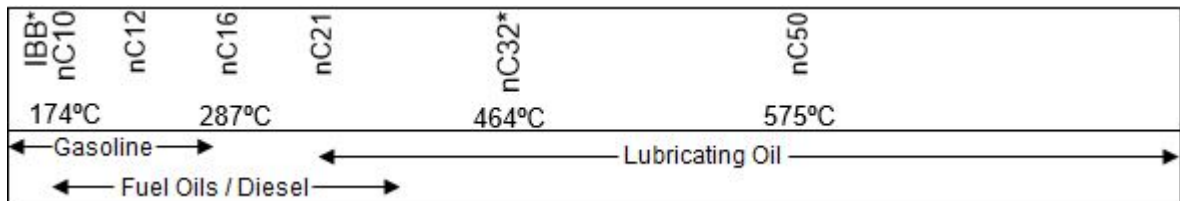
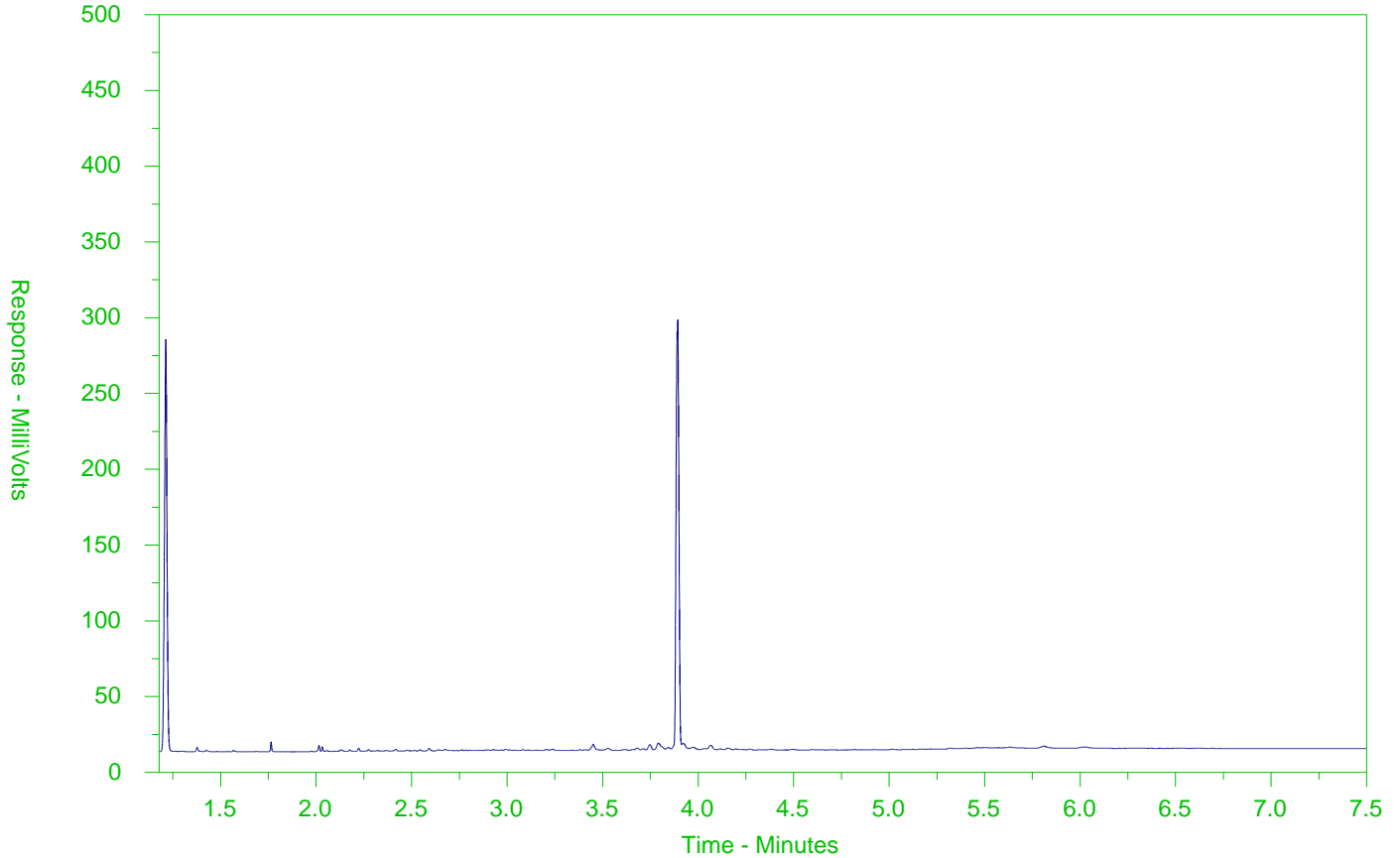
extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2300003-003-E601F  
Client Sample ID: MW93-2



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

---

extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.

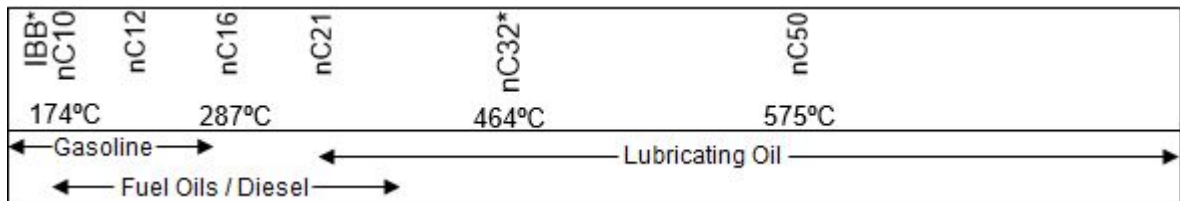
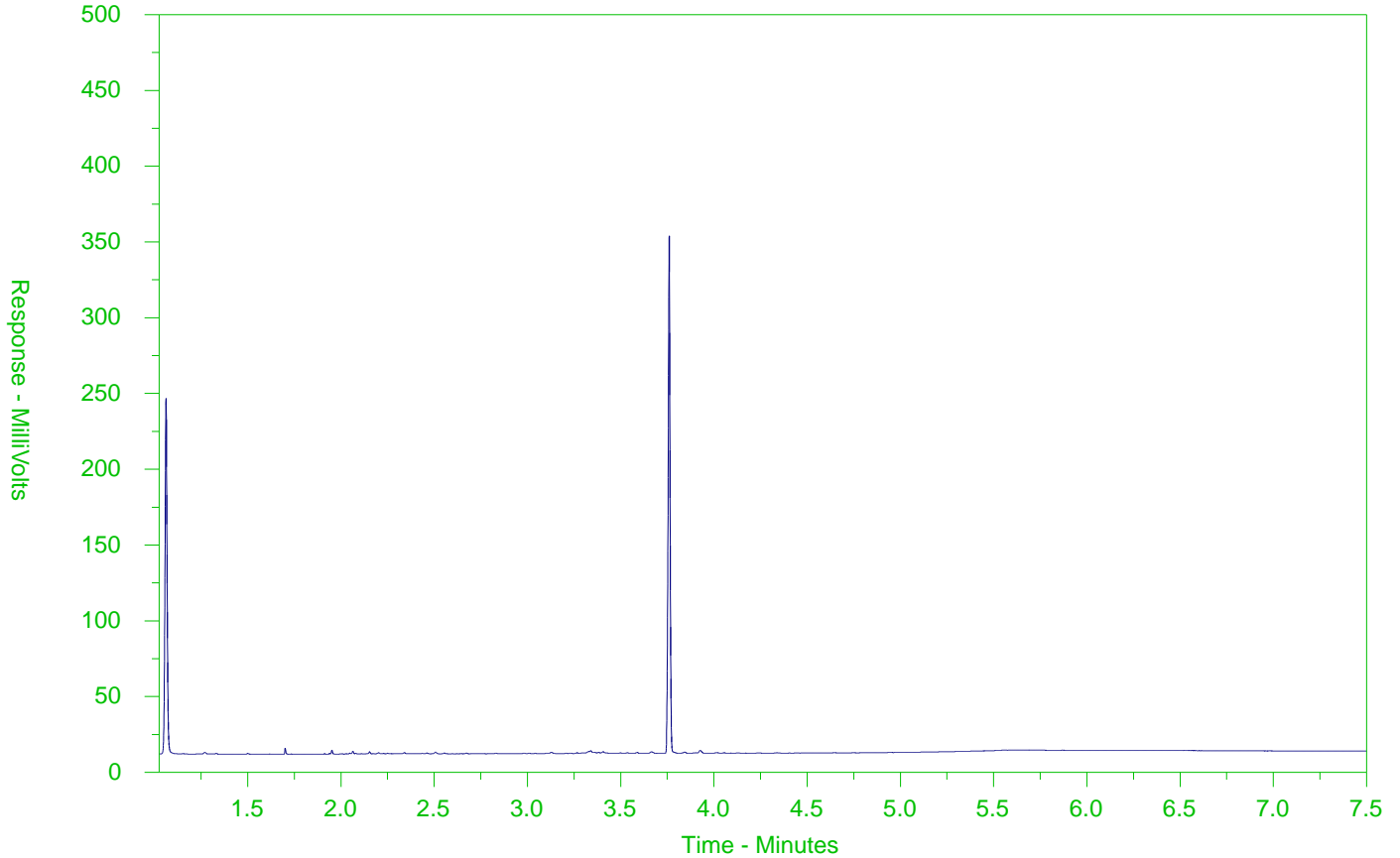


# ALS Environmental RBCA HYDROCARBON DISTRIBUTION REPORT



right solutions.  
right partner.

ALS Sample ID: HA2300003-004-E601F  
Client Sample ID: MW93-2A



The RBCA Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. This chromatogram was produced using GC conditions that are specific to ALS Canada's RBCA and CCME methods. Refer to the ALS Canada F2-F4 / RBCA Library to help determine likely contamination sources. The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

The scale at the bottom of the chromatogram shows boiling points of common petroleum products, with approximate retention times of n-alkane hydrocarbon marker compounds. Surrogates (added by the lab as QC) are shown with a "\*". Peak heights (millivolts) are a function of sample concentration, the amount of sample

Chrom Perfect Chromatogram Report

---

extracted, and the sample dilution factor. Please note that retention times may vary as much as 0.5 minutes due to minor changes in instrument conditions.



www.alsglobal.com

### Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 1

Page

Environmental Division  
Halifax

Work Order Reference  
**HA2300003**



Telephone : + 1 902 483 5298

<b>Report To</b> Contact and company name below will appear on the final report			<b>Report Format / Distribution</b>			<b>Select Service Level Below - Contact your AM to c</b>															
Company: Englobe Corp.			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm -															
Contact: Mike Smith			Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			<b>PRIORITY (Business Day)</b>	4 day [P4-20%] <input type="checkbox"/>	<b>EMERGENCY</b>	1 Business d												
Phone: 709-743-6096			<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>		Same Day, W (Laboratory o												
Company address below will appear on the final report			Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				2 day [P2-50%] <input type="checkbox"/>														
Street: 39 Sagona Ave			Email 1 or Fax: Michael.Smith2@englobecorp.com			<b>Date and Time Required for all E&amp;P TATs:</b>															
City/Province: Mount Pearl, NL			Email 2: lisa.clancey@englobecorp.com			For tests that can not be performed according to the service level select															
Postal Code: A1N 4P9			Email 3			<b>Analysis Request</b>															
Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			<b>Invoice Distribution</b>			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below															
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			<b>NUMBER OF CONTAINERS</b>															
Company:			Email 1 or Fax: cp.factures@englobecorp.com				Groundwater														
Contact:			Email 2: Michael.Smith2@englobecorp.com				General Chemistry with Dissolved Metals														
<b>Project Information</b>			<b>Oil and Gas Required Fields (client use)</b>				BTEX/TPH (RBCA Tier 1) in Water														
ALS Account # / Quote #: HA2022ENGL1000001			AFE/Cost Center: PO#				VOCs in Water - Full List														
Job #: 2210292, COC			Major/Minor Code: Routing Code:				PAHs in Water														
PO / AFE:			Requisitioner:				PCBs in Water														
LSD:			Location:																		
ALS Lab Work Order # (lab use only): HA2300003 R			ALS Contact: Emily Smith																		
			Sampler: Lisa Clancey																		
<b>ALS Sample # (lab use only)</b>	<b>Sample Identification and/or Coordinates (This description will appear on the report)</b>	<b>Date (dd-mmm-yy)</b>	<b>Time (hh:mm)</b>	<b>Sample Type</b>																	
MW93-1		4-Jan-23		Water	10		R	R	R	R	R										
MW93-1A		4-Jan-23		Water	10		R	R	R	R	R										
MW93-2		4-Jan-23		Water	10		R	R	R	R	R										
MW93-2a		4-Jan-23		Water	10		R	R	R	R	R										
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>			<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>			<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>															
						Cooling Initiated <input type="checkbox"/>															
						INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C												
									B.7												
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>			<b>FINAL SHIPMENT RECEPTION (lab use only)</b>															
Released by: Lisa Clancey		Date: Jan 4/23 15:30	Time:	Received by:		Date:	Time:	Received by: Sheila		Date: Jan. 05. 23	Time: 9:40										

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION  
 WHITE - LABORATORY COPY YELLOW - CLIENT COPY  
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.  
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.  
 OR-211 ; VW-239; GC-290; MM-547; N-507

# Appendix E

## Historical Analytical Tables



TABLE D1

HISTORICAL STATIC GROUNDWATER LEVELS (2004 - 2023)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Location	Ground Surface Elevation	Length of Stick-up	TOC Elevation	Groundwater Depth (mbToC)																					
				Mar	Jul	Sep	Oct	Jun	Jul	Oct	Dec	Oct	Sep	Mar	Jul	Dec	Sep	Dec	Aug	Nov	Dec	Oct	Dec	Dec / Jan	
				2004				2006				2007	2008	2009	2010		2011	2012	2013	2014	2015	2017	2021	2022 / 2023	
(masl)	(m)	(masl)																							
PLCS	15.960	--	15.960	--	--	--	--	--	--	--	--	--	--	--	--	0.55	0.73	0.59	0.89	0.55	0.403	-	0.45	-	0.28
SLCS	15.955	--	15.955	--	--	--	--	--	--	--	--	--	--	--	--	0.52	0.713	0.55	0.892	0.549	0.404	-	0.451	-	0.32
MW 93-1	16.300	1.100	17.400	--	--	--	--	--	--	--	--	--	--	--	1.975	1.703	1.915	1.921	1.780	1.756	1.616	-	1.760	1.580	1.760
MW 93-1A	16.310	1.400	17.710	0.39	1.88	0.41	0.16	2.06	1.68	2.11	1.84	1.67	2.17	2.50	1.638	1.636	2.204	1.669	1.815	1.688	2.045	2.030	1.700	2.025	
MW 93-2	14.290	1.100	15.390	0.67	0.56	0.58	0.28	1.85	2.16	2.13	--	1.72	2.18	2.20	2.084	2.147	--	2.111	2.323	2.035	-	2.235	2.120	1.345	
MW 93-2A	14.310	1.100	15.410	--	--	--	--	--	--	--	--	--	--	1.84	1.456	1.375	--	1.234	1.663	1.181	1.625	1.792	1.400	1.685	
MW 93-3*	--	--	--	--	--	--	--	--	--	--	--	--	--	1.335	--	--	--	--	--	--	--	--	--	--	
MW 93-3A*	--	--	--	2.37	Dry	--	1.20	Dry	3.21	3.37	--	3.32	Dry	3.52	--	--	--	--	--	--	--	--	--	--	
MW 10-1	15.790	0.846	16.636	--	--	--	--	--	--	--	--	--	--	--	3.015	3.254	3.551	3.188	3.427	2.999	-	3.464	2.950	2.585	
MW 10-1A	15.890	0.854	16.744	--	--	--	--	--	--	--	--	--	--	--	3.084	3.279	3.662	3.234	3.513	3.047	3.475	3.503	2.840	2.586	

Location	Ground Surface Elevation	Length of Stick-up	TOC Elevation	Groundwater Elevation (masl)																					
				Mar	Jul	Sep	Oct	Jun	Jul	Oct	Dec	Oct	Sep	Mar	Jul	Dec	Sep	Dec	Aug	Nov	Dec	Oct	Dec	Dec / Jan	
				2004				2006				2007	2008	2009	2010		2011	2012	2013	2014	2015	2017	2021	2022 / 2023	
(masl)	(m)	(masl)																							
PLCS	15.960	--	15.960	--	--	--	--	--	--	--	--	--	--	--	--	15.410	15.230	15.370	15.070	15.410	15.557	-	15.510	-	15.680
SLCS	15.955	--	15.955	--	--	--	--	--	--	--	--	--	--	--	--	15.435	15.242	15.405	15.063	15.406	15.556	-	15.504	-	15.640
MW 93-1	16.300	1.100	17.400	--	--	--	--	--	--	--	--	--	--	--	15.425	15.697	15.485	15.479	15.620	15.644	14.344	-	14.540	14.380	15.640
MW 93-1A	16.310	1.400	17.710	17.320	15.830	17.300	17.550	15.650	16.030	15.600	15.870	16.040	15.540	15.210	16.072	16.074	15.506	16.041	15.895	14.272	-2.045	14.280	14.260	15.685	
MW 93-2	14.290	1.100	15.390	14.720	14.830	14.810	15.110	13.540	13.230	13.260	--	13.670	13.210	13.190	13.306	13.243	--	13.279	13.067	13.925	-	12.055	13.840	14.045	
MW 93-2A	14.310	1.100	15.410	--	--	--	--	--	--	--	--	--	--	13.570	13.954	14.035	--	14.176	13.747	14.779	-1.625	12.518	14.560	13.725	
MW 93-3*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW 93-3A*	--	--	15.900	13.530	Dry	--	14.700	Dry	12.690	12.530	--	12.580	Dry	12.380	--	--	--	--	--	--	--	--	--	--	
MW 10-1	15.790	0.846	16.636	--	--	--	--	--	--	--	--	--	--	--	13.621	13.382	13.085	13.448	13.209	12.961	-	12.326	13.010	14.051	
MW 10-1A	15.890	0.854	16.744	--	--	--	--	--	--	--	--	--	--	--	13.660	13.465	13.082	13.510	13.231	12.913	-3.475	12.387	13.120	14.158	

Notes:  
 PLCS = Primary Leachate Collection System Valve Chamber      m = Metres      masl = Metres Above Sea Level  
 SLCS = Secondary Leachate Collection System Valve Chamber      TOC = Top of Casing      mbTOC = Metres Below Top of Casing  
 MW = Monitor Well  
 - = Information not provided within historical reports  
 \* = Monitor Well Decommissioned in July 2010

TABLE D2

HISTORICAL GROUNDWATER ANALYTICAL (2009 - 2017) - BTEX/mTPH  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl- benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)				Modified TPH	Comments
						F1 C <sub>6</sub> -C <sub>10</sub>	F2 C <sub>10</sub> -C <sub>16</sub>	F3 C <sub>16</sub> -C <sub>21</sub>	C <sub>21</sub> -C <sub>32</sub>		
MW 93-1A	Aug 19, 2009 <sup>1</sup>	<	<	<	<	<	<	<	<	<	-
	Jul 16, 2010	<	<	<	<	<	<	<	<	<	-
	Dec 13, 2010	<	<	<	<	<	<	<	<	<	-
	Sep 02, 2011	<	<	<	<	<	<	<	<	<	-
	Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<	<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 15, 2015	<	<	<	<	<	<	<	<	<	-
	Oct 12, 2017	<	<	<	<	<	<	<	<	<	-
	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05) <sup>2</sup>	<(0.05) <sup>2</sup>	<(0.05) <sup>2</sup>	<(0.15) <sup>2</sup>	<	-
	Aug 19, 2009	<	<	<	<	<	<	<	<	<	-
	Jul 16, 2010	<	<	<	<	<	<	<	<	<	-
Dec 13, 2010	<	<	<	<	<	<	<	<	<	-	
Sep 02, 2011	<	<	<	<	<	<	<	<	<	-	
Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<	<	<	-	
DUP-03	Aug 30, 2012	<	<	<	<	<	<	<	<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 15, 2015	<	<	<	<	<	<	<	<	<	-
	Oct 12, 2017	<	<	<	<	<	<	<	<	<	-
	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05) <sup>2</sup>	<(0.05) <sup>2</sup>	<(0.05) <sup>2</sup>	<(0.15) <sup>2</sup>	<	-
MW 93-2	Aug 19, 2009	<	<	<	<	<	<	<	<	<	-
	Jul 16, 2010	<	<	<	<	<	<	<	<	<	-
	Jul 16, 2010 <sup>4</sup>	-	-	-	-	-	-	-	-	-	-
	Dec 13, 2010	<	<	<	<	<	<	<	<	<	-
	Dec 13, 2010 <sup>4</sup>	-	-	-	-	-	-	-	-	-	-
	Sep 02, 2011	<	<	<	<	<	<	<	<	<	-
	Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<	<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 15, 2015	<	<	<	<	<	<	<	<	<	-
	Oct 12, 2017	<	<	<	<	<	<	<	<	<	-
	MW 93-2A	Aug 19, 2009	<	<	<	<	<	<	<	<	<
Jul 16, 2010		<	<	<	<	<	<	<	<	<	-
Dec 13, 2010		<	<	<	<	<	<	<	<	<	-
Sep 02, 2011		<	<	<	<	<	<	<	<	<	-
Aug 30, 2012		<	<	<	<	<	<	<	<	<	-
Aug 28, 2013		<	<	<	<	<	<	<	<	<	-
Nov 25, 2014		<	<	<	<	<	<	<	<	<	-
Dec 15, 2015		<	<	<	<	<	<	<	<	<	-
Oct 12, 2017		<	<	<	<	<	<	<	<	<	-
MW 10-1		Jul 16, 2010	<	<	<	<	<	<	<	<	<
	Jul 16, 2010 <sup>4</sup>	<	<	<	<	<	<	<	<	<	-
	Dec 13, 2010	<	<	<	<	<	<	<	<	<	-
	Sep 02, 2011	<	<	<	<	<	<	0.4	0.4	0.4	Possible LO fraction
	Aug 30, 2012	<	<	<	<	<	<	<	<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
DUP-05	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	0.1	0.1	No resemblance to petroleum products in lube oil range
	Dec 15, 2015	<	<	<	<	<	<	<	<	<	-
	Oct 12, 2017	<	<	<	<	<	<	<	<	<	-
DUP-07	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
MW 10-1A	Jul 16, 2010	<	<	<	<	<	<	<	<	<	-
	Dec 13, 2010	<	<	<	<	<	<	<	<	<	-
	Dec 13, 2010 <sup>4</sup>	<	<	<	<	<	<	<	<	<	-
	Sep 02, 2011	<	<	<	<	<	<	<	<	<	-
	Aug 30, 2012	<	<	<	<	<	<	<	<	<	-
DUP- A	Sep 02, 2011	<	<	<	<	<	<	<	<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 15, 2015	<	<	<	<	<	<	<	<	<	-
	Oct 12, 2017	<	<	<	<	<	<	<	<	<	-
Atlantic RBCA Tier I RBSLs <sup>*</sup>		6.9	20	20	20	na	na	na	na	20	Gasoline
										20	Diesel / #2 Fuel Oil
										20	# 6 Oil

Notes:

Analysis completed by Maxam Analytics Inc. laboratory in St. John's, NL.

- Field Duplicate
  - Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report
  - Lab Duplicate
- DUP-A= Field Dup of MW 10-1A  
 DUP-03= Field Dup of MW 93-1A  
 DUP-05= Field Dup of MW 10-1  
 DUP-07 = Field Dup of MW 10-01  
<sup>\*</sup> 2012 Atlantic Risk-Based Corrective Action (RBCA) Tier I Risk-Based Screening Level (RBSL) Table values (commercial/non-potable/coarse grained soil).

G = Gasoline  
 FO = Fuel Oil  
 LO = Lube Oil  
 W = Weathered

RDL = Reportable Detection Limit  
 < = Parameter below detection limit  
 - = Not analysed

0.0 = above criteria

TABLE D2  
 HISTORICAL GROUNDWATER ANALYTICAL (2021 - 2023) - BTEX/mTPH  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NJ

PARAMETER	RDL	UNITS	RBCA Human-Health TIER I EQSs 1	RBCA Ecological Tier I EQS		MW10-01		MW10-01A		MW10-01(DUP)		MW93-1		MW93-1A		MW93-2		MW93-2A		
				Fresh Water 2	Marine Water 3	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	
BTEX	Benzene	0.00050	mg/L	6.3	4.6	4.6	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050
	Toluene	0.00050	mg/L	20	4.2	4.2	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050
	Ethylbenzene	0.00050	mg/L	20	3.2	3.2	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050
	Xylenes	0.00050	mg/L	20	2.8	2.8	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050	<	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>6</sub> -C <sub>10</sub> )	0.025	mg/L	-	-	-	<	<0.025	<	<0.025	<	<0.025	<	<0.025	<	<0.025	<	<0.025	<	<0.025
	Fuel Range (C <sub>10</sub> -C <sub>14</sub> )	0.050	mg/L	-	-	-	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050
	Fuel Range (C <sub>14</sub> -C <sub>21</sub> )	0.050	mg/L	-	-	-	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050
	Lube Range (C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-	-	-	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050	<	<0.050
Total Modified TPH	0.090	mg/L	20 as gas 20 as fuel oil 20 as lube oil	13 as gas 0.84 as fuel oil 0.48 as lube oil		<	<0.090	<	<0.090	<	<0.090	<	<0.090	<	<0.090	<	<0.090	<	<0.090	
Reached Baseline at C32	-	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product Resemblance	none	-	-	-	-	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	

Notes:  
 \* Indicates field duplicate.  
 1 Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for Groundwater for a commercial site with non-potable groundwater usage and coarse-grained soil (July 2021).  
 2 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021).  
 3 - = No applicable guideline or parameter not defined.

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL (2009 - 2014) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1								MW 93-1A										
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014	Dec 12, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<	<	<	<	0.01	<	<	<	<0.04	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	-	-	<	<	-	-	<	<	-	-	<	<	-	-	-	<	<	<	<
Anthracene	0.01	2	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<	0.01	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<	0.02	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<	<	<
Chrysene	0.01	1	<	<	<	<	<	<	<	<	<0.04	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	<	0.03	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	<	<
Phenanthrene	0.01	580	0.01	<	<	<	<	<	<	<	<0.04	0.01	<	<	<	<	<	<	<	0.013	<
Pyrene	0.01	68	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<	<	<
Quinoline	0.05	-	-	-	<	<	-	-	-	-	-	-	<	<	-	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(#) = Parameter below AMEC laboratory detection limit

0.0 = above criteria

DUP-01 = Field Duplicate of MW 10-1, First Sampling Event

DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event

DUP-A= Field Duplicate of MW-101A

DUP-03= Field Duplicate of MW 93-1A

DUP-05= Field Duplicate of MW 10-1

DUP-07 = Field Duplicate of MW 10-1

(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference



TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL (2009 - 2014) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2									MW 93-2A								
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 12, 2017	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Dec 12, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	1,800	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	-	-	<	<	-	-	<	<	<	-	<	<	-	-	<	<	<	<
Anthracene	0.01	2	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	-	-	-	-	-	-	-	<	-	-	-	-	-	-	-	-	<
Chrysene	0.01	1	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	0.02	<	<	<	<	<
Phenanthrene	0.01	580	<0.04	0.01	<	<	<	<	<	<	<	0.01	<	<	<	0.012	<	<	<	<
Pyrene	0.01	68	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Quinoline	0.05	-	-	-	<	<	-	-	-	-	-	-	<	<	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(#) = Parameter below AMEC laboratory detection limit

0.0 = above criteria

DUP-01 = Field Duplicate of MW 10-1, First Sampling Event

DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event

DUP-A= Field Duplicate of MW-101A

DUP-03= Field Duplicate of MW 93-1A

DUP-05= Field Duplicate of MW 10-1

DUP-07 = Field Duplicate of MW 10-1

(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL (2009 - 2014) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 10-1											MW 10-1A							
			Jul 16, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 Dup-07	Oct 12, 2017	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014	Dec 12, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	<	<	<	<	<	-	-	<	<	<	<	<	<	-	-	<	<	<	<
Anthracene	0.01	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	-	-	-	-	-	-	-	-	<	<	-	-	-	-	-	-	<	<
Chrysene	0.01	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.03	<
Perylene	0.01	-	<	<	<	0.04	<	<	<	<	<	<	<	<	<	<	<	0.019	<	<	<
Phenanthrene	0.01	580	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.013	<	<	<
Pyrene	0.01	68	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Quinoline	0.05	-	<	<	<	<	<	-	-	-	<	-	-	-	<	<	<	<	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(#)= Parameter below AMEC laboratory detection limit

0.0 = above criteria

DUP-01 = Field Duplicate of MW 10-1, First Sampling Event

DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event

DUP-A= Field Duplicate of MW-101A

DUP-03= Field Duplicate of MW 93-1A

DUP-05= Field Duplicate of MW 10-1

DUP-07 = Field Duplicate of MW 10-1

(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL (2021 - 2023) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Human Health-Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date												
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01		MW10-01A		MW10-01(DUP)	MW93-1		MW93-1A		MW93-2		MW93-2A	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23
1-Methylnaphthalene	0.01	ug/L	-	20	10	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
2-Methylnaphthalene	0.01	ug/L	-	20	10	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acenaphthene	0.01	ug/L	-	58	60	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acenaphthylene	0.01	ug/L	7,500	-	-	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acridine	0.01	ug/L				<0.01		<0.01			<0.01		<0.01		<0.01		<0.01	
Anthracene	0.01	ug/L	NGR	0.12	1	<0.012	<0.010	<0.012	<0.010	<0.010	<0.012	<0.010	<0.012	<0.010	<0.012	<0.010	<0.012	<0.010
Benzo(a)anthracene	0.01	ug/L	-	0.18	-	<0.018	<0.010	<0.018	<0.010	<0.010	<0.018	<0.010	<0.018	<0.010	<0.018	<0.010	<0.018	<0.010
Benzo(a)pyrene	0.005	ug/L	-	0.15	0.1	<0.01	<0.0050	<0.01	<0.0050	<0.0050	<0.01	<0.0050	<0.01	<0.0050	<0.01	<0.0050	<0.01	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	-	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
Benzo(j+k)fluoranthene	0.02	ug/L				<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
Benzo(e)pyrene	0.01	ug/L				<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
Benzo(b/j)fluoranthene	0.01	ug/L	-	-	-	-	<0.010	-	<0.010	<0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010
Benzo(j+k)fluoranthene	0.01	ug/L				-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(e)pyrene	0.01	ug/L				<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
Benzo(g,h,i)perylene	0.01	ug/L	-	-	-	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	-	-	<0.010	-	<0.010	<0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010
Chrysene	0.01	ug/L	-	1	1	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	-	<0.01	<0.0050	<0.01	<0.0050	<0.0050	<0.01	<0.0050	<0.01	<0.0050	<0.01	<0.0050	<0.01	<0.0050
Fluoranthene	0.01	ug/L	-	0.4	2	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Fluorene	0.01	ug/L	-	30	120	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	-	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Naphthalene	0.01	ug/L	7,000	11	14	<0.01	0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Perylene	0.01	ug/L	-	-	-	<0.01	<0.010	<0.01	0.020	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	0.048	<0.01	<0.010
Phenanthrene	0.01	ug/L	-	4	3	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Pyrene	0.01	ug/L	-	0.25	0.2	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Quinoline	1.01	ug/L	-	-	-	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010

Notes:  
 \* Indicates field duplicate sample.  
 1 Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).  
 2,3 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).  
 - = No applicable guideline or parameter not defined.

**TABLE D4**  
**GROUNDWATER ANALYTICAL (2009 - 2017) - PCBs**  
**2022/23 MONITORING AND MAINTENANCE PROGRAM**  
**COME BY CHANCE SECURE LANDFILL**  
**COME BY CHANCE, NL**

Sample Location	Date Sampled	Total Polychlorinated Biphenyls
MW 93-1	Aug 19, 2009	<
	Aug 19, 2009	< <sup>1</sup>
	Aug 19, 2009	< <sup>2</sup>
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
MW 93-1A	AMEC 2008	<0.04
	Aug 19, 2009	0.1
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
DUP-03	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
	Dec 08, 2015	<
	Oct 12, 2017	<
MW 93-2	AMEC 2008	<0.04
	Aug 19, 2009	<
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
	Oct 12, 2017	<
MW 93-2A	Aug 19, 2009	0.11
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
	Dec 08, 2015	<
	Oct 12, 2017	<
MW 10-1	Jul 16, 2010	<
	Jul 16, 2010	< <sup>2</sup>
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
DUP-05	Aug 28, 2013	<
DUP-07	Nov 25, 2014	<
	Oct 12, 2017	<
MW 10-1A	Jul 16, 2010	<
	Dec 13, 2010	<
	Dec 13, 2010	< <sup>2</sup>
	Sep 02, 2011	<
	Aug 30, 2012	<
DUP-A	Sep 02, 2011	<
	Aug 28, 2013	<
	Nov 25, 2014	<
	Dec 08, 2015	<
	Oct 12, 2017	<
<b>RDL</b>		<b>0.05</b>
<b>Criteria - Ontario MOE</b>		<b>7.8</b>

**Notes:**

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

1. Lab Duplicate
2. Field Duplicate

\* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3. Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

MW = Monitor Well

DUP-01 = Field Duplicate of MW 10-1, First Sampling Event

DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event

DUP-A = Field Duplicate of MW 10-1A

DUP-03 = Field Duplicate of PLCS

DUP-04 = Field Duplicate of PLCS

DUP-05 = Field Duplicate of MW 10-1

DUP-07 = Field Duplicate of MW 10-1

RDL = Reportable Detection Limit

&lt; = Parameter below detection limit

0.0 = above criteria

**TABLE D4**  
**GROUNDWATER ANALYTICAL (2021 - 2023) - PCBs**  
**2022/23 MONITORING AND MAINTENANCE PROGRAM**  
**COME BY CHANCE SECURE LANDFILL**  
**COME BY CHANCE, NL**

PARAMETER	RDL	UNITS	RBCA Human Health-Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date												
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01		MW10-01A		MW10-01(DUP)	MW93-1		MW93-1A		MW93-2		MW93-2A	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23
Total Polychlorinated Biphenyls	0.060	ug/L	180	0.01	-	<0.05	<0.060	<0.05	<0.060	<0.060	<0.05	<0.060	<0.05	<0.060	<0.05	<0.060	<0.05	<0.060

**Notes:**

<sup>1</sup> Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQSs) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).

<sup>2,3</sup> Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

Value

 Exceeds Fresh Water or Marine criteria reference below.

TABLE D5  
 HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2014) - VOCs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1									MW 93-1A										
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 12, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<	<
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1.00	16.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<	<4 (1)	<	<	<	<	<	<	<	<
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<
Vinyl Chloride	0.50	0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 SW = Surface Water Sample  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 0.0 = above criteria  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-A = Field Duplicate of MW 10-1A  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 DUP-07 = Field Duplicate of MW 10-1  
 (1) = Elevated RDL for analyzed VOC(s)

TABLE D5  
 HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2014) - VOCs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2									MW 93-2A								
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 12, 2017	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,2-Dichloropropane	1.00	16.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<4 (1)	<	<	<	<	<	<	
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<3 (1)	<	<	<	<	<	<	
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<10 (1)	<	<	<	<	<	<	
Vinyl Chloride	0.50	0.5	0.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 SW = Surface Water Sample  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 0.0 = above criteria  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-A = Field Duplicate of MW 10-1A  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 DUP-07 = Field Duplicate of MW 10-1  
 (1) = Elevated RDL for analyzed VOC(s)

TABLE D5  
 HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2014) - VOCs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 10-1											MW 10-1A								
			Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 DUP-07	Oct 12, 2017	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP- A	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<	<	<
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<	<	<
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<	<	<0.7 (1)	<	<0.7 (1)	<	<	<	<
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<	<	<
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<	<	<
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1.00	16.0	<	<	<	4.00	2.00	<	<	<	1.00	1.00	10	<	2.00	7.00	3.00	7.00	7.1	<	<	5.6
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	1.00	<	<	<	<	<	<	<	<	1.00	<	<	<	<	<	<	<
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<	<	<	<4 (1)	<	<4 (1)	<	<	<	<
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<	<	<
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	2.4	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<	<	<
Vinyl Chloride	0.50	0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 SW = Surface Water Sample  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 0.0 = above criteria  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-A = Field Duplicate of MW 10-1A  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 DUP-07 = Field Duplicate of MW 10-1  
 (1) = Elevated RDL for analyzed VOC(s)



TABLE D5  
 HISTORICAL GROUNDWATER ANALYTICAL (2021 - 2023) - VOCs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NJ

PARAMETER	RDL	UNITS	RBCA Human Health-Based Tier I EQS <sup>1</sup>	RBCA Ecological Tier I EQS		Sample ID & Date													
				Fresh Water <sup>2</sup>	Marine Water <sup>3</sup>	MW10-01		MW10-01A		MW10-01(DUP)	MW93-1		MW93-1A		MW93-2		MW93-2A		
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	
1,1,1-Trichloroethane	0.50	ug/L	64,000	7	420	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	.	<0.50	<1	<0.50	<1	<0.50	
1,1,1,2-Tetrachloroethane	0.50	ug/L	-	1,500	1,500	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	
1,1,2,2-Tetrachloroethane	0.50	ug/L	2600	260	260	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
1,1,2-Trichloroethane	0.50	ug/L	180	13	250	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
1,1-Dichloroethane	0.50	ug/L	13,000	100	-	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
1,1-Dichloroethylene	0.50	ug/L	630	700	-	<0.6	<0.50	<0.6	<0.50	<0.50	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50	
1,2-Dibromoethane	0.50	ug/L	-	-	-	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	
1,2-Dichlorobenzene	0.50	ug/L	910	8,000	-	<0.7	<0.50	<0.7	<0.50	<0.50	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50	
1,2-Dichloroethane	0.50	ug/L	6600	2,000	-	<2	<0.50	<2	<0.50	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	
1,2-Dichloropropane	0.50	ug/L	5600	400	-	<0.7	5.74	<0.7	<0.50	5.72	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50	
1,3-Dichlorobenzene	0.50	ug/L	130	1,000	1,000	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
1,4-Dichlorobenzene	0.50	ug/L	330	7	30,400	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
2-Hexanone	10.0	ug/L	-	-	-	<10.0	-	<10.0	-	-	<10.0	-	<10.0	-	<10.0	-	<10.0	-	
Acetone	10.0	ug/L	-	-	-	<10	-	<10	-	-	<10	-	<10	-	<10	-	<10	-	
Benzene	1.0	ug/L	-	-	-	<1	-	<1	-	-	<1	-	<1	-	<1	-	<1	-	
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	-	2,000	64,000	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Bromoform (Tribromomethane)	0.50	ug/L	84,000	600	64,000	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Bromomethane (Methyl bromide)	0.50	ug/L	33	9	64,000	<0.89	<0.50	<0.89	<0.50	<0.50	<0.89	<0.50	<0.89	<0.50	<0.89	<0.50	<0.89	<0.50	
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	6.9	133	130	<0.56	<0.20	<0.56	<0.20	<0.20	<0.56	<0.20	<0.56	<0.20	<0.56	<0.20	<0.56	<0.20	
Chlorobenzene	0.50	ug/L	-	11,000	-	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Chloroethane (Ethyl chloride)	0.50	ug/L	380	18	20	<5	<0.50	<5	<0.50	<0.50	<5	<0.50	<5	<0.50	<5	<0.50	<5	<0.50	
Chloroform (Trichloromethane)	2.00	ug/L	-	7,000	64,000	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Chloromethane (Methyl chloride)	0.50	ug/L	4600	2,000	-	<1	<2.0	<1	<2.0	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	
cis-1,2-Dichloroethylene	0.30	ug/L	-	-	-	<2	<0.50	<2	<0.50	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	
cis-1,3-Dichloropropylene	0.50	ug/L	10000	400	64,000	<0.5	<0.30	<0.5	<0.30	<0.30	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30	
Dibromochloromethane	0.20	ug/L	51	50	-	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Ethylbenzene	1.0	ug/L	-	-	-	<2	-	<2	-	-	<2	-	<2	-	<2	-	<2	-	
Ethylene Dibromide (1,2-Dibromoethane)	1.0	ug/L	43000	981	980	-	<0.20	-	<0.20	<0.20	-	<0.20	-	<0.20	-	<0.20	-	<0.20	
Methylene Chloride (Dichloromethane)	0.50	ug/L	26,000	720	-	<2	<1.0	<2	<1.0	<1.0	<2	<1.0	<2	<1.0	<2	<1.0	<2	<1.0	
o-Xylene	2.00	ug/L	-	-	-	<1	-	<1	-	-	<1	-	<1	-	<1	-	<1	-	
m,p-Xylene	1.0	ug/L	-	-	-	<4	-	<4	-	-	<4	-	<4	-	<4	-	<4	-	
Styrene	0.50	ug/L	660	1,100	1,100	<1	<0.50	<1	<0.50	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	4900	2,000	-	<2	<0.50	<2	<0.50	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	
Toluene	1.0	ug/L	-	-	-	<2	-	<2	-	-	<2	-	<2	-	<2	-	<2	-	
Total Xylenes	1.0	ug/L	-	-	-	<4	-	<4	-	-	<4	-	<4	-	<4	-	<4	-	
trans-1,2-Dichloroethylene	0.30	ug/L	-	-	-	<2	<0.50	<2	<0.50	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	<2	<0.50	
trans-1,3-Dichloropropylene	0.50	ug/L	110	210	200	<0.5	<0.30	<0.5	<0.30	<0.30	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30	
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	-	-	-	<1	1.35	<1	<0.50	1.30	<1	<0.50	<1	<0.50	<1	<0.50	<1	<0.50	
Trichlorofluoromethane (Freon 11)	0.50	ug/L	99	6,000	-	<5	<0.50	<5	<0.50	<0.50	<5	<0.50	<5	<0.50	<5	<0.50	<5	<0.50	
Vinyl Chloride	0.50	ug/L	200	6,000	-	<0.6	<0.50	<0.6	<0.50	<0.50	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50	

Notes:  
 1 Atlantic RBCA Human Health-Based Tier I Environmental Quality Standards (EQS) for soil based on commercial property with non-potable groundwater usage, coarse-grained soil (July 2021, updated July 2022).  
 2,3 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).  
 - = No applicable guideline or parameter not defined.

TABLE D6

HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2017) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 93-1									MW 93-1A										
				Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 17, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017
Anion Sum	me/L	N/A	-	6.10	7.22	5.87	5.52	7.47	6.51	6.2	6.2	6.4	-	7.22	7.33	7.46	5.61	6.5	6.47	7.23	7.66	6.6	7.19
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	236.0	292.0	229.0	210.0	304.0	270	240	250	250	-	285.0	293.0	297.0	216.0	260	250	300	320	270	310
Calculated TDS	mg/L	1.00	-	338.0	375.0	313.0	313.0	389.0	338	330	330	330	265.0	447.0	390.0	401.0	302.0	334	334	380	400	350	380
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	2.00	3.00	3.00	2.00	4.00	4.7	2.6	3.7	2.9	-	3.00	3.00	2.00	3.00	5.2	5.4	2.8	3.3	2.6	3.4
Cation Sum	me/L	N/A	-	6.60	6.77	5.62	5.90	6.90	6.14	5.82	5.72	5.62	-	9.57	7.02	7.19	5.35	5.89	5.94	7.05	7.38	-	7.09
Hardness (CaCO3)	mg/L	1.00	-	160	160	120	120	180	150	160	140	130	205	210	170	170	120	140	150	170	180	150	190
Ion Balance (% Difference)	%	N/A	-	4.00	3.22	2.18	3.33	3.97	2.92	3.16	4.11	6.33	-	14.00	2.16	1.84	2.37	4.92	4.27	1.26	1.86	1.07	0.7
Langelier Index (@ 20C)	N/A	N/A	-	0.50	0.62	0.47	0.38	0.80	0.815	0.51	0.64	0.537	-	0.70	0.62	0.61	0.55	0.826	0.846	0.65	0.74	0.56	0.792
Langelier Index (@ 4C)	N/A	N/A	-	0.30	0.37	0.22	0.13	0.55	0.566	0.261	0.395	0.288	-	0.45	0.37	0.36	0.31	0.577	0.597	0.401	0.495	0.312	0.544
Nitrate (N)	mg/L	0.05	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Saturation pH (@ 20C)	N/A	N/A	-	7.50	7.41	7.64	7.64	7.32	7.45	7.54	7.56	7.54	-	7.31	7.37	7.32	7.67	7.5	7.5	7.34	7.29	7.45	7.28
Saturation pH (@ 4C)	N/A	N/A	-	7.80	7.66	7.89	7.89	7.57	7.69	7.79	7.81	7.79	-	7.55	7.62	7.57	7.92	7.75	7.75	7.59	7.54	7.69	7.53
Total Alkalinity (Total as CaCO3)	mg/L	30	-	240	300	230	210	310	280	250	250	260	290	290	300	300	220	260	260	310	320	280	310
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<	<
Dissolved Chloride (Cl)	mg/L	1	-	36	35	19	15	11	11	24	17	30	11	12	11	11	16	30	30	11	10	11	11
Colour	TCU	5.00	-	<	<	<	<	<	<	<	<	<	-	<	<	<5	<5	<	<	<	<	<	<
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrite (N)	mg/L	0.01	-	<	<	<	<	<	<	<	<	<	0.015	<	<	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	0.10	<	<	<	<	<	<	<	<	0.02	<	<	<0.05	<0.05	<	<	<	<	<	<
Total Organic Carbon (C)	mg/L	0.50	-	1.20	1.00	2.10	0.90	930.00	<	1.1	0.86	<	2.00	<	<(5) ( 1 )	<(5) ( 1 )	<(0.5)	1.4	1.5	2.6 ( 1 )	<	1.68	<5.0
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	<	0.013	<	5.3	-	<	<	0.04	<	<	<	<	<	0.011	<
pH	pH	N/A	-	8.00	8.03	8.11	8.02	8.12	8.26	8.05	8.2	8.08	8.02	8.00	7.99	7.93	8.22	8.33	8.35	7.99	8.03	8.01	8.07
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.50	-	9.90	10.00	7.60	7.60	6.90	5.3	8.1	7.9	9.1	-	5.00	7.10	6.80	7.70	9.1	9.1	6.3	7.7	4.4	5.9
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	2	16	33	42	48	33	27	37	19	-	55	53	56	38	19	20	38	43	35	30
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	0.5	1.3	61.0	34.0	<1000	590	2.1	5.1	47	-	350.0	300.0	470.0	1.1	5.9	5.7	160	490	>1000	690
Conductivity	uS/cm	1	-	580	580	520	500	630	580	540	520	570	511	610	630	640	500	580	590	620	680	580	640
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 0.0 = above criteria  
 - = Not analysed/No criteria  
 (2) = Reporting limit was increased due to turbidity  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 Dup-07 = Field Duplicate of MW 10-1  
 (1) = Elevated detection limit due to matrix interference

TABLE D6  
 HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2017) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 93-2									MW 93-2A								
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 17, 2017	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017
Anion Sum	me/L	N/A	-	-	6.90	6.30	6.58	6.42	6.36	6.33	6.18	5.79	2.69	6.43	1.31	2.42	1.37	1.72	2.27	2.22	1.88
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	-	232.0	205.0	219.0	210.0	210.0	220	220	220	62.0	212.0	14.0	61.0	11.0	14	7.7	14	17
Calculated TDS	mg/L	1.00	-	331.0	380.0	346.0	368.0	361.0	353.0	350	340	320	184.0	351.0	87.0	145.0	96.0	120	150	150	130
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	-	1.00	1.00	1.00	2.00	2.60	1.3	1.7	<	<	1.00	<	<	<	<	<	<	<
Cation Sum	me/L	N/A	-	-	6.50	5.66	6.19	6.10	5.99	5.97	6.01	5.61	3.43	5.70	1.15	2.09	1.44	1.87	1.96	2.31	1.88
Hardness (CaCO3)	mg/L	1.00	-	245	270	240	250	260	250	250	250	230	120	240	31	73	34	42	61	60	43
Ion Balance (% Difference)	%	N/A	-	-	2.60	5.35	3.05	2.56	3.00	2.93	1.39	1.58	12.10		6.50	7.32	2.49	4.18	7.33	1.99	0
Langelier Index (@ 20C)	N/A	N/A	-	-	0.50	0.53	0.54	0.68	0.90	0.591	0.711	0.368	-1.51	0.48	-3.48	-1.21	-3.03	-3.37	-3.6	-2.85	-3.09
Langelier Index (@ 4C)	N/A	N/A	-	-	0.30	0.28	0.29	0.43	0.65	0.342	0.462	0.119	-1.76	0.24	-3.73	-1.46	-3.28	-3.62	-3.85	-3.1	-3.34
Nitrate (N)	mg/L	0.05	-	-	<	<	<	<	<	<	<	<	<	<	0.15	<	<	<	0.43	<	<
Saturation pH (@ 20C)	N/A	N/A	-	-	7.20	7.28	7.20	7.23	7.22	7.22	7.2	7.24	8.06	7.27	9.25	8.27	9.28	9.14	9.26	9.02	9.08
Saturation pH (@ 4C)	N/A	N/A	-	-	7.40	7.53	7.45	7.47	7.47	7.47	7.45	7.49	8.31	7.52	9.50	8.52	9.53	9.39	9.51	9.28	9.33
Total Alkalinity (Total as CaCO3)	mg/L	30	-	205	2,320	210	220	210	220	220	220	220	62	210	14	61	12	14	7.7	14	17
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	24	24	23	21	20	20	19	18	16	21	23	14	16	17	22	31	31	28
Colour	TCU	5.00	-	-	<	<	<5	<5	<	<	<	<	6.00	<	79.00	120.00	41.00	65	14	36	<
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<	<
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.43	<	<
Nitrite (N)	mg/L	0.01	-	0.02	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	<0.01	<	<	<	<	<	<	<	<	0.24	<	0.35	0.25	0.40	0.53	0.21	0.36	0.35
Total Organic Carbon (C)	mg/L	0.50	-	2	0.5	1.5	1.3	1	0.88	1	0.81	1.3	6.20	1.30	16.00	17.00	22.00	16	13	10.7	11
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.012	<
pH	pH	N/A	-	7.50	7.70	7.81	7.74	7.90	8.12	7.81	7.91	7.61	6.55	7.75	5.77	7.06	6.25	5.77	5.66	5.48	5.99
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.50	-	-	19.00	18.00	19.00	19.00	18.00	18	17	18	12.00	18.00	6.40	11.00	5.70	6.4	7	8	7.3
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	-	73	74	76	78	71	68	56	46	41	74	31	36	32	40	58	51	36
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	-	13.0	5.4	13.0	3.9	4.0	1.1	6.1	1.7	84.0	3.2	100.0	190.0	120.0	44	70	160	40
Conductivity	uS/cm	1	-	549	560	570	580	570	580	560	550	530	260	570	140	230	150	190	260	250	220
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 0.0 = above criteria  
 - = Not analysed/No criteria  
 (2) = Reporting limit was increased due to turbidity  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 Dup-07 = Field Duplicate of MW 10-1  
 (1) = Elevated detection limit due to matrix interference

TABLE D6

HISTORICAL GROUNDWATER ANALYTICAL (2008 - 2017) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 10-1											MW 10-1A									
				Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 Dup-07	Oct 17, 2017	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017	
Anion Sum	me/L	N/A	-	3.87	2.63	3.89	2.70	3.48	3.24	2.92	2.96	3.11	3.16	2.3	3.86	3.08	1.43	2.11	1.44	1.66	2.92	2.2	1.79	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	94.0	92.0	96.0	95.0	144.0	140	120	120	96	98	92	94.0	114.0	50.0	77.0	51.0	49	90	71	67	
Calculated TDS	mg/L	1.00	-	215.0	147.0	217.0	149.0	185.0	174	160	160	170	170	130	215.0	171.0	95.0	122.0	95.0	100	160	130	110	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	<	<	<	<	<	1.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Cation Sum	me/L	N/A	-	3.60	2.55	3.66	2.57	3.27	3.11	2.89	2.91	2.99	3.01	2.13	3.61	3.08	1.57	1.98	1.59	1.61	2.76	2.05	1.68	
Hardness (CaCO3)	mg/L	1.00	-	100	110	100	110	150	140	130	130	130	130	90	100	140	61	84	61	68	120	85	65	
Ion Balance (% Difference)	%	N/A	-	3.61	1.54	3.05	2.47	3.11	2.05	0.52	0.85	1.97	2.43	3.84	3.35	0.00	4.67	3.18	4.95	1.53	2.82	3.53	3.17	
Langelier Index (@ 20C)	N/A	N/A	-	-0.23	-0.79	-0.31	-0.68	0.34	0.365	-0.202	-0.192	-0.006	0.007	-0.424	-0.36	-0.18	-1.18	-0.60	-1.11	-1.51	-0.083	-0.799	-0.898	
Langelier Index (@ 4C)	N/A	N/A	-	-0.48	-1.05	-0.56	-0.93	0.09	0.115	-0.452	-0.442	-0.256	-0.243	-0.675	-0.61	-0.43	-1.43	-0.85	-1.36	-1.76	-0.333	-1.05	-1.15	
Nitrate (N)	mg/L	0.05	-	<	0.24	<	0.25	<	0.16	<	<	0.13	0.14	<	<	0.26	0.10	0.08	0.08	0.068	0.069	0.11	0.064	
Saturation pH (@ 20C)	N/A	N/A	-	7.93	7.79	7.91	7.77	7.51	7.55	7.64	7.63	7.73	7.72	7.91	7.92	7.64	8.32	8.00	8.31	8.29	7.76	8.05	8.19	
Saturation pH (@ 4C)	N/A	N/A	-	8.18	8.05	8.16	8.02	7.76	7.8	7.89	7.88	7.98	7.97	8.16	8.17	7.89	8.57	8.25	8.56	8.54	8.01	8.3	8.44	
Total Alkalinity (Total as CaCO3)	mg/L	30	-	95	92	96	96	140	140	120	120	96	98	93	95	110	51	77	51	49	90	71	67	
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Chloride (Cl)	mg/L	1	-	56	12	56	12	6	3.8	5.4	5.8	26	26	5.3	56	14	3	4	3	5.7	27	11	4.9	
Colour	TCU	5.00	-	10.00	9.00	6.00	13.00	9.00	5.6	<	<	<	<	7.2	7.00	5.00	22.00	7.70	18.00	8.2	16	8.1	10	
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	0.90	0.16	<	<	0.13	0.14	<	<	<	0.11	0.08	0.08	0.068	0.069	0.11	0.064	
Nitrite (N)	mg/L	0.01	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	0.14	<0.05	0.14	<0.05	0.28	<	<	<	<	<	<0.050	0.15	0.09	<	0.11	<	<	<	<	0.16	
Total Organic Carbon (C)	mg/L	0.50	-	8 <sup>(1)</sup>	33.00	8 <sup>(1)</sup>	18.00	18.00	2.7	3	3.1	2.2	2.3	4.2	8 <sup>(1)</sup>	2.30	15.00	8.70	18.00	34 (1)	7.1 (2)	0.11	<50	
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.012	<	
pH	pH	N/A	-	7.70	7.00	7.60	7.09	7.85	7.91	7.44	7.44	7.73	7.72	7.48	7.56	7.46	7.14	7.40	7.20	6.78	7.68	7.25	7.29	
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Reactive Silica (SiO2)	mg/L	0.50	-	7.00	6.20	7.00	6.00	8.00	7.4	6.9	7	4.5	4.5	11.0	7.10	7.60	10.00	10.00	10.00	11	2.9	10	11	
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	9,400	-	-	-	-	
Dissolved Sulphate (SO4)	mg/L	2	-	18	21	19	21	20	17	17	18	21	21	14	19	19	22	21	22	24	16	22	14	
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Turbidity	NTU	0.1	-	640.0	>1000	570.0	540.0	320.0	26	110	110	37	38	38	520.0	110.0	>1000	240.0	>1000	>1000	>1000	>1000	800	
Conductivity	uS/cm	1	-	380	250	380	260	320	300	270	280	300	300	230	380	300	150	200	150	160	280	200	160	
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Notes:  
 Analysis completed by Maxxam Analytics Inc. Laboratory in St. John's, NL.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 0.0 = above criteria  
 - = Not analysed/No criteria  
 (2) = Reporting limit was increased due to turbidity  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 Dup-07 = Field Duplicate of MW 10-1  
 (1) = Elevated detection limit due to matrix interference

TABLE D6  
 HISTORICAL GROUNDWATER ANALYTICAL (2021 - 2023) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date												
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	MW10-01		MW10-01A		MW10-01(DUP)	MW93-1		MW93-1A		MW93-2		MW93-2A	
					8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23
pH	0.1	-	6.5 - 9	7.0 - 8.7	7.49	7.11	7.76	7.39	7.22	8.37	8.22	8.32	8.05	8.01	5.13	7.34	8.04
Reactive Silica as SiO2	500	ug/L	-	-	6.3	-	1.5	-	-	3.5	-	5.0	-	13.4	-	16.6	-
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCl)	6	9,970	29	7,850	9,560	10	12,400	10	9,790	16	26,900	20	20,500
Fluoride	20	ug/L	120	1500	<0.12	26	<0.12	42	25	0	228	0	107	<0.12	72	<0.12	42
Sulphate	300	ug/L	128,000	-	13	11,600	6	4,410	11,500	25	37,000	37	45,700	40	57,500	32	36,700
Alkalinity	1000	ug/L	-	-	48	60,600	67	76,700	61,600	294	202,000	195	298,000	188	1,900	77	178,000
True Color	2	TCU	-	-	30.7	2150	73	1810	1830	<5.00	17.7	5	111	<5.00	1960	25	26.0
Turbidity	0.1	NTU	-	-	8.1	345	1	303	267	1	5.14	<0.5	45.4	5	175	103	10.3
Electrical Conductivity	1	uS/cm	-	-	150	178	264	172	176	637	488	497	668	511	242	300	473
Nitrate + Nitrite as N	3.2	ug/L	-	-	<0.05	44	0	123	37	<0.05	22	<0.05	<22.4	<0.05	293	<0.05	25
Nitrate as N	20	ug/L	13,000	200,000	<0.05	44	0	123	37	<0.05	<20	<0.05	<20	<0.05	293	<0.05	25
Nitrite as N	10	ug/L	60	-	<0.05	<10	<0.05	<10	<10	<0.05	<10	<0.05	<10	<0.05	<10	<0.05	<10
Ammonia as N	5	ug/L	7.11 (MW10-01 and MW10-01(DUP)); 7.32 (MW10-01A); 2.33 (MW93-1 and MW93-1A); 231 (MW93-2 and MW93-2A)	18,500 (MW10-01, MW10-01A, MW10-01(DUP)); 3,700 (MW93-1, MW93-1A and MW93-2A); 18,400 (MW93-2)	0.06	165	0.04	13.9	45.2	0.03	9.8	0.2	10.7	<0.03	139	0.19	7.1
Ortho-Phosphates as P	1	ug/L	-	-	<0.01	<1.0	<0.01	<1.0	<1.0	<0.01	<1.0	<0.01	<1.0	0	<1.0	0	1.3
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	48	73,900	67	93,600	75,200	286	247,000	192	363,000	188	2,300	77	217,000
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	<10	<1000	<10	<1000	<1000	<10	<1000	<10	<1000	<10	<1000	<10	<1000
Hydroxide	1000	ug/L	-	-	<5	<1000	<5	<1000	<1000	<5	<1000	<5	<1000	<5	<1000	<5	<1000
Calculated TDS	10	ug/L	-	-	82	129,000	125	144,000	127,000	351	290,000	269	392,000	261	188,000	147	304,000
Hardness	50	ug/L	-	-	56.7	-	106	-	-	173	-	115	-	198	-	85	-
Total Organic Carbon	500	ug/L	-	-	5.2	-	5	-	-	1	-	1	-	1	-	12	-
Langelier Index (@20C)	0.01	NA	-	-	-1.15	-1.15	0	-0.746	-1.00	1	0.484	0	0.691	0	-4.84	-1	0.597
Langelier Index (@4C)	0.01	NA	-	-	-1.47	-1.40	-1	-0.998	-1.25	0	0.237	0	0.444	0	-5.10	-1	0.350
Saturation pH (@20C)	0.01	NA	-	-	8.64	8.26	8.2	8.14	8.22	8	7.74	8	7.36	8	9.98	8	7.44
Saturation pH (@4C)	0.01	NA	-	-	8.96	8.51	9	8.39	8.47	8	7.98	8	7.60	8	10.2	9	7.69
Anion Sum	0.1	me/L	-	-	1.4	1.74	2	1.86	1.74	7	5.17	5	7.19	5	2.02	3	4.90
Cation Sum	0.1	me/L	-	-	1.66	1.72	2	1.73	1.72	7	5.17	5	7.28	5	2.07	3	4.67
% Difference / Ion Balance	0.01	%	-	-	8.6	98.8	3.6	93.0	98.8	1.8	100	2.3	101	2	102	5.2	95.3

Notes:

1, 2 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

Value <sup>A</sup> Exceeds Fresh Water or Marine criteria reference below.

TABLE D7  
 HISTORICAL GROUNDWATER ANALYTICAL (2028 - 2017) - METALS  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1										MW 93-1A										MW 93-2									
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 17, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Oct 17, 2017	
Aluminum (Al)	5.0	-	100	120	37	17	73.7	73.7	8.3	14	9.5	42000	13,000	15	31	5.9	5.9	13.0	10	18	33	9.8	484	460	9	<	<	<	<	5.4	6.2	7.8
Antimony (Sb)	1.0	20,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	
Arsenic (As)	1.0	1,900	<	<	<	<	<	<	<	1.2	<	36	7	<	<	<	<	<	<	<	ND	<	3	2	2	2	1.2	1.9	3.0	2.3		
Barium (Ba)	1.0	29,000	130	150	88	70	77.9	77.9	100	85	100	426	240	79	73	68.6	68.6	107	83	71	74	71	131	180	170	160	171	171	170	190	150	
Beryllium (Be)	1.0	67	<	<	<	<	<	<	<	<	<	2	<	<	<	<	<	<	<	<	ND	<	<0.1	<	<	<	<	<	<	<	<	
Bismuth (Bi)	2.0	-	<	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	ND	<	<0.5	<	<	<	<	<	<	<	<	
Boron (B)	5.0	45,000	120	120	100	99	63	63	110	98	120	-	58	56	57	96	96	118	69	64	59	79	-	1100	980	1100	<	<	1,100	980	1000	
Cadmium (Cd)	0.0	2.7	0.4	<	0.02	0.05	<	<	0.044	0.022	<	3	<	0.03	0.07	<	<	<	<	0.012	ND	0.013	-	<	0.15	0.1	1160	1160	<0.010	<	<	
Calcium (Ca)	100	-	-	26,000	29,000	43,500	43,500	31,000	30,000	30,000	-	-	40,000	45,000	26,300	26,300	33,000	42,000	45,000	35,000	47,000	-	-	69,000	80,000	77,300	77,400	75,000	76,000	70,000		
Chromium (Cr)	1.0	810/140 <sup>(1)</sup>	<	<	<	<	<	<	<	<	<	54	39	<	<	<	<	<	<	<	ND	<	1	<	<	<	<	<	<	<	<	
Cobalt (Co)	0.4	66	<	<	<	<	0.44	0.44	<	<	<	110	170	0.7	0.4	<	<	<	<	1	<	3	1	1	<	0.4	<	<	<	<	0.4	
Copper (Cu)	2.0	87	6	3	<	<	<	<	<	<	<	370	170	2	<	<	<	6.8	<	<	ND	3	8	5	<	0.56	0.56	<	<	<	<	
Iron (Fe)	50	-	670	550	<	<	65	65	570	330	<	-	37000	<	<	<	<	55	530	<	ND	110	1300	980	<	<	<	57	130	120		
Lead (Pb)	1	25	4.6	1	<	<	<	<	<	<	<	45	17	<	<	<	<	<	<	<	ND	<	5	2	<	<	<	<	<	<	<	
Magnesium (Mg)	100	-	-	14,000	12,000	16,400	16,400	15,000	14,000	14,000	-	-	17,000	14,000	12,200	12,200	15,400	17,000	17,000	16,000	17,000	-	-	16,000	13,000	15,600	15,600	15,000	15,000	14,000		
Manganese (Mn)	2.0	-	110	120	81	60	60	110	120	87	2,620	1200	160	57	259	259	103	160	71	68	140	15,300	1200	880	950	1,120	1,120	980	720	1000		
Molybdenum (Mo)	2.0	9,200	6	6	20	18	16.3	16.3	15	15	15	20	11	15	14	19.2	19.2	10.7	16	15	18	2	2	<	<	<	<	<	<	<	<	
Nickel (Ni)	2.0	490	6	<	<	<	<	<	<	<	<	154	87	<	<	<	<	<	<	<	3.1	2	1	<	<	<	<	<	<	<	<	
Phosphorus (P)	100	-	-	<	<	-	-	<	<	<	<	-	-	<	130	-	-	<	<	<	ND	<	-	-	<	150	-	-	<	<	<	
Potassium (K)	100	-	-	1900	2000	2680	2680	1800	1700	1600	-	-	2500	2700	1830	1830	1730	2700	2500	2400	2500	-	-	1200	1400	1560	1560	1300	1300	1300		
Selenium (Se)	1.0	63	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<	1	<	<	<	<	<	<	<	<	
Silver (Ag)	0.1	1.5	<	<	<	<	<	<	<	<	<	1	<	<	<	<	<	<	<	<	ND	<	-	<	<	<	<	<	<	<	<	
Sodium	100	2,300,000	-	-	-	76,100	70,400	69,000	69,000	68,000	-	-	-	68,600	68,200	68,600	80,000	85,000	77,000	75,000	-	-	-	-	-	21,000	20,300	22,000	22,000	22,000		
Strontium (Sr)	2.0	-	250	260	230	220	263	263	240	220	230	-	300	300	280	192	192	249	280	280	230	290	-	230	240	230	210	210	220	230	200	
Thallium (Tl)	0.1	510	<	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	ND	<	-	<	<	<	<	<	<	<	<	<
Tin (Sn)	2.0	-	<	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	ND	<	-	<	<	<	<	<	<	<	<	<
Titanium (Ti)	2.0	-	3	3	<	<	2.6	2.6	<	<	<	-	720	<	<	<	<	<	<	<	ND	<	-	21	<	<	<	<	<	<	<	<
Uranium (U)	0.1	-	0.2	0.2	0.3	0.2	3.06	3.06	0.16	0.34	0.28	-	6	2.9	2.8	0.4	0.4	0.21	2.3	3.1	5	2.4	-	0	0.3	0.2	0.24	0.24	0.26	0.23	0.20	
Vanadium (V)	2.0	250	<	<	<	<	<	<	<	<	<	155	28	<	<	<	<	<	<	<	ND	<	2	<	<	<	<	<	<	<	<	<
Zinc (Zn)	5.0	1,100	360	32	10	10	<	<	12	10	<	443	250	<	<	<	<	<	<	<	ND	10	33	41	19	18	5	5	<	<	5.6	

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition  
 RDL = Reportable Detection Limit  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 <(R) = Parameter below AMEC laboratory detection limit  
 <(R) = above criteria  
 DUP-01 = Field Duplicate of MW 10-1, First Sampling Event  
 DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event  
 DUP-03 = Field Duplicate of MW 93-1A  
 DUP-05 = Field Duplicate of MW 10-1  
 DUP-07 = Field Duplicate for MW 10-1  
 (1) Criteria for Total Chromium = 2000 ug/L, Criteria for Chromium (VI) = 110 ug/L

TABLE D7  
 HISTORICAL GROUNDWATER ANALYTICAL (2028 - 2017) - METALS  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2A										MW 10-1										MW 10-1A										
			Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017	Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 DUP-07	Oct 17, 2017	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 17, 2017		
Aluminum (Al)	5.0	-	630	<	150	86.6		290	270	170	220	200	86.6	38	160	36	41.8	41.8	30	26	17	8.5	100	11	74.5	74.5	68.3	58	75	32	17		
Antimony (Sb)	1.0	20,000	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<		
Arsenic (As)	1.0	1,900	<	2	<	<	<	<	<	ND	1.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<		
Barium (Ba)	1.0	29,000	69	180	39	54.1	54.1	48	90	54	49	100	36	110	38	50.2	50.2	38	38	41	41	37	110	62	28.8	28.8	29.4	35	22	39	40		
Beryllium (Be)	1.0	67	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<		
Bismuth (Bi)	2.0	-	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<		
Boron (B)	5.0	45,000	440.0	1000	24	317	317	<	<	110	95	45	9	38	9	<	<	<	<	<	<	<	42	13	<	<	<	<	<	<	ND	<	
Cadmium (Cd)	0.0	2.7	11	0.15	3.5	0.304	0.304	0.32	11	0.8	0.31	0.03	<	0.03	<	0.032	0.032	0.037	0.053	<	<	0.027	0.02	0.03	0.039	0.039	0.036	0.033	<	0.03	0.015		
Calcium (Ca)	100	-	<	69,000	9,000	20,600	20,600	11,000	16,000	15,000	11,000	31,000	41,000	32,000	42,000	51,100	51,100	45,000	45,000	46,000	47,000	30,000	31,000	48,000	20,600	20,600	20,800	23,000	45,000	28,000	21,000		
Chromium (Cr)	1.0	810/140 <sup>(1)</sup>	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<	
Cobalt (Co)	0.4	66	1	<	1.4	1.19	1.19	0.93	5.2	2.9	2.2	2.3	1.4	2.4	1.4	4.91	4.91	0.41	<	<	<	3.3	2.5	3.3	1.54	1.54	2.07	12	<	6.3	5		
Copper (Cu)	2.0	87	6	<	<	<	<	<	<	ND	<	5	9	5	9	7.3	7.3	5.8	6	3.8	4	4	4	4	9.4	9.4	11	6.8	5.8	5.3			
Iron (Fe)	50	-	9900	<	1900	3000	3000	12,000	730	7,700	8,600	120	50	140	59	50	50	84	<	<	<	1000	82	<	96	96	560	86	1100	3600			
Lead (Pb)	1	25	6.9	<	0.8	1.17	1.17	1	1	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	2.66	<	<	ND	<	
Magnesium (Mg)	100	-	<	16,000	2,200	5,220	5,220	3,300	4,900	5,200	3,600	5,800	2,300	5,900	2,300	4,540	4,540	4,100	4,000	3,900	3,900	3,500	5,900	3,900	2,190	2,190	2,150	2,500	1,800	3,300	2,700		
Manganese (Mn)	2.0	-	4300	890	4,000	4,190	4,190	5,000	6,700	5,700	5,100	390	190	390	170	239	239	5,100	27	26	12	13	310	400	380	106	106	139	860	3.3	590	530	
Molybdenum (Mo)	2.0	9,200	<	<	<	<	<	<	<	ND	<	16	3	16	3	2.5	2.5	<	<	<	<	14	5	5	8.5	8.5	6.1	3.2	<	ND	<		
Nickel (Ni)	2.0	490	<	<	<	<	<	<	4.8	2.6	2.3	6	6	6	6	6.5	6.5	2	2.1	<	<	4	5	6	8.9	8.9	8.3	11	<	6.4	5.5		
Phosphorus (P)	100	-	<	<	<	<	<	<	110	ND	<	<	150	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<	
Potassium (K)	100	-	<	1200	980	1040	1040	1300	1600	1500	1300	6400	1100	6400	980	1360	1360	1200	1300	1100	1100	810	6400	1400	714	714	693	720	850	710	620		
Selenium (Se)	1.0	63	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<
Silver (Ag)	0.1	1.5	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.15	<	<	<	<	
Sodium	100	2,300,000	-	-	-	11,000	9,100	12,000	15,000	18,000	15,000	-	-	-	6,570	7,020	6,600	6,600	8,000	7,800	6,100	-	-	4,670	5,750	4,600	5,100	8,100	6,600	5,300			
Strontium (Sr)	2.0	-	100	240	41	70.6	70.6	52	77	68	55	98	85	99	87	106	106	98	98	98	98	68	99	100	46.9	46.9	45.4	56	85	68	53		
Thallium (Tl)	0.1	510	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<
Tin (Sn)	2.0	-	<	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<
Titanium (Ti)	2.0	-	20	<	2	<	<	2.2	<	ND	<	3	<	3	<	<	<	<	<	<	<	2	<	2.1	2.1	<	<	<	<	3.9	ND	<	
Uranium (U)	0.1	-	0.3	0.3	<	<	<	<	<	ND	<	0.4	<	0.4	<	0.43	0.43	0.29	0.29	0.2	0.21	0.1	0.4	0.3	<	<	<	<	0.14	ND	<		
Vanadium (V)	2.0	250	4	<	<	<	<	<	<	ND	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	ND	<	
Zinc (Zn)	5.0	1,100	1,700	17	1,300	568	568	190	2,900	290	130	5	11	6	11	9	9	8.2	11	<	<	13	5	10	8.9	8.9	10.1	6.9	<	8.4	7.3		

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(R) = Parameter below AMEC laboratory detection limit

8.8 = above criteria

DUP-01 = Field Duplicate of MW 10-1, First Sampling Event

DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event

DUP-03 = Field Duplicate of MW 93-1A

DUP-05 = Field Duplicate of MW 10-1

DUP-07 = Field Duplicate of MW 10-1

(1) Criteria for Total Chromium = 2000 ug/L, Criteria for Chromium (VI) = 110 ug/L

TABLE D7

HISTORICAL GROUNDWATER ANALYTICAL (2021 - 2023) - METALS  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date												
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	MW10-01		MW10-01A		MW10-01(DUP)	MW93-1		MW93-1A		MW93-2		MW93-2A	
					8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	21-Dec-22	8-Dec-21	4-Jan-23	8-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23	14-Dec-21	4-Jan-23
Aluminum	1	ug/L	50	-	2.95	49.6	2.84	11.2	15.4	1.7	4.1	1.58	1.9	2.1	473	1.4	11.90
Antimony	0.1	ug/L	90	2,500	8	0.11	25.50	0.22	0.22	8.60	<0.10	9.0000	<0.10	13.9	<0.10	30.2	0.27
Arsenic	0.1	ug/L	50	125	<1.0	0.96	<1.0	0.34	0.36	<1.0	0.91	<1.0	<0.10	<1.0	0.19	<1.0	2.31
Barium	0.1	ug/L	10,000	5,000	2	26.4	<1.0	29.6	31.0	<1.0	55.4	1.3	81.8	3.2	97.2	<1.0	14.7
Beryllium	0.02	ug/L	1.5	1,000	39	0.024	25.4	<0.020	<0.020	70	<0.020	57.00	<0.020	119	1.25	47.7	<0.020
Bismuth	0.05	ug/L	-	-	<0.50	<0.050	<0.50	<0.050	<0.050	<0.50	<0.050	<0.50	<0.050	<0.50	<0.050	<0.50	<0.050
Boron	10	ug/L	15,000	12,000	<2.0	<10	<2.0	<10	<10	<2.0	83	<2.0	65	<2.0	12	<2.0	535
Cadmium	0.005	ug/L	0.9	1.2	15.5	0.0061	<10.0	0.0168	0.0184	77.7	<0.0050	101	<0.0050	711	5.99	341	0.0150
Calcium	50	ug/L	-	-	<0.10	20,700	<0.10	22,100	22,200	<0.10	24,200.00	<0.10	41,400.00	<0.10	11,100.00	0.49	54,200.00
Cesium	0.01	ug/L	-	-	18100	0.078	39,400.000	0.050	0.050	41,100.000	0.063	26,300.000	0.015	59,100.000	0.025	23,500.000	0.076
Chromium (total)	0.5	ug/L	89	560	-	<0.50	-	<0.50	<0.50	-	<0.50	-	<0.50	-	<0.50	-	<0.50
Cobalt	0.1	ug/L	10	40	<2.0	1.44	<2.0	2.48	2.53	<2.0	<0.10	<2.0	<0.10	<2.0	4.06	<2.0	<0.10
Copper	0.2	ug/L	20	10	7.86	3.51	<0.50	4.01	3.92	<0.50	1.11	<0.50	0.42	<0.50	2.38	1.71	0.70
Iron	10	ug/L	3,000	-	1.8	7,240	5.4	670	480	<1.0	<10	<1.0	<10	<1.0	789	<1.0	30
Lead	0.05	ug/L	10	20	7,150	0.170	61.000	0.065	0.059	<10	<0.050	<10	<0.050	<10	0.988	73.000	<0.050
Lithium	1	ug/L	-	-	<0.50	<1	<0.50	<1	<1	<0.50	8.2	<0.50	16.3	<0.50	4.2	<0.50	7.5
Magnesium	5	ug/L	-	-	-	1,270	-	4,180	3,920	-	12,300	-	19,000	-	4,830	-	12,400
Manganese	0.1	ug/L	4,300	-	2,800	240	1,780	560	623	17,100	2.82	11,900	1.57	12,200	5,810	6,310	46.8
Molybdenum	0	ug/L	0.26	0.16	836	2.16	33.3	2.51	2.6	65.4	18.3	55.7	12.9	673	0.052	3660	0.251
Nickel	0.05	ug/L	730	10,000	<2.0	1.59	<2.0	3.07	3.07	20.20	<0.50	18	0.60	<2.0	6.08	<2.0	<0.50
Phosphorus	0.5	ug/L	250	83	5.7	<50	<1.0	<50	<50	1	<50	<1.0	<50	<1.0	<50	2	<50
Potassium	50	ug/L	-	-	<0.05	634	<0.05	834	792	<0.05	1,600	<0.05	2,420	<0.05	1,080	<0.05	1,210
Rubidium	50	ug/L	-	-	<2,500	0.76	<2,500	0.77	0.71	2,750.00	0.85	<2,500	0.86	<2,500	2.02	<2,500	0.84
Selenium	0.2	ug/L	-	-	-	0.216	-	0.112	0.084	-	<0.050	-	<0.050	-	<0.050	-	<0.050
Silicon (as SiO <sub>2</sub> )	0.05	ug/L	10	20	<1.0	2,740	<1.0	11,200	11,200	<1.0	7,760	<1.0	7,680	<1.0	6,950	<1.0	17,400
Silicon	50	ug/L	-	-	-	1,280	-	5,250	5,250	-	3,630	-	3,590	-	3,250	-	8,120
Silver	0.01	ug/L	2.5	15	-	0.032	-	0.014	0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010
Sodium	50	ug/L	-	-	<0.10	6,580	<0.10	5,450	5,600	<0.10	66,900	<0.10	82	<0.10	17,100	<0.10	21,000
Strontium	0.2	ug/L	210,000	-	5,440	49.8	7,760	58.8	60.5	78,200	200	66,300	302	19,800	68.3	14,600	203
Sulfur	500	ug/L	-	-	47	1,340	77	3,900	3,880	281	13,400	194	16,400	163	19,500	73	13,800
Tellurium	0.2	ug/L	-	-	-	<0.20	-	<0.20	<0.20	-	<0.20	-	<0.20	-	<0.20	-	<0.20
Thallium	0.01	ug/L	8	3	-	<0.010	-	<0.010	<0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010
Thorium	0.1	ug/L	-	-	<0.30	<0.10	<0.30	<0.10	<0.10	<0.30	<0.10	<0.30	<0.10	<0.30	<0.10	<0.30	<0.10
Tin	0.1	ug/L	-	-	-	<0.10	-	0.18	0.13	-	<0.10	-	<0.10	-	<0.10	-	0.50
Titanium	0.3	ug/L	-	-	<2.0	1.77	<2.0	<0.30	<0.30	<2.0	<0.30	<2.0	<0.30	<2.0	0.37	<2.0	<0.30
Tungsten	0.1	ug/L	-	-	<2.0	1.79	<2.0	0.56	0.53	<2.0	13.7	<2.0	10.1	4.3	<0.10	2	<0.10
Uranium	0.01	ug/L	150	85	-	0.286	-	0.077	0.076	-	0.430	-	2.98	-	0.021	-	0.151
Vanadium	0.05	ug/L	1,200	50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Zinc	1	ug/L	70	100	<2.0	2.3	<2.0	3.8	4.7	<2.0	2.0	<2.0	1.4	<2.0	1,180	<2.0	28.2
Zirconium	0.3	ug/L	-	-	14.4	0.65	<5.0	<0.20	<0.20	<5.0	<0.20	<5.0	<0.20	5.7	<0.20	583	<0.20

Notes:

1, 2 Atlantic RBCA Ecological Tier I EQSs for groundwater based on >10m from a surface water body with discharge to a fresh water and/or marine water (July 2021, updated July 2022)..

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

Value Exceeds Fresh Water or Marine criteria reference below.



TABLE D8

HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - BTEX/MTPH  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl- benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C <sub>6</sub> -C <sub>10</sub>	F2 C <sub>10</sub> -C <sub>16</sub>	F3 C <sub>16</sub> -C <sub>21</sub>	C <sub>21</sub> -C <sub>32</sub>	Modified TPH	
SURFACE UP	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05) <sup>1</sup>	<(0.05) <sup>1</sup>		<(0.05) <sup>1</sup>	<(0.15) <sup>1</sup>	-
	Aug 19, 2009	<	<	<	<	<	<		<	<	-
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	<	<	<	<	<		<	<	-
	Nov 07, 2012	<	<	<	<	<	<		<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 08, 2015	<	<	<	<	<	<	<	<	<	-
Oct 12, 2017	<	<	<	<	<	<	<	<	<	-	
SURFACE DOWN	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05) <sup>1</sup>	<(0.05) <sup>1</sup>		<(0.05) <sup>1</sup>	<(0.15) <sup>1</sup>	-
	Aug 19, 2009	<	<	<	<	<	<		<	<	-
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	0.02	<	<	<	<		<	<	-
	Nov 07, 2012	<	<	<	<	<	<		<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Dec 08, 2015	<	<	<	<	<	<	<	<	<	-
Oct 12, 2017	<	<	<	<	<	<	<	<	<	-	
RDL	0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-	
2007 CCME Freshwater Aquatic Life Guidelines <sup>2</sup>		4.00	2.00	0.39	-	-	-	-	-	-	Gasoline
											Diesel #2 Fuel Oil
											#6 Oil
1997 BC Guidelines for Protection of Aquatic Life <sup>3</sup>		-	-	-	-	1.5	0.5	-	-	-	-
											-
											-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.

1. Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report
2. 2007 CCME Freshwater Aquatic Life Guidelines
3. BC Ministry of Water, Land and Air Protection Guidelines for Protection of Aquatic Life

RDL = Reportable Detection Limit

< = Parameter below detection limit

- = Not analysed

DUP = Laboratory duplicate

0.0 = above criteria

<(#)= Parameter below AMEC laboratory detection limit

TABLE D8

**HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022) - BTEX/MTPH  
2022/23 MONITORING AND MAINTENANCE PROGRAM  
COME BY CHANCE SECURE LANDFILL  
COME BY CHANCE, NL**

PARAMETER		RDL	UNITS	RBCA Ecological Tier I EQS <sup>1</sup>		SAMPLE ID, Date					
				Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
BTEX	Benzene	0.00050	mg/L	2.1		<0.001	<0.00050	<0.001	<0.00050	<0.001	<0.00050
	Toluene	0.00050	mg/L	0.77		<0.001	<0.00050	<0.001	<0.00050	<0.001	<0.00050
	Ethylbenzene	0.00050	mg/L	0.32		<0.001	<0.00050	<0.001	<0.00050	<0.001	<0.00050
	Xylenes	0.00050	mg/L	0.33		<0.002	<0.00050	<0.002	<0.00050	<0.002	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>6</sub> -C <sub>10</sub> )	0.025	mg/L	-		<0.01	<0.025	<0.01	<0.025	<0.01	<0.025
	Fuel Range (>C <sub>10</sub> -C <sub>16</sub> )	0.050	mg/L	-		<0.05	<0.050	<0.05	<0.050	<0.05	<0.050
	Fuel Range (>C <sub>16</sub> -C <sub>21</sub> )	0.050	mg/L	-		<0.05	<0.050	<0.05	<0.050	<0.05	<0.050
	Lube Range (>C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-		-	<0.050	-	<0.050	-	<0.050
Total Modified TPH		0.090	mg/L	1.5 as gas		<0.1	<0.090	<0.1	<0.090	<0.1	<0.090
Reached Baseline at C32		-	-	-		-	Yes	-	Yes	-	Yes
Product Resemblance		none	-	-		-	N/A	-	N/A	-	N/A

**Notes:**

\* Indicates field duplicate.

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

TABLE D9

HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP										SURFACE DOWN									
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	5.8	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	4.4	-	-	<	<	-	-	<	<	<	<	<	-	-	<	<	-	-	<	<	<
Anthracene	0.01	0.012	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	0.018	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.015	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	-	-	-	-	<	<	<	<	<	<	-	-	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	-	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	NA	<	<	<	<	<	<	<	<
Fluoranthene	0.01	0.04	<0.03	<	<	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Fluorene	0.01	3.0	<0.03	<	<	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	-	<0.05	<	<	<	<	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<
Naphthalene	0.2	1.1	-	<	<	<	<	<	<	<	<	<	<	NA	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	0.01	<	<	<	<	<	<	<	<	NA	<	<	<	<	<	<	<	<
Phenanthrene	0.01	0.4	<0.04	<	<	<	<	<	0.011	<	<	<	<	<0.04	0.01	<	<	<	<	0.012	<	<
Pyrene	0.01	0.025	<	<	<	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<
Quinoline	0.05	3.4	-	-	<	<	-	-	<	<	<	<	<	-	-	<	<	-	-	<	<	<

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.  
 \* Canadian Council of Ministers of the Environment (CCME) Canadian Water  
 Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit

TABLE D9

HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date					
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
					14-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
1- Methylanthalene	0.01	ug/L	2	1	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
2-Methylanthalene	0.01	ug/L	2	1	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acenaphthene	0.01	ug/L	5.8	6	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acenaphthylene	0.01	ug/L	-	-	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Acridine	0.012	ug/L	-	-	<0.01	-	<0.01	-	<0.01	-
Anthracene	0.01	ug/L	0.012	0.1	<0.012	<0.010	<0.012	<0.010	<0.012	<0.010
Benzo(a)anthracene	0.01	ug/L	0.018	-	<0.018	<0.010	<0.018	<0.010	<0.018	<0.010
Benzo(a)pyrene	0.005	ug/L	0.015	0.01	<0.010	<0.0050	<0.010	<0.0050	<0.010	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	<0.01	-	<0.01	-	<0.01	-
Benzo(b/j)fluoranthene	0.01	ug/L	-	-	-	<0.010	-	<0.010	-	<0.010
Benzo(g,h,i)perylene	0.01	ug/L	-	-	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	-	<0.010	-	<0.010	-	<0.010
Chrysene	0.01	ug/L	0.1	0.1	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	<0.01	<0.0050	<0.01	<0.0050	<0.01	<0.0050
Fluoranthene	0.01	ug/L	0.04	0.2	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Fluorene	0.01	ug/L	3	12	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Naphthalene	0.01	ug/L	1.1	1.4	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Perylene	0.01	ug/L	-	-	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Phenanthrene	0.01	ug/L	0.4	0.3	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Pyrene	0.01	ug/L	0.025	0.02	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010
Quinoline	0.01	ug/L	-	-	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010

Notes:

\* Indicates field duplicate sample.

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

TABLE D10

HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - PCBs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP									
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Total Polychlorinated Biphenyls	0.05	-	<0.04	0.11	<	<	<	<	<	<	<	<

Parameter	RDL	Criteria*	SURFACE DOWN									
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Total Polychlorinated Biphenyls	0.05	-	<0.04	0.13	<	<	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality

Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit

< = Parameter below detection limit

< (#) = Parameter below AMEC laboratory detection limit

0.0

= above criteria

TABLE D10

HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022) - PCBs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date					
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
					8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
Polychlorinated Biphenyls	0.060	ug/L	0.001	-	<0.05	<0.060	<0.05	<0.060	<0.05	<0.060

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).  
 - = No applicable guideline or parameter not defined.

TABLE D11

HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - VOCs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP										SURFACE DOWN									
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Benzene	1	370	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1	13.3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	1.3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroform	1	1.8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	0.7	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,3-Dichlorobenzene	1	150	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	26	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	100	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	90	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	98.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Styrene	1	300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	72	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	111	<	<	<	<	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	2.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	21	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Vinyl Chloride	0.5	-	0.2	<	<	<	<	<	<	<	<	<	0.2	<	<	<	<	<	<	<	<	<

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 0.0 = above criteria

TABLE D11

HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022) - VOCs (ug/L)  
2022/23 MONITORING AND MAINTENANCE PROGRAM  
COME BY CHANCE SECURE LANDFILL  
COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date					
			Fresh Water <sup>1</sup>	Marine <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
					14-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
1,1,1,2-Tetrachloroethane	0.50	ug/L	20	-	<0.5	-	<0.5	-	<0.5	-
1,1,1-Trichloroethane	0.50	ug/L	10	-	<1	<0.50	<1	<0.50	<1	<0.50
1,1,2,2-Tetrachloroethane	0.50	ug/L	70	-	<1	<0.50	<1	<0.50	<1	<0.50
1,1,2-Trichloroethane	0.50	ug/L	800	-	<1	<0.50	<1	<0.50	<1	<0.50
1,1-Dichloroethane	0.50	ug/L	200	-	<1	<0.50	<1	<0.50	<1	<0.50
1,1-Dichloroethylene	0.50	ug/L	40	-	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50
1,2-Dibromoethane	0.20	ug/L	-	-	<0.2	-	<0.2	-	<0.2	-
1,2-Dichlorobenzene	0.50	ug/L	0.7	42	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50
1,2-Dichloroethane	0.50	ug/L	100	100	<2	<0.50	<2	<0.50	<2	<0.50
1,2-Dichloropropane	0.50	ug/L	1	3,040	<0.7	<0.50	<0.7	<0.50	<0.7	<0.50
1,3-Dichlorobenzene	0.50	ug/L	150	150	<1	<0.50	<1	<0.50	<1	<0.50
1,4-Dichlorobenzene	0.50	ug/L	26	26	<1	<0.50	<1	<0.50	<1	<0.50
2-Hexanone	10.0	ug/L	-	-	<10.0	-	<10.0	-	<10.0	-
Acetone	10.0	ug/L	-	-	<10	-	<10	-	<10	-
Benzene	1.0	ug/L	2,100	-	<1	-	<1	-	<1	-
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	200	6,400	<1	<0.50	<1	<0.50	<1	<0.50
Bromoform (Tribromomethane)	0.50	ug/L	60	6,400	<1	<0.50	<1	<0.50	<1	<0.50
Bromomethane (Methyl bromide)	0.50	ug/L	1	6,400	<0.89	<0.50	<0.89	<0.50	<0.89	<0.50
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	13	13	<0.56	<0.20	<0.56	<0.20	<0.56	<0.20
Chlorobenzene	0.50	ug/L	1.3	25	<1	<0.50	<1	<0.50	<1	<0.50
Chloroethane (Ethyl chloride)	0.50	ug/L	5	-	<5	<0.50	<5	<0.50	<5	<0.50
Chloroform (Trichloromethane)	0.50	ug/L	1.8	2	<1	<0.50	<1	<0.50	<1	<0.50
Chloromethane (Methyl chloride)	2.0	ug/L	700	6,400	<1	<2.0	<1	<2.0	<1	<2.0
cis-1,2-Dichloroethylene	0.50	ug/L	200	-	<2	<0.50	<2	<0.50	<2	<0.50
cis-1,3-Dichloropropylene	0.30	ug/L	-	-	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30
Dibromochloromethane	0.50	ug/L	40	6,400	<1	<0.50	<1	<0.50	<1	<0.50
Ethylbenzene	1.0	ug/L	320	-	<2	-	<2	-	<2	-
m,p-Xylene	2.0	ug/L	-	-	<4	-	<4	-	<4	-
Ethylene Dibromide (1,2-Dibromoethane)	0.20	ug/L	5	-	-	<0.20	-	<0.20	-	<0.20
Methylene Chloride (Dichloromethane)	1.0	ug/L	98	98	<2	<1.0	<2	<1.0	<2	<1.0
o-Xylene	1.0	ug/L	-	-	<1	-	<1	-	<1	-
Styrene	0.50	ug/L	72	-	<1	<0.50	<1	<0.50	<1	<0.50
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	110	110	<2	<0.50	<2	<0.50	<2	<0.50
Toluene	1.0	ug/L	770	-	<2	-	<2	-	<2	-
Total Xylenes	1.0	ug/L	330	-	<4	-	<4	-	<4	-
trans-1,2-Dichloroethylene	0.50	ug/L	200	-	<2	<0.50	<2	<0.50	<2	<0.50
trans-1,3-Dichloropropylene	0.30	ug/L	-	-	<0.5	<0.30	<0.5	<0.30	<0.5	<0.30
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	21	20	<1	<0.50	<1	<0.50	<1	<0.50
Trichlorofluoromethane (Freon 11)	0.50	ug/L	-	-	<5	<0.50	<5	<0.50	<5	<0.50
Vinyl Chloride	0.50	ug/L	600	-	<0.6	<0.50	<0.6	<0.50	<0.6	<0.50

## Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.



TABLE D12  
 HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - GEN. CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SURFACE UP										SURFACE DOWN									
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Dec 08, 2015	Oct 12, 2017	Nov 25, 2014
Anion Sum	me/L	N/A	-	-	4.8	1.14	0.34	0.68	0.610	0.64	0.82	1.02	0.94	-	3.78	2.69	1.53	3.8	0.630	0.69	1.12	1.07	0.84
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	118	38	6	17	7.6	11	10	9.3	18	-	150	117	12	159	8.2	12	9.1	21	10
Calculated TDS	mg/L	1	-	53	267	62	23	63	38.0	39	51	62	53	145	205	140	122	204	39.0	41	66	61	51
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	<	<	<	<	<	<	<	<	<	-	3	<	<	<	<	<	<	<	<
Cation Sum	me/L	N/A	-	-	4.8	1.05	0.43	1.45	0.650	0.74	0.85	1.04	0.90	-	3.8	2.54	2.4	3.85	0.650	0.74	1.09	1.02	0.84
Hardness (CaCO3)	mg/L	1	-	21.5	100	41	10	29	14	15	17	22	18	138	170	110	70	170	14	16	23	21	18
Ion Balance (% Difference)	%	N/A	-	-	0.6	4.11	11.7	36.2	3.17	7.25	1.8	0.97	2.17	-	0.26	2.87	22.1	0.65	1.56	3.5	1.4	2.4	0.0
Langelier Index (@ 20C)	N/A	N/A	-	-	-0.4	-1.36	-3.49	-3.19	-2.97	-2.82	-2.69	-2.42	-1.96	-	0.996	-0.099	-2.64	0.248	-2.95	-2.57	-2.47	-1.92	-2.73
Langelier Index (@ 4C)	N/A	N/A	-	-	-0.7	-1.61	-3.74	3.44	-3.22	-3.07	-2.94	-2.67	-2.21	-	0.746	-0.35	-2.89	-0.002	-3.20	-2.82	-2.72	-2.17	-2.98
Nitrate (N)	mg/L	0.05	13	<	<	0.17	<	<	0.054	<	0.068	0.1	<	<	<	<	2	1.6	0.058	<	0.072	<	0.076
Saturation pH (@ 20C)	N/A	N/A	-	-	7.8	8.62	10.1	9.18	9.83	9.61	9.61	9.54	9.32	-	7.39	7.69	9.01	7.39	9.80	9.56	9.53	9.2	9.59
Saturation pH (@ 4C)	N/A	N/A	-	-	8.1	8.87	10.3	9.43	10.1	9.86	9.86	9.79	9.57	-	7.64	7.94	9.26	7.64	10.0	9.81	9.79	9.45	9.85
Total Alkalinity (Total as CaCO3)	mg/L	30	-	24	120	39	39	17	7.6	11	10	9.3	18	136	150	120	120	160	8.2	12	9.1	21	10
Carbonaceous BOD	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	8.9	79	5	6	7	12	12	17	24	18	3.6	4	1	23	8	12	13	26	20	16
Colour	TCU	5	-	-	44	38	49	140	67	65	52	44	41	-	23	39	120	32	78	71	47	38	57
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	-	<	0.17	<	<	0.054	<	0.068	0.1	<	<	<	<	2	1.6	0.058	<	0.072	<	0.076
Nitrite (N)	mg/L	0.01	0.06	<0.015	<	<	<	<	<	<	<	<	<	<0.015	<	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	-	0.1	<	<	<	<	<	<	<	<	-	<	0.19	0.06	<	<	<	<	0.23	<
Total Organic Carbon (C)	mg/L	0.5	-	9.5	5.7	6	6.4	41	7.9	8.2	6.4	7.16	7.5	9.2	4.3	5.4	18	2.8	7.9	7.9	7.8	7.3	6.8
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<	<
pH	pH	N/A	6.5 - 9	6.9	7.4	7.26	6.58	5.99	6.86	6.79	6.92	7.12	7.36	7.48	8.39	7.59	6.37	7.64	6.85	6.99	7.06	7.28	6.87
Phenols-4AAP	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.5	-	-	6.3	1.5	1.5	3.5	2.1	1.5	2.3	7.97	1.8	-	4	3.1	7.4	1.8	2.2	1.6	6.82	2.1	2.4
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	840	-	-	-	-	-	-	-	-	-	160	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	-	8	11	3	-	5.7	3.2	6.7	2.3	2.8	-	29	15	24	-	5.8	3.5	2.3	4.8	7.8
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	-	2.9	3.8	2.2	30	0.72	1.6	3	1.2	0.72	-	5.2	39	140	5.6	0.88	0.77	1.7	0.55	4.4
Conductivity	uS/cm	1	-	87	470	110	43	72	66	72	91	120	120	275	290	240	170	340	67	76	120	110	94
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:  
 Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 < (#) = Parameter below AMEC laboratory detection limit  
 0.0 = above criteria  
 = above criteria

TABLE D12

HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022) - GEN. CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date					
			Fresh Water <sup>1</sup>	Marine <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
					14-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
pH	0.1	-	6.5 - 9	7.0 - 8.7	6.38	6.58	6.59	6.49	6.44	6.51
Reactive Silica as SiO2					19.4	-	4	-	<0.5	-
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCL)	8	9,830	8	10,100	9	10,000
Fluoride	20	ug/L	120	1500	<0.12	<20	<0.12	<20	<0.12	<20
Sulphate	300	ug/L	128,000	-	<2	2,210	2	2,880	2	2,640
Alkalinity	1000	ug/L	-	-	<5	4,500	<5	4,400	<5	4,200
True Color	2	TCU	-	-	4450	85.3	6	84.3	26	86.1
Turbidity	0.1	NTU	-	-	2.6	1.42	2	1.45	2	1.41
Electrical Conductivity	1	uS/cm	-	-	48	51.2	48	52.8	47	52.5
Nitrate + Nitrite as N	3.2	ug/L	-	-	<0.05	450	0	470	0	470
Nitrate as N	20	ug/L	13,000	200,000	<0.05	45	0	47	0	47
Nitrite as N	10	ug/L	60	-	<0.05	<10	<0.05	<10	<0.05	<10
Ammonia as N	5	ug/L	73.0 (SURF-UP, SURF-DOWN and SURF-DOWN (DUP))	18,400 (SURF-UP, SURF-DOWN and SURF-DOWN (DUP))	<0.03	<5	0	24	0	<5
Ortho-Phosphates as P	1	ug/L	-	-	1.18	<1	<0.01	5	<0.01	<1
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	<5	5,500	<5	5,400	<5	5,100
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	<10	<1000	<10	<1000	<10	<1000
Hydroxide	1000	ug/L	-	-	<5	<1000	<5	<1000	<5	<1000
Calculated TDS	10	ug/L	-	-	17	48,000	21	59,000	22	60,000
Hardness	0.5	ug/L	-	-	8.7	8,380	9	8,750	10	9,220
Total Organic Carbon					-	-	11	-	11	-
Langelier Index (@20C)	0.01	NA	-	-	-4.12	-3.72	-4	-3.80	-4	-3.78
Langelier Index (@4C)	0.01	NA	-	-	-4.44	-3.97	-4	-4.06	-4	-4.03
Saturation pH (@20C)	0.01	NA	-	-	10.5	10.3	10.4	10.3	10	10.3
Saturation pH (@4C)	0.01	NA	-	-	10.8	10.6	11	10.5	11	10.5
Anion Sum	0.1	me/L	-	-	0.23	0.42	0	0.44	0	0.42
Cation Sum	0.1	me/L	-	-	0.44	0.48	1	0.49	1	0.59
% Difference / Ion Balance	0.01	%	-	-	32.3	114	30	111	26.5	140

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

- = No applicable guideline or parameter not defined.

**Value<sup>x</sup>** Exceeds Fresh Water or Marine criteria reference below.

TABLE D13

HISTORICAL SURFACE WATER ANALYTICAL (2008 - 2017) - METALS  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SURFACE UP										SURFACE DOWN									
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Aluminum (Al)	ug/L	5.0	100 <sup>(1)</sup>	484	18	108	257	1,140	113	86	270	99	43	42,000	69	527	5,210	941	117	83	270	110	61
Antimony (Sb)	ug/L	1.0	-	<	<	<	<	-	<	<	<	ND	<	<	<	<	<	<	<	<	<	ND	<
Arsenic (As)	ug/L	1.0	5.0	3	<	<	<	2.50	<	<	<	ND	<	36	<	1.1	3.3	2.5	<	<	<	ND	<
Barium (Ba)	ug/L	1.0	-	131	26	22.3	9.4	132.0	8.9	9.1	11	9.1	6.9	426	82	102	289	179	8.6	8.6	11	9.3	7.4
Beryllium (Be)	ug/L	1.0	-	<0.1	<	<	<	<	<	<	<	ND	<	1.8	<	<	<	<	<	<	<	ND	<
Bismuth (Bi)	ug/L	2.0	-	<0.5	<	<	<	<	<	<	<	ND	<	<0.1	<	<	<	<	<	<	<	ND	<
Boron (B)	ug/L	5	-	-	14	9.4	6.9	<50	<	<	<	ND	<	-	22	27.1	9	<	<	<	<	ND	<
Cadmium (Cd)	ug/L	0.017	0.04 <sup>(2)</sup>	0.273	<	0.028	0.04	0.066	<	<	<	ND	<	2.65	<	0.044	0.232	-	<	<	<	ND	<
Calcium (Ca)	ug/L	100	-	-	-	12,900	2,960	8,230	3,870	4,500	4,900	6,400	5,300	-	-	40,100	18,300	62,300	3,890	4,500	5,000	6,800	6,200
Chromium (Cr)	ug/L	1	8.9/1.0 <sup>(3)</sup>	1	<	<	<	2.3	<	<	<	ND	<	110	<	<	8	163	<	<	<	ND	<
Hexavalent Chromium (Cr <sup>6+</sup> )	ug/L	1	1.00						<	0.61	0.63	ND	<					<		0.68	0.74	ND	<
Cobalt (Co)	ug/L	0.4	-	1	<	<	<	1.9	<	<	<	ND	<	307	<	0.9	6.69	1.98	<	<	<	ND	<
Copper (Cu)	ug/L	2	2 <sup>(4)</sup>	8	<	<	<	5.3	<	<	5	440	<	370	<	12.7	32.9	3	<	<	<	270	<
Iron (Fe)	ug/L	50	300	1,300	1,300	289	722	16,700	387	530	310	ND	420	59,000	380	1,820	10,900	4,130	382	440	300	ND	300
Lead (Pb)	ug/L	0.5	1, 2 <sup>(5)</sup>	5	<	<	<	0.5	<	<	<	1300	<	45	<	1.48	7.64	0.69	<	<	<	1500	<
Magnesium (Mg)	ug/L	100	-	-	-	2,140	713	100	1,040	1,000	1,200	88	1,100	-	-	3,320	5,840	3,830	1,050	1,100	1,300	66	1,300
Manganese (Mn)	ug/L	2	-	1,260	230	98	142	2	41	110	49	ND	85	2,620	62	481	427	1,760	38	66	41	ND	55
Molybdenum (Mo)	ug/L	2	73.00	2	3.0	<	<	2	<	<	<	ND	<	0.09	<	<	<	<2	<	<	<	ND	<
Nickel (Ni)	ug/L	2	25, 65 <sup>(6)</sup>	1	<	<	<	2	<	<	<	ND	<	2	<	3	16.7	-	<	<	<	ND	<
Phosphorus (P)	ug/L	100	-	-	-	<	<	-	<	<	<	550	<	-	-	120	852	-	<	<	<	430	<
Potassium (K)	ug/L	100	-	-	-	588	295	100	363	310	860	ND	340	-	-	1080	4060	1030	400	320	580	ND	370
Selenium (Se)	ug/L	1	1.0	1	<	<	<	1	<	<	<	ND	<	<	<	<	<	<1	<	<	<	ND	<
Silver (Ag)	ug/L	0.1	0.1	<	<	<	<	0.1	<	<	<	13000	<	0.5	<	<	<	<	<	<	<	14000	<
Sodium (Na)	ug/L	100	-	-	-	4,720	3,680	100	7,930	9,300	11,000	19	12,000	-	-	4,300	11,500	5,820	7,880	9,100	11,000	20	13,000
Strontium (Sr)	ug/L	2	-	-	90	40.7	9.7	2	13.4	16	16	ND	17	-	110	85.4	49.9	110	13.3	17	17	ND	20
Thallium (Tl)	ug/L	0.1	0.8	-	<	<	<	0.1	<	<	<	ND	<	-	<	<	<	<0.1	<	<	<	ND	<
Tin (Sn)	ug/L	2	-	-	<	<	<	2	<	<	<	11	<	-	<	<	<	<2	<	<	<	ND	<
Titanium (Ti)	ug/L	2	-	-	<	2.1	7.9	2	3.1	2	5	ND	<	-	2.0	17.2	148	37.2	2.7	2.5	3.5	ND	<
Uranium (U)	ug/L	0.1	-	-	0.2	<	<	0.1	<	<	<	ND	<	-	0.9	0.38	0.38	0.35	<	<	<	ND	<
Vanadium (V)	ug/L	2	-	<	<	<	<	2	<	<	<	ND	<	155	<	<	0.34	2.8	<	<	<	ND	<
Zinc (Zn)	ug/L	5	30	33	<	9.2	10.7	5	<	<	18	ND	<	443	<	25.2	103	12.4	<	<	<	37	
Hardness (CaCO3)	mg/L	1	-	21.5	100	41	10	29	14	15	17	-	-	138	170	110	70	170	14	16	18	-	-
pH	pH	-	6.5 - 9	6.9	7.4	7.26	6.58	5.99	6.86	6.79	6.92	-	-	7.48	8.39	7.59	6.37	7.64	6.85	6.99	6.87	-	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

(1) Aluminum guideline = 5 ug/L at pH < 6.5  
 = 100 ug/L at pH ≥ 6.5

(2) Cadmium guideline = 10<sup>[0.86(log[hardness]-3.2)]</sup>

(3) Criteria for Chromium (III) = 8.9 ug/L, Criteria for Chromium (VI) = 1.0 ug/L

(4) Copper guideline = 2 ug/L at [CaCO<sub>3</sub>] = 0-120 mg/L  
 = 3 ug/L at [CaCO<sub>3</sub>] = 120-180 mg/L  
 = 4 ug/L at [CaCO<sub>3</sub>] >180 mg/L

(5) Lead guideline = 1 ug/L at [CaCO<sub>3</sub>] = 0-60 mg/L  
 = 2 ug/L at [CaCO<sub>3</sub>] = 60-120 mg/L  
 = 4 ug/L at [CaCO<sub>3</sub>] = 120-180 mg/L  
 = 7 ug/L at [CaCO<sub>3</sub>] >180 mg/L

(6) Nickel guideline = 25 ug/L at [CaCO<sub>3</sub>] = 0-60 mg/L  
 = 65 ug/L at [CaCO<sub>3</sub>] = 60-120 mg/L  
 = 110 ug/L at [CaCO<sub>3</sub>] = 120-180 mg/L  
 = 150 ug/L at [CaCO<sub>3</sub>] >180 mg/L

RDL = Reportable Detection Limit

- = Not analysed/No criteria  
 < = Parameter below detection limit  
**0.0** = above criteria

TABLE D13

HISTORICAL SURFACE WATER ANALYTICAL (2021 - 2022)- METALS  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		Sample ID & Date					
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>	SURF-UP		SURF-DOWN		SURF-DOWN (DUP)	
					14-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
Aluminum	30	ug/L	5	-	159	150	211	151	228	156
Antimony	0.10	ug/L	9	250	<3.0	<0.10	<3.0	<0.10	<3.0	<0.10
Arsenic	0.10	ug/L	5	12.5	<3.0	0.22	<3.0	0.21	<3.0	0.20
Barium	0.10	ug/L	1,000	500	7	6.5	7.7	6.3	7.5	6.5
Beryllium	0.020	ug/L	0.15	100	<0.50	<0.020	<0.50	<0.020	<0.50	<0.020
Bismuth	0.050	ug/L	-	-	<2.0	<0.050	<2.0	<0.050	<2.0	<0.050
Boron	10	ug/L	1,500	1,200	16	<10	31	<10	25	<10
Cadmium	0.005	ug/L	0.09	0.12	<0.10	<0.005	<0.10	<0.005	<0.10	<0.005
Calcium	100	ug/L	-	-	2.12	2,260	2	2,390	3	2,560.00
Trivalent Chromium	0.001	mg/L	-	-	<0.001	-	<0.001	-	<0.001	-
Hexavalent Chromium	0.005	mg/L	-	-	<0.005	-	<0.005	-	<0.005	-
Chromium (total)	0.50	ug/L	8.9	56	<3.0	<0.50	<3.0	<0.50	<3.0	<0.51
Cesium	0.01	ug/L	-	-	-	0.015	-	0.011	-	0.013
Cobalt	0.10	ug/L	1	4	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10
Copper	0.50	ug/L	2	2	<1.0	0.50	<1.0	<0.50	<1.0	0.53
Iron	10	ug/L	300	-	460	437	512	411	480	421
Lead	0.05	ug/L	1	2	<1.0	0.183	<1.0	0.146	<1.0	0.156
Lithium	1.00	ug/L	-	-	-	<1.0	-	<1.0	-	<1.0
Magnesium	0.10	ug/L	-	-	0.82	666	1	676	1	689
Manganese	0.10	ug/L	430	-	30.400	25	40	30	40	31.7
Molybdenum	0.50	ug/L	73	1000	<2.0	0.06	<2.0	0.06	<2.0	0.054
Nickel	5	ug/L	25	8.3	<3.0	0.63	<3.0	0.65	<3.0	0.70
Phosphorus	50	ug/L	-	-	<0.10	<50	<0.10	<50	<0.10	<50
Potassium	50	ug/L	-	-	<1.15	256	<1.15	250	<1.15	257
Rubidium	0.20	ug/L	-	-	-	0.38	-	0.34	-	0.37
Selenium	0.50	ug/L	1	2	3.9	0.069	<1.0	0.056	<1.0	0.058
Silicon (as SiO <sub>2</sub> )	250	ug/L	-	-	-	2,350	-	2,350	-	2,310
Silicon	100	ug/L	-	-	-	1,100	-	1,100	-	1,080
Silver	0.01	ug/L	0.25	1.5	<0.10	<0.010	0.120	<0.010	<0.10	<0.010
Sodium	50	ug/L	-	-	5.35	6,310	6	6,340	6	8,450
Strontium	0.20	ug/L	21,000	-	7.5000	8.94	12.2	9.16	11.4	9.25
Sulfur	500	ug/L	-	-	-	580	-	740	-	3,330
Tellurium	0.20	ug/L	-	-	-	<0.20	-	<0.20	-	<0.20
Thallium	0.01	ug/L	0.8	0.3	<0.30	<0.010	<0.30	<0.010	<0.30	<0.010
Thorium	0.10	ug/L	-	-	-	<0.10	-	<0.10	-	<0.10
Tin	0.10	ug/L	-	-	<2.0	<0.10	<2.0	<0.10	<2.0	<0.10
Titanium	0.30	ug/L	-	-	<10.0	3.30	<10.0	2	<10.0	3
Tungsten	0.10	ug/L	-	-	-	<0.10	-	<0.10	-	<0.10
Uranium	0.01	ug/L	15	8.5	<0.50	0.012	<0.50	0.012	<0.50	0.014
Vanadium	0.50	ug/L	120	5	<2.0	1.0	<2.0	0.95	<2.0	1.0
Zinc	3	ug/L	7	10	<20	<3	<20	<3	<20	<3
Zirconium	0.20	ug/L	-	-	-	<0.20	-	<0.20	-	<0.20

Notes:

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

**Value<sup>x</sup>** Exceeds Fresh Water or Marine criteria reference below.

TABLE D14

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - BTEX/MTPH  
2022/23 MONITORING AND MAINTENANCE PROGRAM  
COME BY CHANCE SECURE LANDFILL  
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl- benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C <sub>6</sub> -C <sub>10</sub>	F2 C <sub>10</sub> -C <sub>16</sub>	F3 C <sub>16</sub> -C <sub>21</sub>	C <sub>21</sub> -C <sub>32</sub>	Modified TPH	
PLCS	Aug 19, 2009	<	<	<	<	<	0.08		0.1	0.2	NR
	Oct 13, 2009	<	<	<	<	<	0.2		0.1	0.3	WFO
	Jan 26, 2010	<	<	<	<	<	0.09		<	<	WFO
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	<	<	<	<	0.05		<	<	-
	Feb 07, 2012	<	<	<	<	<	0.05		<	<	-
	Aug 30, 2012	<	<	<	<	<	<		<	<	-
	Aug 30, 2012 DUP-04	<	<	<	<	<	0.173		<	0.18	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013	<	<	<	<	<	<		<	<	-
	Nov 25, 2014	<	<	<	<	<	<		<	<	-
	Nov 25, 2014 (DUP-08)	<	<	<	<	<	<		<	<	-
	Dec 08, 2015	<	<	<	<	<	<		<	<	-
	Oct 12, 2017	<	<	<	<	<	<		<	<	-
SLCS	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05) <sup>1</sup>	<(0.05) <sup>1</sup>		<(0.05) <sup>1</sup>	<(0.15) <sup>1</sup>	-
	Aug 19, 2009	<	<	<	<	<			<	<	-
	Oct 13, 2009	<	<	<	<	<	0.14		<	<	WFO
	Jan 26, 2010	<	<	<	<	<	0.11		<	0.1	WFO
	Jan 26, 2010 <sup>2</sup>	<	<	<	<	<	0.11		<	0.1	WFO
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	0.05		<	<	-
	Sep 02, 2011	<	<	<	<	<	0.05		<	<	-
	Feb 07, 2012	<	<	<	<	<	0.11		<	0.21	One product in fuel/ lube oil range
	Feb 07, 2012 (DUP)	<	<	<	<	<	0.11		<	0.11	One product in fuel/ lube oil range
	Aug 30, 2012	<	<	<	<	<	0.159		<	0.16	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013	<	<	<	<	<	0.058	0.062	<	0.12	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013 (DUP-06)	<	<	<	<	<	0.071	0.061	<	0.13	No resemblance to petroleum products in fuel oil range.
	Nov 25, 2015	<	<	<	<	<	<		<	<	-
Dec 08, 2015	<	<	<	<	<	<		<	<	-	
Oct 12, 2017	<	<	<	<	<	<		<	<	-	
<b>RDL</b>		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
<b>2007 CCME Freshwater Aquatic Life Guidelines<sup>3</sup></b>		4.00	2.00	0.39	-	-	-	-	-	-	-
<b>Schedule A Water &amp; Sewer Regulations<sup>*</sup></b>		-	-	-	-	-	-	-	-	15	-
<b>2012 Tier I Surface Water ESL - Freshwater<sup>4</sup></b>		2.10	0.77	0.32	0.33	-	-	-	-	1.5	Gasoline
										0.1	Diesel /#2 Fuel Oil
										0.1	#6 Oil

## Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.  
\* Schedule A of Environmental Control Water and Sewer Regulations, 2003.

1. Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report

2. Field Duplicate

3. 2007 CCME Freshwater Aquatic Life Guidelines

4. Atlantic Risk-Based Corrective Action (RBCA) Tier I Surface Water Ecological Screening Level (ESL) Table values for protection of freshwater and marine aquatic life.

PLCS = Primary Leachate Collection System  
SLCS = Secondary Leachate Collection System  
DUP-04 = Field Duplicate of PLCS  
DUP-06 = Field Duplicate of SLCS

RDL = Reportable Detection Limit  
< = Parameter below detection limit  
- = Not analysed  
0.0 = above criteria

G = Gasoline  
FO = Fuel Oil  
LO = Lube Oil  
W = Weathered

TABLE D14  
 HISTORICAL LEACHATE ANALYTICAL (2022) - BTEX/MTPH  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER		RDL	UNITS	Atlantic RBCA - Ecological Tier 1 EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	SAMPLE ID and Date	
				Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS	SLCS
							21-Dec-22	21-Dec-22
BTEX	Benzene	0.00050	mg/L	2.1	2.1	-	<0.00050	<0.00050
	Toluene	0.00050	mg/L	0.770	0.770	-	<0.00050	<0.00050
	Ethylbenzene	0.00050	mg/L	0.320	0.320	-	<0.00050	<0.00050
	Xylenes	0.00050	mg/L	0.330	0.330	-	<0.00050	<0.00050
Total Petroleum Hydrocarbons (TPH)	Gas Range (C <sub>7</sub> -C <sub>10</sub> )	0.025	mg/L	-	-	-	<0.025	<0.025
	Fuel Range (>C <sub>10</sub> -C <sub>16</sub> )	0.050	mg/L	-	-	-	<0.050	0.155
	Fuel Range (>C <sub>16</sub> -C <sub>21</sub> )	0.050	mg/L	-	-	-	<0.050	0.252
	Lube Range (>C <sub>21</sub> -C <sub>32</sub> )	0.050	mg/L	-	-	-	<0.050	0.074
Total Modified TPH		0.090	mg/L	1.5 as gas 0.1 as fuel oil / lube oil		15	<0.090	0.481
Reached Baseline at C32		-	-	-	-	-	Yes	Yes
Product Resemblance		none	-	-	-	-	N/A	NR

Notes:  
<sup>1</sup> Indicates field duplicate.  
<sup>1,2</sup> Atlantic RBCA Ecological Tier 1 Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).  
<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water)  
 NR = No Resemblance  
 - = No applicable guideline or parameter not defined.

Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.

TABLE D15

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*		PLCS													
		NL <sup>1</sup>	CCME <sup>2</sup>	Aug 19, 2009	Oct 13, 2009	Jan 25, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2012	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08	Dec 08, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	-	580	<	0.01	0.01	<	<	<	0.011	0.041	0.01	<	<	<	<	<
Acenaphthylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	-	-	-	-	<	<	<	<	-	<	-	<	<	<	<
Anthracene	0.01	-	1.2	<	0.05	0.06	<	0.04	<	<	<0.15 <sup>(1)</sup>	<0.040 <sup>(1)</sup>	<	<0.020 (1)	<	<	<
Benzo(a)anthracene	0.01	-	1.8	<	0.01	0.02	<	<	<	<	0.039	0.013	<	<	<	<	<
Benzo(a)pyrene	0.01	-	1.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	-	-	<	0.04	0.03	<	0.02	<	<	0.064	0.024	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	-	4	<	0.05	0.07	<	0.04	<	0.011	0.18	0.046	0.011	<	<	<	<
Fluorene	0.01	-	300	<	0.02	0.02	<	<	<	<	0.049	0.014	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	-	-	<	<	<	<	<	<	0.017	<	<	<	<	<	<	<
Naphthalene	0.2	-	110	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Phenanthrene	0.01	-	40	<	0.17	0.23	<	0.07	<	0.034	<0.020 <sup>(1)</sup>	<0.060 <sup>(1)</sup>	<	0.012	<	<	<
Pyrene	0.01	-	2.5	<	0.36	0.32	<	0.17	0.2	0.046	0.85	0.01	0.052	0.013	<	0.012	<
Quinoline	0.05	-	-	<	-	-	<	<	-	-	-	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

NL = Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

CCME = Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

PLCS = Primary Leachate Collection System

SLCS = Secondary Leachate Collection System

DUP-04= Field Duplicate of PLCS

DUP-06 = Field Duplicate of SLCS

( 1 ) = Elevated PAH RDL(s) due to matrix / co-extractive interference.

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(#)= Parameter below AMEC laboratory detection limit

0.0 = above NL criteria

0.0 = above CCME criteria for surface water

TABLE D15

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*		SLCS														
		NL <sup>1</sup>	CCME <sup>2</sup>	AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 25, 2010	Jan 25, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2012	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
1-Methylnaphthalene	0.05	-	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	-	<0.03	<	<	<	<	0.22	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	-	580	<0.04	<	<	0.01	<	<	<	<	<	0.019	0.014	0.017	<	<	<
Acenaphthylene	0.01	-	-	<0.03	<	<	<	<	<	<	<	<	0.018	<	<(0.02)	<	<	<
Acridine	0.05	-	-	-	-	-	-	-	<	<	<	<	-	-	-	<	<	<
Anthracene	0.01	-	1.2	<0.01	<	0.1	0.06	0.06	<	<	<	<	<0.20 <sup>(1)</sup>	<(0.06)	<(0.15)	<	<	0.018
Benzo(a)anthracene	0.01	-	1.8	<0.01	<	0.06	0.02	0.03	<	<	<	<	0.064	0.05	0.062	<	<	<
Benzo(a)pyrene	0.01	-	1.5	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-	-	-	-	-	-	-	-	-	-	-	<	<	<	<	<
Benzo(k)fluoranthene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	-	-	<0.04	<	0.09	0.04	0.04	<	0.01	<	0.013	0.10	0.085	0.11	<	<	<
Dibenz(a,h)anthracene	0.01	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	-	4	<0.03	<	0.26	0.11	0.11	0.01	<	<	0.018	0.37	0.24	0.29	0.01	<	0.037
Fluorene	0.01	-	300	<0.03	<	0.02	<	<	<	<	<	<	0.031	<(0.02)	<(0.04)	<	<	0.012
Indeno(1,2,3-cd)pyrene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.2	-	110	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Phenanthrene	0.01	-	40	<0.04	<	0.4	0.13	0.07	0.02	0.01	<	0.012	<0.30 <sup>(1)</sup>	<	<(0.04)	<	<	0.012
Pyrene	0.01	-	2.5	<0.01	<	1.5	0.55	0.55	0.06	<	<	0.085	1.8	1.3	1.7	0.064	<	0.14
Quinoline	0.05	-	-	-	-	-	-	-	<	<	-	-	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

NL = Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

CCME = Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

PLCS = Primary Leachate Collection System

SLCS = Secondary Leachate Collection System

DUP-04= Field Duplicate of PLCS

DUP-06 = Field Duplicate of SLCS

( 1 ) = Elevated PAH RDL(s) due to matrix / co-extractive interference.

RDL = Reportable Detection Limit

- = Not analysed/No criteria

< = Parameter below detection limit

<(#)= Parameter below AMEC laboratory detection limit

0.0 = above NL criteria

0.0 = above CCME criteria for surface water



TABLE D15

HISTORICAL LEACHATE ANALYTICAL (2021 - 2022)- PAHs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date			
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS		SLCS	
							21-Dec-22		21-Dec-22
1-Methylnaphthalene	0.01	ug/L	2	1	-	<0.010	<0.010	<0.010	0.015
2-Methylnaphthalene	0.01	ug/L	2	1	-	<0.010	<0.010	<0.010	<0.010
Acenaphthene	0.01	ug/L	5.8	6	-	<0.010	<0.010	<0.010	<0.101
Acenaphthylene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010
Acridine	0.012	ug/L	-	-	-	<0.010	-	<0.010	-
Anthracene	0.01	ug/L	0.012	0.1	-	<0.012	<0.010	<0.012	<0.116
Benzo(a)anthracene	0.01	ug/L	0.018	-	-	<0.018	<0.010	<0.018	0.042
Benzo(a)pyrene	0.005	ug/L	0.015	0.01	-	<0.010	<0.0050	<0.010	<0.0050
Benzo(b)fluoranthene	-	ug/L	-	-	-	<0.010	-	<0.010	-
Benzo(e)pyrene	0.01	ug/L	-	-	-	<0.010	-	<0.010	-
Benzo(b,j)fluoranthene	0.01	ug/L	-	-	-	-	<0.010	-	<0.010
Benzo(g,h,i)perylene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010
Benzo(j+k)fluoranthene	0.01	ug/L	-	-	-	<0.010	-	<0.010	-
Benzo(j)fluoranthene	-	ug/L	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	ug/L	-	-	-	-	<0.010	-	<0.010
Chrysene	0.01	ug/L	0.1	0.1	-	<0.010	<0.010	<0.010	0.054
Dibenzo(a,h)anthracene	0.005	ug/L	-	-	-	<0.010	<0.0050	<0.010	<0.0050
Fluoranthene	0.01	ug/L	0.04	0.2	-	0.15	<0.010	0.11	0.150
Fluorene	0.01	ug/L	3	12	-	0.23	<0.010	<0.010	<0.056
Indeno(1,2,3-cd)pyrene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010
Naphthalene	0.01	ug/L	1.1	1.4	-	<0.010	<0.010	<0.010	<0.010
Perylene	0.01	ug/L	-	-	-	<0.010	<0.010	<0.010	<0.010
Phenanthrene	0.01	ug/L	0.4	0.3	-	<0.010	<0.010	<0.010	<0.019
Pyrene	0.01	ug/L	0.025	0.02	-	1.03	0.022	0.89	0.890
Quinoline	0.01	ug/L	-	-	-	<0.010	-	<0.010	-

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated

Value	Exceeds Fresh Water and Marine criteria reference below.
Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.

**TABLE D16**  
**HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - PCBs (ug/L)**  
**2022/23 MONITORING AND MAINTENANCE PROGRAM**  
**COME BY CHANCE SECURE LANDFILL**  
**COME BY CHANCE, NL**

Parameter	RDL	Criteria*	PLCS													
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08	Dec 08, 2015	Oct 12, 2017
Total Polychlorinated Biphenyls	0.05	-	0.16	<	<	<	<	<	<	<	<	<	<	<	<	<

Parameter	RDL	Criteria*	SLCS													
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Total Polychlorinated Biphenyls	0.05	-	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<

**Notes:**

Analysis completed by Maxam Analytics Inc. laboratory in Bedford, NS.

\* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

PLCS = Primary Leachate Collection System  
 SLCS = Secondary Leachate Collection System  
 DUP-04= Field Duplicate of PLCS  
 DUP-06= Field Duplicate of SLCS  
 DUP-08 = Field Duplicate on PLCS  
 RDL = Reportable Detection Limit

< = Parameter below detection limit  
0.0 = above criteria

TABLE D16

HISTORICAL LEACHATE ANALYTICAL (2021 - 2022) - PCBs (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date			
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS		SLCS	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
Total Polychlorinated Biphenyls	0.060	ug/L	0.001	-	-	<0.05	<0.060	<0.05	<0.060

Notes:

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

Value	Exceeds Fresh Water and Marine criteria reference below.
Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.

TABLE D17  
 HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - VOCs  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	PLCS													
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08	Dec 08, 2015	Oct 12, 2017
Benzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<	<(4)	<	<	<	<	<	<
Carbon Tetrachloride	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<	<(10)	<	<	<	<	<	<
Chloroform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<	<(10)	<	<	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<	<	<	<	<	<
1,3-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<	<	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<	<	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<	<(3)	<	<	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	-	<	<	<	<	<	<	<	<(4)	<	<	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<	<(3)	<	<	<	<	<	<
Styrene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	-	<	<	<	<	<	<	<	<(10)	<	<	<	<	<	<
Vinyl Chloride	0.5	-	<	<	<	<	<	<	<	<(0.7)	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

\* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

PLCS = Primary Leachate Collection System

- = Not analysed/No criteria

SLCS = Secondary Leachate Collection System

< = Parameter below detection limit

DUP-04 = Field Duplicate of PLCS

DUP-06 = Field Duplicate of SLCS

RDL = Reportable Detection Limit

0.0 = above criteria

TABLE D17  
 HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - VOCs  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	SLCS														
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Benzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<	<(4)	<(4)	<	<	<	<	<	<
Carbon Tetrachloride	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<	<	<
Chloroform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<	<	<
1,3-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	-	<	<	<	<	<	<	<	<(4)	<(4)	<	<	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<	<	<
Styrene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<	<	<
Vinyl Chloride	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.  
 PLCS = Primary Leachate Collection System - = Not analysed/No criteria  
 SLCS = Secondary Leachate Collection System < = Parameter below detection limit  
 DUP-04 = Field Duplicate of PLCS  
 DUP-06 = Field Duplicate of SLCS  
 RDL = Reportable Detection Limit

0.0 = above criteria

TABLE D17

HISTORICAL LEACHATE ANALYTICAL (2021 - 2022) - VOCs  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date			
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS		SLCS	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
1,2-Dichlorobenzene	0.50	ug/L	0.7	42	-	<0.7	<0.50	<0.7	<0.50
1,1,1,2-Tetrachloroethane	0.5	µg/L	20	-	-	<0.5	-	<0.5	-
1,1,1-Trichloroethane	0.50	ug/L	10	-	-	<1	<0.50	<1	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	70	-	-	<1	<0.50	<1	<0.50
1,1,2-Trichloroethane	0.50	ug/L	800	-	-	<1	<0.50	<1	<0.50
1,1-Dichloroethane	0.50	ug/L	200	-	-	<1	<0.50	<1	<0.50
1,1-Dichloroethylene	0.50	ug/L	40	-	-	<0.6	<0.50	<0.6	<0.50
1,2-Dibromoethane	0.2	µg/L	-	-	-	<0.2	-	<0.2	-
1,2-Dichloroethane	0.50	ug/L	100	100	-	<2	<0.50	<2	<0.50
1,2-Dichloropropane	0.50	ug/L	0.7	3,040	-	<0.7	<0.50	<0.7	<0.50
1,3-Dichlorobenzene	0.50	ug/L	150	150	-	<1	<0.50	<1	<0.50
1,4-Dichlorobenzene	0.50	ug/L	26	26	-	<1	<0.50	<1	<0.50
2-Hexanone	10	µg/L	-	-	-	<10.0	-	<10.0	-
Acetone	10	µg/L	-	-	-	<10	-	<10	-
Benzene	1	µg/L	-	-	-	<1	-	<1	-
Bromodichloromethane (Dichlorobromomethane)	0.50	ug/L	200	6,400	-	<1	<0.50	<1	<0.50
Bromoform (Tribromomethane)	0.50	ug/L	60	6,400	-	<1	<0.50	<1	<0.50
Bromomethane (Methyl bromide)	0.50	ug/L	0.9	6,400	-	<0.89	<0.50	<0.89	<0.50
Carbon tetrachloride (Tetrachloromethane)	0.20	ug/L	13.3	13	-	<0.56	<0.20	<0.56	<0.20
Chlorobenzene	0.50	ug/L	1.3	25	-	<1	<0.50	<1	<0.50
Chloroethane (Ethyl chloride)	0.50	ug/L	1,100	-	-	<5	<0.50	<5	<0.50
Chloroform (Trichloromethane)	0.50	ug/L	1.8	2	-	<1	<0.50	<1	<0.50
Chloromethane (Methyl chloride)	2.00	ug/L	700	6,400	-	<1	<2.0	<1	<2.0
cis-1,2-Dichloroethylene	0.50	ug/L	200	-	-	<2	<0.50	<2	<0.50
cis-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.5	<0.30	<0.5	<0.30
Dibromochloromethane	0.50	ug/L	40	6,400	-	<1	<0.50	<1	<0.50
Ethylene Dibromide (1,2-Dibromoethane)	0.20	ug/L	5	-	-	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	2	µg/L	-	-	-	<2	-	<2	-
m,p-Xylene	4	µg/L	-	-	-	<4	-	<4	-
Methylene Chloride (Dichloromethane)	1.00	ug/L	98.1	98	-	<2	<1.0	<2	<1.0
o-Xylene	1	µg/L	-	-	-	<1	-	<1	-
Styrene	0.50	ug/L	72	-	-	<1	<0.50	<1	<0.50
Tetrachloroethylene (PCE, 1,1,2,2-Tetrachloroethene)	0.50	ug/L	110	110	-	<2	<0.50	<2	<0.50
Toluene	2	µg/L	-	-	-	<2	-	<2	-
Total Xylenes	4	µg/L	-	-	-	<4	-	<4	-
trans-1,2-Dichloroethylene	0.50	ug/L	200	-	-	<2	<0.50	<2	<0.50
trans-1,3-Dichloropropylene	0.30	ug/L	-	-	-	<0.5	<0.30	<0.5	<0.30
Trichloroethylene (TCE, 1,1,2-Trichloroethene)	0.50	ug/L	21	20	-	<1	<0.50	<1	<0.50
Trichlorofluoromethane (Freon 11)	0.50	ug/L	-	-	-	<5	<0.50	<5	<0.50
Vinyl Chloride	0.50	ug/L	600	-	-	<0.6	<0.50	<0.6	<0.50

Notes:

<sup>1,2</sup> Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

<b>Value</b>	Exceeds Fresh Water and Marine criteria reference below.
<b>Value</b>	Exceeds Fresh Water or Marine criteria reference below.
<b>Value</b>	Exceeds NL 65/03 Schedule A Regulations.
<b>Value</b>	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.

TABLE D18

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	PLCS												
				Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08	Dec 08, 2015	Oct 12, 2017
Anion Sum	me/L	N/A	-	2.30	12.20	12.20	4.86	10.10	4.21	12.5	9.53	10	3.36	3.18	6.6	3.98
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	90	482	453	176	400	167	520	390	420	140	120	270	170
Calculated TDS	mg/L	1	1,000	133	640	662	263	546	239	624	564	540	180	180	350	220
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	<	<	<	1	1	1	2.6	2.3	<	<	1.2	2.6	1.4
Cation Sum	me/L	N/A	-	2.30	11.60	11.90	4.47	10.10	4.06	10.7	12.3	10	3.18	3.27	6.46	3.92
Hardness (CaCO3)	mg/L	1	-	71	510	540	190	190	140	470	530	430	120	120	150	150
Ion Balance (% Difference)	%	N/A	-	0.40	2.40	1.30	4.18	0.00	1.81	7.94	12.9	0.05	2.75	1.40	1.07	0.76
Langelier Index (@ 20C)	N/A	N/A	-	-0.10	0.60	0.60	0.42	0.86	0.366	1.10	1.11	0.449	0.19	0.339	0.56	0.488
Langelier Index (@ 4C)	N/A	N/A	-	-0.40	0.30	0.30	0.17	0.61	0.116	0.856	0.864	0.202	-0.061	0.089	0.312	0.238
Nitrate (N)	mg/L	0.05	10	0.30	<	0.10	0.35	0.28	0.32	0.061	0.41	0.11	0.25	0.32	<	0.29
Saturation pH (@ 20C)	N/A	N/A	-	8.00	6.60	6.60	7.40	6.74	7.51	6.63	6.69	6.73	7.64	7.67	7.45	7.46
Saturation pH (@ 4C)	N/A	N/A	-	8.30	6.90	6.90	7.65	6.98	7.76	6.87	6.94	6.98	7.89	7.92	7.69	7.71
Total Alkalinity (Total as CaCO3)	mg/L	30.00	-	91	480	450	180	400	170	530	390	420	140	120	280	170
Carbonaceous BOD	mg/L	5.00	20	-	-	-	<	<	-	-	-	<	<	<	<	<
Dissolved Chloride (Cl)	mg/L	1	-	8	40	33	11	29	11	39	31	30	12	14	11	11
Colour	TCU	5	-	31	35	20	15	17	18	10	10	8.6	14	21	ND	22
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	25	-	-	-	<	<	-	<0.0020	-	<(2)	0.0017	<	ND	<
Nitrate + Nitrite	mg/L	0.05	-	0.30	<	0.10	0.37	0.28	0.32	0.061	0.41	0.11	0.25	0.32	ND	0.29
Nitrite (N)	mg/L	0.01	-	<	<	<	0.03	<	ND	<0.010	<	<	<	<	ND	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	2	<	0.30	0.40	<	0.10	ND	0.53	0.45	0.35	<	<	1.68	0.32
Total Organic Carbon (C)	mg/L	0.5	-	4.7	25.0	16.0	6.4	11.0	5.1	16 ( 1 )	20 (5)	13	3.9	3.7	0.011	5.9
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	ND	<0.010	<	<	<	<	8.01	<
pH	pH	N/A	5.5 - 9.0	7.90	7.20	7.20	7.82	7.59	7.88	7.73	7.8	7.18	7.83	8.01	7.35	7.95
Phenols-4AAP	mg/L	0.001	0.10	-	-	-	0.01	0.003	0.003	0.012	-	0.0064	0.0012	<	-	<
Reactive Silica (SiO2)	mg/L	0.5	-	4.30	16.00	16.00	8.40	13.00	12	17	14	14	7.4	7.6	4.4	9.5
Total Suspended Solids (TSS)	mg/L	2.0	30	-	2	6	11	17	5	9.8	-	1.6	<	<	-	6.4
Dissolved Sulphate (SO4)	mg/L	2.0	-	11	66	110	47	61	25	43	36	42	13	13	35	13
Sulphide	mg/L	0.02	0.50	-	-	-	<	<	ND	<0.020	-	<	<	<	<	<
Turbidity	NTU	0.1	-	0.4	62.0	6.8	1.6	16.0	0.7	160	12	140	0.68	0.51	>1000	2.5
Conductivity	uS/cm	1	-	220	1000	1000	440	840	400	1000	820	820	300	300	580	380
Total Oil & Grease	mg/L	5.00	-	-	-	-	<	<	-	-	-	<	<	<	-	-
Coliform-Fecal	#/100mL	-	1,000/100 mL	-	-	-	0	0	-	-	-	-	-	-	-	-
Coliform-Total	#/100mL	-	5,000/100 mL	-	-	-	>80	>80	-	-	-	-	-	-	-	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 Coliform analysis completed by Newfoundland and Labrador Government Services in Grand Falls-Windsor, NL.  
 \* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.  
 PLCS = Primary Leachate Collection System  
 SLCS = Secondary Leachate Collection System  
 DUP-04= Field Duplicate of PLCS  
 DUP-06= Field Duplicate of SLCS  
 RDL = Reportable Detection Limit  
 0.0 = above criteria  
 - = Not analysed/No criteria  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit

TABLE D18

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - GENERAL CHEMISTRY  
2022/23 MONITORING AND MAINTENANCE PROGRAM  
COME BY CHANCE SECURE LANDFILL  
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SLCS													
				AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Anion Sum	me/L	N/A	-	-	10.80	13.70	13.60	13.40	8.68	10.90	6.93	12.3	11.2	12.8	7.39	11.4	7.85
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	428	542	532	509	315	420	267	500	460	530	310	490	340
Calculated TDS	mg/L	1	1,000	780	598	737	728	716	460	574	383	647	640	710	390	620	410
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	<	<	<	<	1	2	2	2.2	<	<	<	<	2.7
Cation Sum	me/L	N/A	-	-	10.70	13.90	12.90	13.10	7.81	10.40	6.6	12.0	13.5	14.2	7.2	12.2	7.2
Hardness (CaCO3)	mg/L	1	-	658	410	580	560	570	320	320	240	500	560	580	280	500	280
Ion Balance (% Difference)	%	N/A	-	-	0.50	0.70	3.70	1.10	5.28	2.44	2.44	1.07	9.25	5.24	1.58	3.48	4.04
Langelier Index (@ 20C)	N/A	N/A	-	-	0.60	0.40	0.50	0.60	0.67	0.99	0.749	1.04	0.511	0.487	0.441	0.681	0.938
Langelier Index (@ 4C)	N/A	N/A	-	-	0.40	0.20	0.30	0.30	0.42	0.74	0.5	0.787	0.264	0.24	0.193	0.434	0.69
Nitrate (N)	mg/L	0.05	10	<0.05	0.10	<	<	<	0.35	0.10	0.48	0.067	0.077	<	0.23	ND	0.4
Saturation pH (@ 20C)	N/A	N/A	-	-	6.80	6.60	6.60	6.60	7.00	6.73	7.17	6.63	6.6	6.53	7.01	6.63	6.98
Saturation pH (@ 4C)	N/A	N/A	-	-	7.00	6.80	6.80	6.80	7.25	6.98	7.42	6.87	6.85	6.78	7.26	6.88	7.22
Total Alkalinity (Total as CaCO3)	mg/L	30.00	-	587	430	540	530	510	320	420	270	510	460	530	310	490	350
Carbonaceous BOD	mg/L	5.00	20	-	-	-	-	-	<	<	-	-	<	<	<	-	<
Dissolved Chloride (Cl)	mg/L	1	-	67	40	54	48	48	32	43	29	44	38	42	26	40	27
Colour	TCU	5	-	-	17	19	15	15	12	56	10	13	12	10	12	12	12
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	25	-	-	-	-	-	<	<	-	<0.0020	<(2)	<(2)	<	-	<
Nitrate + Nitrite	mg/L	0.05	-	-	0.10	<	<	<	0.37	0.10	0.48	0.067	0.1	<	0.23	ND	0.4
Nitrite (N)	mg/L	0.01	-	<0.015	<	<	<	<	0.02	<	ND	<0.010	0.028	<	<	ND	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	2	0.43	0.40	0.50	0.50	0.50	0.12	0.26	ND	0.50	0.38	0.53	0.06	0.21	0.30
Total Organic Carbon (C)	mg/L	0.5	-	25.7	16.0	24.0	19.0	19.0	12.0	13.0	ND	20 ( 1 )	18	19(1)	7.3	13.3	10
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	ND	<0.010	<	<	<	0.016	<
pH	pH	N/A	5.5 - 9.0	6.80	7.40	7.00	7.10	7.10	7.67	7.72	7.92	7.66	7.11	7.02	7.45	7.31	7.91
Phenols-4AAP	mg/L	0.001	0.10	-	-	-	-	-	0.003	<0.01*	0.004	0.014	0.0088	0.0086	0.0015	-	0.0012
Reactive Silica (SiO2)	mg/L	0.5	-	-	19.00	17.00	17.00	18.00	14.00	14.00	19	15	15	16	13	14	13
Total Suspended Solids (TSS)	mg/L	2.0	30	69	-	34	18	16	5	33	5	24	29	28	1.2	-	12
Dissolved Sulphate (SO4)	mg/L	2.0	-	-	54	64	90	88	69	60	34	44	40	43	17	21	6.4
Sulphide	mg/L	0.02	0.50	-	-	-	-	-	<	<	ND	0.060	<	<	<	-	<
Turbidity	NTU	0.1	-	-	140.0	200.0	77.0	65.0	6.6	17.0	0.9	280	130	220	0.64	190	10
Conductivity	uS/cm	1	-	1250	980	990	1200	1100	750	900	620	1100	950	1,100	630	990	680
Total Oil & Grease	mg/L	5.00	-	-	-	-	-	-	<	<	-	-	<	<	<	-	-
Coliform-Fecal	#/100mL	-	1,000/100 mL	-	-	-	-	-	0	- <sup>(1)</sup>	-	-	-	-	-	-	-
Coliform-Total	#/100mL	-	5,000/100 mL	-	-	-	-	-	>80	- <sup>(1)</sup>	-	-	-	-	-	-	-

## Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

Coliform analysis completed by Newfoundland and Labrador Government Services in Grand Falls-Windsor, NL

\* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

PLCS = Primary Leachate Collection System

SLCS = Secondary Leachate Collection System

DUP-04= Field Duplicate of PLCS

DUP-06= Field Duplicate of SLCS

RDL = Reportable Detection Limit

0.0

= above criteria

- = Not analysed/No criteria

&lt; = Parameter below detection limit

&lt;(#)= Parameter below AMEC laboratory detection limit



TABLE D18

HISTORICAL LEACHATE ANALYTICAL (2021 - 2022) - GENERAL CHEMISTRY  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date			
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS		SLCS	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
pH	0.1	-	6.5 - 9	7.0 - 8.7	5.5 - 9.0	7.65	7.80	7.81	7.18
% Difference / Ion Balance	0.01	%	-	-	-	7.10	103	7.70	111
Alkalinity	1000	ug/L	-	-	-	505	176,000	580	434,000
Ammonia as N	5	ug/L	-	-	2,000	0.83	139	0.06	954
Anion Sum (meq/L)	0.1	me/L	-	-	-	11.30	4.14	13.40	9.82
Bicarb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	-	505	214,000	580	529,000
Calculated TDS (ug/L)	10000	ug/L	-	-	1,000,000	608	251,000	726	539,000
Carb. Alkalinity (as CaCO <sub>3</sub> )	1000	ug/L	-	-	-	<10	<1,000	<10	<1,000
Cation Sum (meq/L)	0.1	me/L	-	-	-	13	4.28	15.70	10.9
Chloride	5000	ug/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCl)	-	43	14,600	64	34,200
Cyanide	0.002	mg/L	0.025	-	0.03	<0.002	-	<0.002	-
Electrical Conductivity (uS/cm)	1	uS/cm	-	-	-	1060	399	1240	893
Fluoride	20	ug/L	120	1500	-	<0.12	93	<0.12	57
Hardness	500	ug/L	-	-	-	492	177,000	603	428,000
Hydroxide	1000	ug/L	-	-	-	<5	<1,000	<5	<1,000
Langelier Index (@20C)	0.01	NA	-	-	-	0.86	0.417	1.15	0.44
Langelier Index (@4C)	0.01	NA	-	-	-	0.54	0.168	0.83	192
Nitrate + Nitrite as N	3.2	ug/L	-	-	-	<0.05	381	<0.05	22.4
Nitrate as N	20	ug/L	13,000	200,000	10000	<0.05	381	<0.05	<20
Nitrite as N	10	ug/L	60	-	-	<0.05	<10	<0.05	<10
Ortho-Phosphates as P	1	ug/L	-	-	-	0.05	1.6	<0.01	<1.0
Phenols	0.001	ug/L	4	-	0.1	0.014	-	0.02	-
Reactive Silica as SiO <sub>2</sub>	0.5	mg/L	-	-	-	10.8	-	4.5	-
Saturation pH (@20C)	0.01	NA	-	-	-	6.79	7.38	6.66	6.74
Saturation pH (@4C)	0.01	NA	-	-	-	7.11	7.63	6.98	6.99
Sulphate	300	ug/L	128,000	-	-	<2	8,690	2	8,460
Sulphide	0.1	mg/L	-	-	0.5	<0.05	-	<0.05	-
Total Organic Carbon	0.5	mg/L	-	-	-	38.8	-	34.3	-
True Color (CU)	2	TCU	-	-	-	10.9	60.7	6.42	1,100
Turbidity (NTU)	0.1	NTU	-	-	-	586	0.55	432	206

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

<u>Value</u>	Exceeds Fresh Water and Marine criteria reference below.
<b>Value</b>	Exceeds <b>Fresh Water</b> or <b>Marine</b> criteria reference below.
<u>Value</u>	Exceeds NL 65/03 Schedule A Regulations.
<b>Value</b>	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.

TABLE D19

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - TOTAL METALS (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	PLCS												
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08	Dec 08, 2015	Oct 12, 2017
Aluminum (Al)	5	-	35	<	<	36.8	<	41	14.2	22.2	18	-	-	45.0	42
Antimony (Sb)	1	-	<	<	<	<	<	-	<	<	<	-	-	<	<
Arsenic (As)	1	500	<	<	<	<	<	-	<	1.0	<	-	-	<	<
Barium (Ba)	1	5,000	7.0	73	71	13.3	51	11	72.7	85.7	85	13.0	13	84.0	17
Beryllium (Be)	1	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Bismuth (Bi)	2	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Boron (B)	5	5,000	170	7,400	3,400	1,170	2,230	650	1,500	1,890	1,700	200	210	2,700	370
Cadmium (Cd)	0.017	50	<	<	<	<	<	-	<	<	0.012	<	<	<	0.015
Calcium (Ca)	100	-	-	-	-	58,400	138,000	46,100	140,000	159,000	-	41,000	42,000	140,000	50,000
Total Chromium (Cr)	1	1,000	<	<	<	<	<	-	<	<	<	<	<	<	<
Chromium VI	0.001	0.05	-	-	-	<	<	-	-	<	0.58	-	<	-	<
Cobalt (Co)	0.4	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Copper (Cu)	2	300	4.0	<	<	2.50	<	2	<	<	<	<	<	<	4.00
Iron (Fe)	50	10,000	77	4,900	4,000	1,790	3,150	342	5,470	14,300	12,000	62	150	11,000.00	350
Lead (Pb)	5	200	<	<	<	<	<	-	<	<	<	<	<	<	<
Magnesium (Mg)	100	-	-	-	-	10,700	24,300	7,070	28,800	32,900	23,000	4,100	4,200	28,000	4,100
Manganese (Mn)	2	-	7.0	9,100	8,800	1,130	6,240	369	7,270	8,770	5,700	65	67	6,400	61
Mercury (Hg)	0.013	5	-	-	<	<	<	-	-	<	<	<	<	-	<
Molybdenum (Mo)	2	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Nickel (Ni)	2	500	<	<	<	<	<	-	<	<	<	<	<	<	<
Phosphorus (P)	100	-	-	-	-	<	<	-	<	<	<	<	110.00	<	<
Potassium (K)	100	-	-	-	-	7,270	6,530	21,000	5,840	5,800	6,100	13,000	13,000	6,500.00	17,000
Selenium (Se)	1	10	<	<	<	<	<	-	<	<	<	<	<	<	<
Silver (Ag)	0.1	50	-	-	-	<	<	-	<	<	<	<	<	<	<
Sodium (Na)	100	-	<	<	<	9,880	22,500	14,300	21,100	23,700	19,000	11,000	11,000	25,000.00	12,000
Strontium (Sr)	2	-	52	360	350	156	289	104	318	362	300	90	93	350.00	110
Thallium (Tl)	0.1	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Tin (Sn)	2	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Titanium (Ti)	2	-	<	<	<	<	<	-	<	2.00	<	2.30	4.50	<	2.10
Uranium (U)	1	-	0.1	<	<	0.25	<	0	0.79	0.94	0.66	0.19	0.21	0.96	0.23
Vanadium (V)	2	-	<	<	<	<	<	-	<	<	<	<	<	<	<
Zinc (Zn)	50	500	<	67.0	<	8.10	<	14	<	6.50	<	<	<	5.80	8.20

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.  
 PLCS = Primary Leachate Collection System  
 SLCS = Secondary Leachate Collection System  
 DUP-04 = Field Duplicate of PLCS  
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 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit  
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TABLE D19

HISTORICAL LEACHATE ANALYTICAL (2008 - 2017) - TOTAL METALS (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

Parameter	RDL	Criteria*	SLCS													
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014	Dec 08, 2015	Oct 12, 2017
Aluminum (Al)	5	-	42	<	100	<	<	23.1	<	23.7	16.3	22	28	-	17	17
Antimony (Sb)	1	-	<1	<	<	<	<	<	<	-	<	<	<	-	ND	<
Arsenic (As)	1	500	2	<	<	<	<	<	<	-	1.1	<	1.1	-	ND	<
Barium (Ba)	1	5,000	69.8	38	93	68	68	18.9	40	5.3	78.2	98	110	13	95	31
Beryllium (Be)	1	-	<0.1	<	<	<	<	<	<	-	<	<	<	<	ND	<
Bismuth (Bi)	2	-	1.1	<	<	<	<	<	<	-	<	<	<	<	ND	<
Boron (B)	5	5,000	-	2,800	3,100	2,300	2,400	1,970	1,870	1,350	2,500	2,300	2,400	1,200	2,600	1,300
Cadmium (Cd)	0.017	50	1.3	<	<	<	<	<	<	-	<	<	<	<	ND	<
Calcium (Ca)	100	-	-	-	-	-	-	90,900	135,000	69,700	147,000	170,000	180,000	87,000	150,000	87,000
Total Chromium (Cr)	1	1,000	1	<	<	<	<	<	<	63.2	<	<	<	<	ND	<
Chromium VI	0.001	0.05	-	-	-	-	-	<	<	-	-	<	<	-	-	<
Cobalt (Co)	0.4	-	<1	<	<	<	<	0.49	<	-	1.04	0.61	0.47	<	ND	0.72
Copper (Cu)	2	300	1	<	<	<	<	<	<	-	<	<	<	<	ND	<
Iron (Fe)	50	10,000	<b>29,900</b>	6,800	<b>19,000</b>	8,500	8,300	1,320	2,240	-	<b>15,100</b>	<b>22,000</b>	<b>27,000</b>	130	<b>22,000</b>	2,700
Lead (Pb)	5	200	6	<	<	<	<	<	<	-	<	<	<	<	ND	<
Magnesium (Mg)	100	-	-	-	-	-	-	23,500	27,400	16,900	33,200	34,000	35,000	16,000	30,000	16,000
Manganese (Mn)	2	-	11,000	5,400	10,000	8,900	9,000	3,270	5,120	241	8,250	9,300	9,500	850	7,300	5,200
Mercury (Hg)	0.013	5	-	-	-	<	<	<	<	-	-	<	<	<	<	<
Molybdenum (Mo)	2	-	2	<	<	<	<	<	<	-	7.20	<	<	<	2.90	<
Nickel (Ni)	2	500	1	<	<	<	<	<	<	-	2.40	<	<	<	ND	2.20
Phosphorus (P)	100	-	-	-	-	-	-	<	<	-	<	<	<	<	ND	<
Potassium (K)	100	-	-	-	-	-	-	<	7,750	28,400	8,870	9,100	10,000	22,000	11,000	24,000
Selenium (Se)	1	10	1	<	<	<	<	<	<	-	<	<	<	<	ND	<
Silver (Ag)	0.1	50	-	-	-	-	-	<	<	-	<	<	<	<	ND	<
Sodium (Na)	100	-	0.6	<	<	<	<	21,300	25,500	23,100	26,600	26,000	28,000	21,000	27,000	20,000
Strontium (Sr)	2	-	-	280	440	380	390	282	324	183	369	430	450	220	380	230
Thallium (Tl)	0.1	-	-	<	<	<	<	<	<	-	<	<	<	<	ND	<
Tin (Sn)	2	-	-	<	<	<	<	<	<	-	<	<	<	<	ND	<
Titanium (Ti)	2	-	-	<	<	<	<	<	<	-	<	<	2.5	<	ND	<
Uranium (U)	1	-	-	0.8	1	2	2	1.11	1	0.71	5.05	1.2	1.1	0.7	3.1	1.1
Vanadium (V)	2	-	4	<	<	<	<	<	<	-	<	<	<	<	ND	<
Zinc (Zn)	50	500	7	<	<	<	<	5.20	<	32.2	8.30	16	180	<	5	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.  
 \* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.  
 PLCS = Primary Leachate Collection System  
 SLCS = Secondary Leachate Collection System  
 DUP-04 = Field Duplicate of PLCS  
 DUP-06 = Field Duplicate of SLCS  
 RDL = Reportable Detection Limit                      -- Not analysed/No criteria  
 < = Parameter below detection limit  
 <(#) = Parameter below AMEC laboratory detection limit  
 0.0 = above criteria

TABLE D19

HISTORICAL LEACHATE ANALYTICAL (2021 - 2022) - TOTAL METALS (ug/L)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
 COME BY CHANCE SECURE LANDFILL  
 COME BY CHANCE, NL

PARAMETER	RDL	UNITS	RBCA Ecological Tier I EQS		NL Regulation 65/03 - Schedule A <sup>3</sup>	Sample ID & Date			
			Fresh Water <sup>1</sup>	Marine Water <sup>2</sup>		PLCS		SLCS	
						8-Dec-21	21-Dec-22	8-Dec-21	21-Dec-22
Aluminum	30	ug/L	5	-	-	39.1	18.9	26.6	<30
Antimony	0.10	ug/L	9	250	-	<3.0	<0.10	<3.0	<1.0
Arsenic	0.10	ug/L	5	12.5	500	<3.0	0.20	<3.0	<1.0
Barium	0.10	ug/L	1000	500	5,000	180	43.1	138.0	110
Beryllium	0.020	ug/L	0.15	100	-	<0.50	<0.02	<0.50	<0.20
Bismuth	0.050	ug/L	-	-	-	<2.0	<0.05	<2.0	<0.50
Boron	10	ug/L	1,500	1,200	5,000	3679	530	2432	1620
Cadmium	0.005	ug/L	0.09	0.12	50	<0.10	<0.005	<0.10	<0.04
Calcium	100	ug/L	-	-	-	148	60,300	176	126,000
Cesium	0.01	ug/L	-	-	-	-	0.050	-	0.113
Chromium (total)	0.50	ug/L	8.9	56	50	<3.0	0.59	<3.0	<2.5
Cobalt	0.10	ug/L	1	4	-	<0.50	<0.10	<0.50	<1.0
Copper	0.50	ug/L	2	1	300	<1.0	1.69	<1.0	<2.0
Iron	10.00	ug/L	300	-	10,000	38,500	360	33,200	22,100
Lead	0.05	ug/L	1	2	200	<1.0	<0.050	<1.0	<0.50
Lithium	1.00	ug/L	-	-	-	-	<1.0	-	<10
Magnesium	0.10	ug/L	-	-	-	29.7	6,530	39.8	27,600
Manganese	0.10	ug/L	430	-	-	8,330	188	7,680	7,280
Mercury	0.01	ug/L	0.026	0.016	-	-	<0.005	-	0.005
Molybdenum	0.50	ug/L	73	1000	-	3.6	0.562	<2.0	<0.50
Nickel	5	ug/L	25	8.3	500	<3.0	0.55	<3.0	<5.0
Phosphorus	50	ug/L	-	-	0.5	<0.10	<50	<0.10	<500
Potassium	50	ug/L	-	-	-	6.4	5,150	13.5	7,470
Rubidium	0.20	ug/L	-	-	-	-	7.9	-	15.3
Selenium	0.50	ug/L	1	2	10	4.7	0.053	1.7	<0.50
Silicon (as SiO <sub>2</sub> )	250	ug/L	-	-	-	-	9,560	-	15,600
Silicon	100	ug/L	-	-	-	-	4,470	-	7,310
Silver	0.01	ug/L	0.25	1.5	50	0.18	<0.01	0.12	<0.10
Sodium	50	ug/L	-	-	-	30	13,100	41.3	24,700
Strontium	0.20	ug/L	21,000	-	-	429	160	586	375
Sulfur	500	ug/L	-	-	-	-	3,100	-	<5.0
Tellurium	0.20	ug/L	-	-	-	-	<0.20	-	<2.0
Thallium	0.01	ug/L	0.8	0.3	-	<0.30	<0.01	<0.30	<0.10
Thorium	0.10	ug/L	-	-	-	-	<0.10	-	<1.0
Tin	0.10	ug/L	-	-	-	<2.0	0.11	<2.0	<1.0
Titanium	0.30	ug/L	-	-	-	<10.0	0.57	<10.0	<3.0
Tungsten	0.10	ug/L	-	-	-	-	<0.10	-	<1.0
Uranium	0.01	ug/L	15	8.5	-	<0.50	0.196	0.88	0.331
Vanadium	0.50	ug/L	120	5	-	<2.0	<0.50	<2.0	<5.0
Zinc	3	ug/L	7	10	500	<20	<3.0	<20	<7.0
Zirconium	0.20	ug/L	-	-	-	-	<0.20	-	<2.0

Notes:

1,2 Atlantic RBCA Ecological Tier I Environmental Quality Standards (EQSs) for Surface Water, Discharge to Fresh Water and/or Marine Water (July 2021, updated July 2022).

<sup>3</sup> Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations (2003) under the Water Resources Act (O.C. 2003-231), Schedule A (discharge into a body of water).

NG = For Tier I EQS, Health Canada AO and OG values are excluded from consideration, as such No Guideline (NG) is indicated.

- = No applicable guideline or parameter not defined.

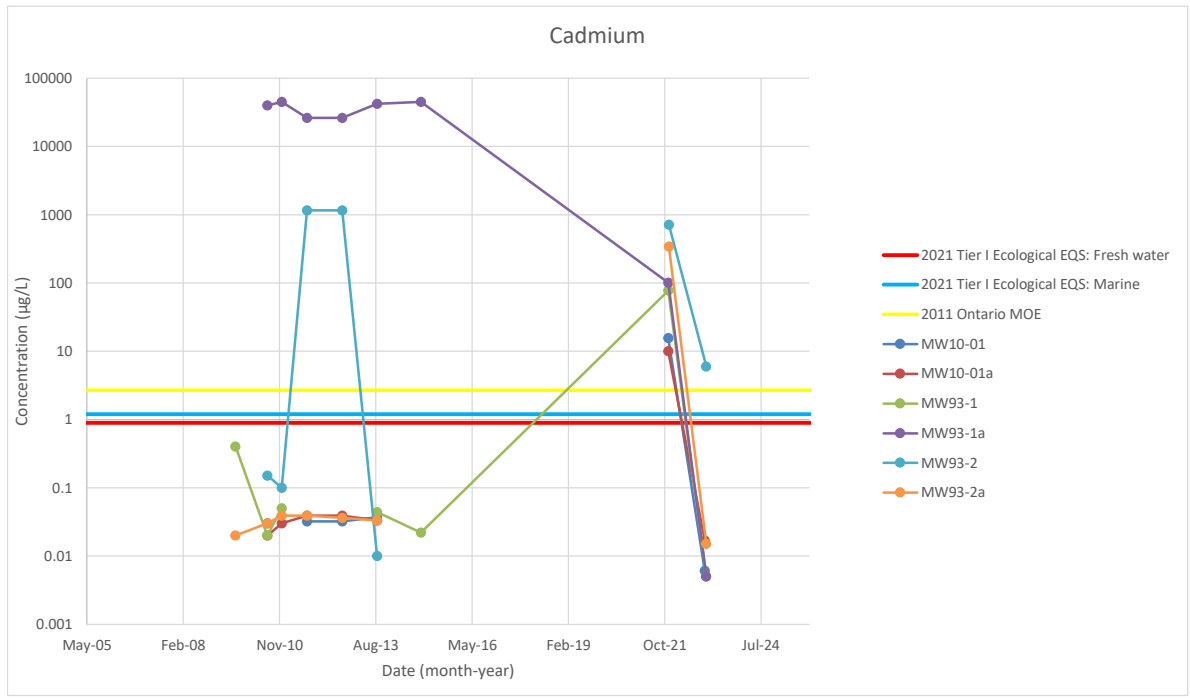
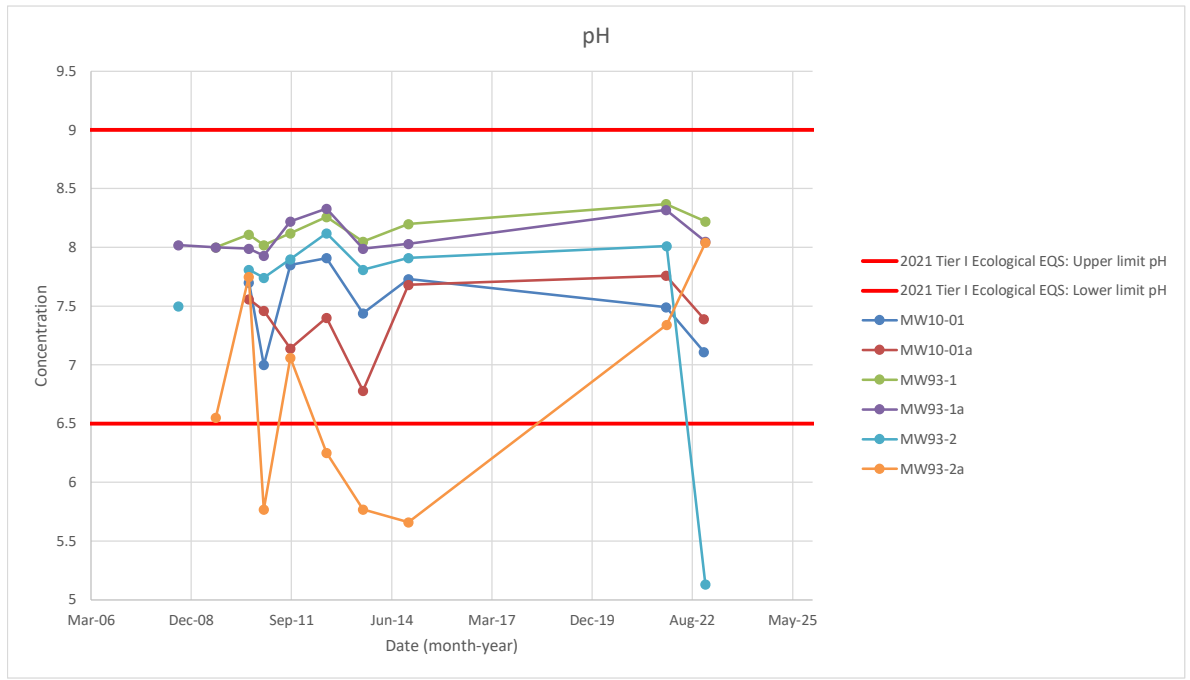
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Value	Exceeds Fresh Water or Marine criteria reference below.
Value	Exceeds NL 65/03 Schedule A Regulations.
Value	Exceeds Fresh Water and Marine criteria and NL 65/03 Schedule A Regulations reference below.

# Appendix F

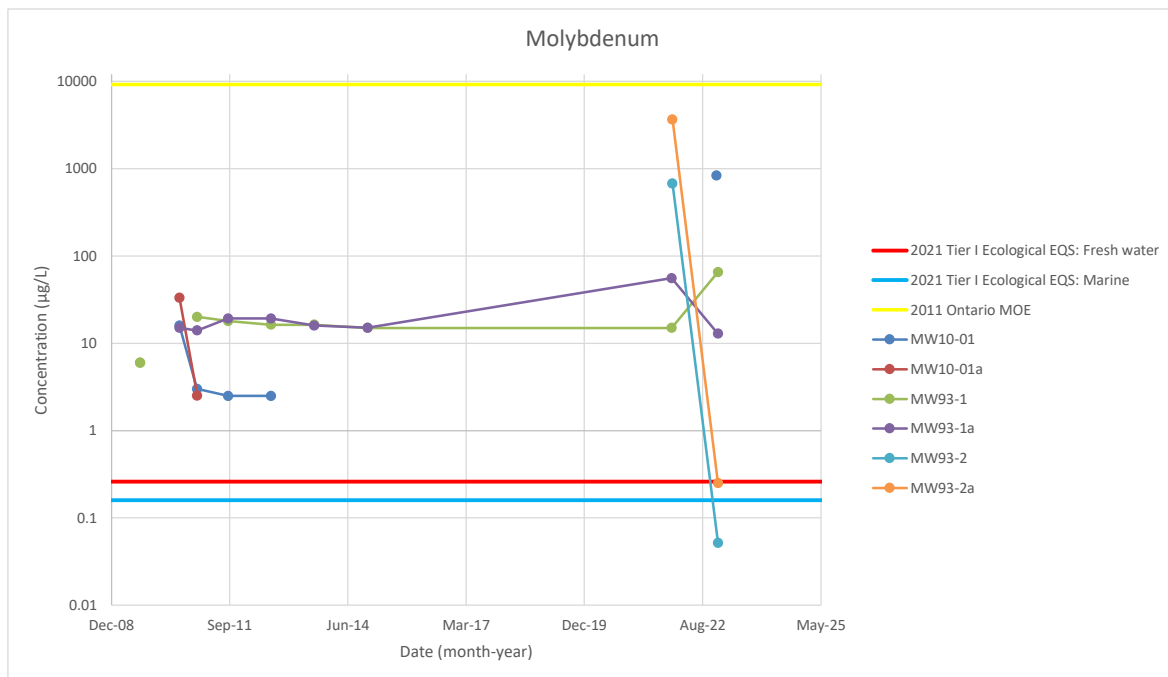
## Analytical Trend Graphs



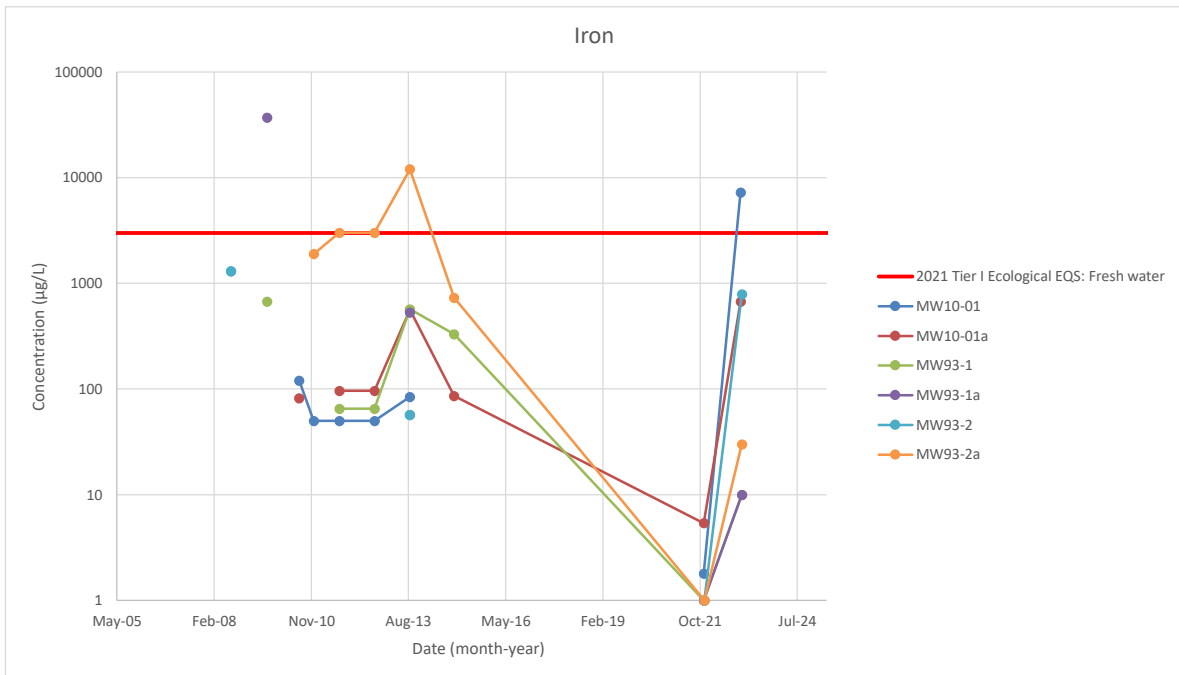
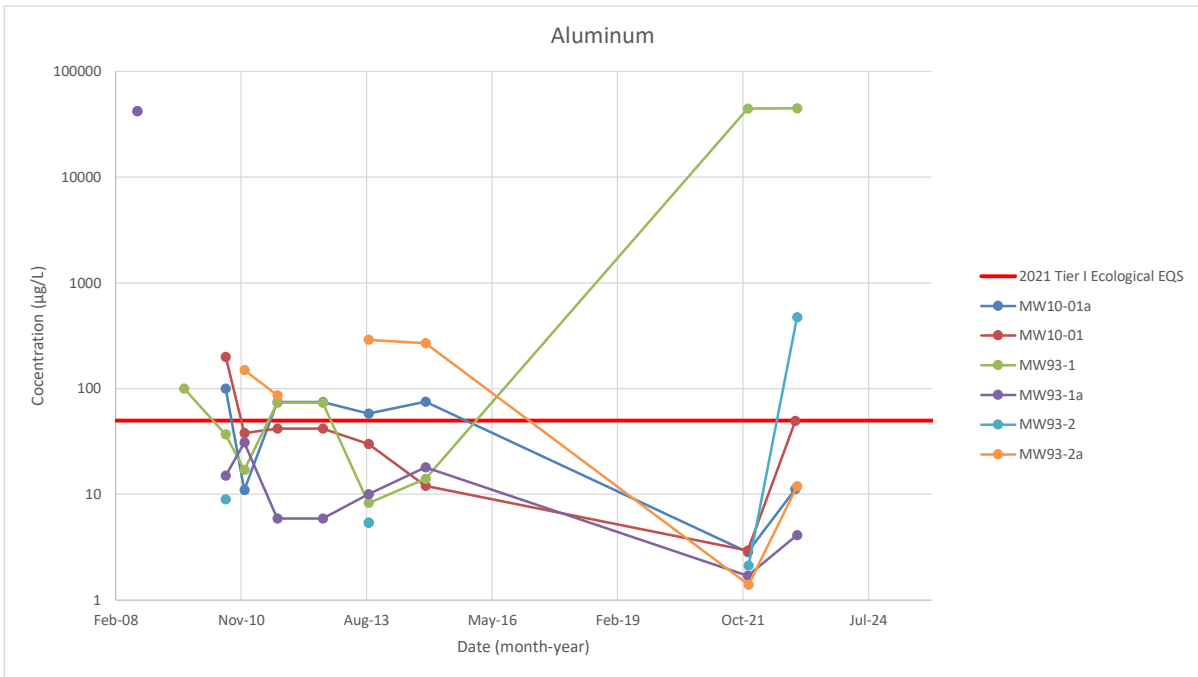
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2022/23 MONITORING AND MAINTENANCE PROGRAM  
COME BY CHANCE HAZARDOUS WASTE LANDFILL  
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HISTORICAL GROUNDWATER TRENDS DATA - METALS (2009 - 2023)  
 2022/23 MONITORING AND MAINTENANCE PROGRAM  
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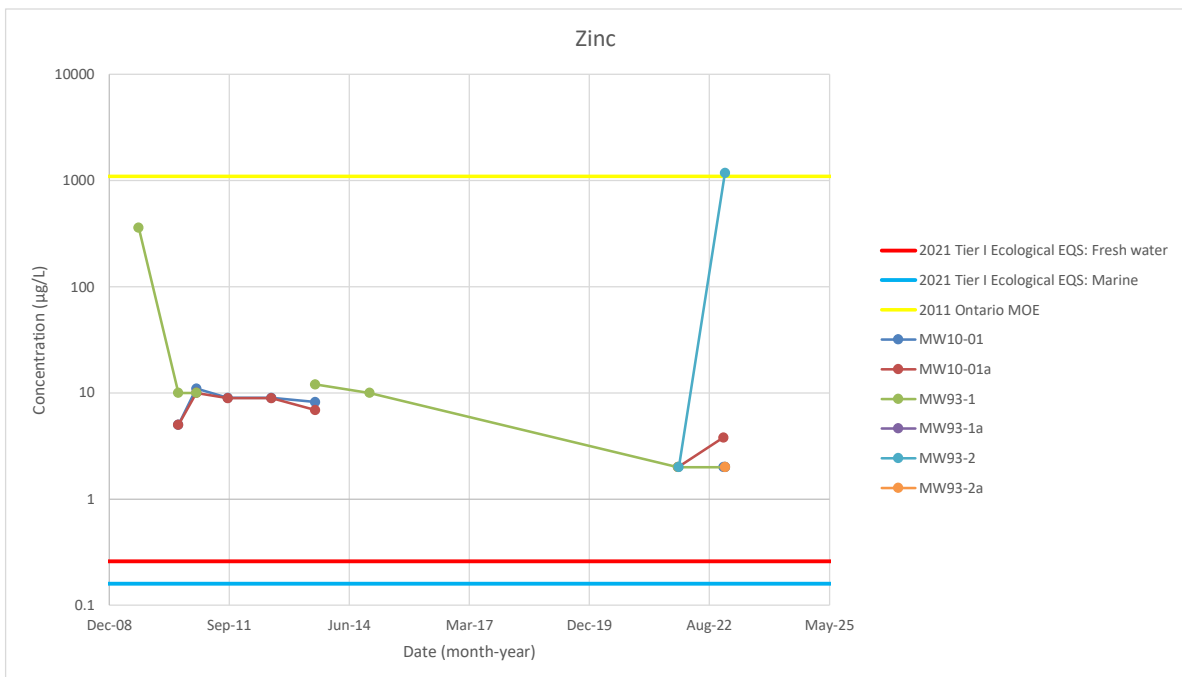


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 2022/23 MONITORING AND MAINTENANCE PROGRAM  
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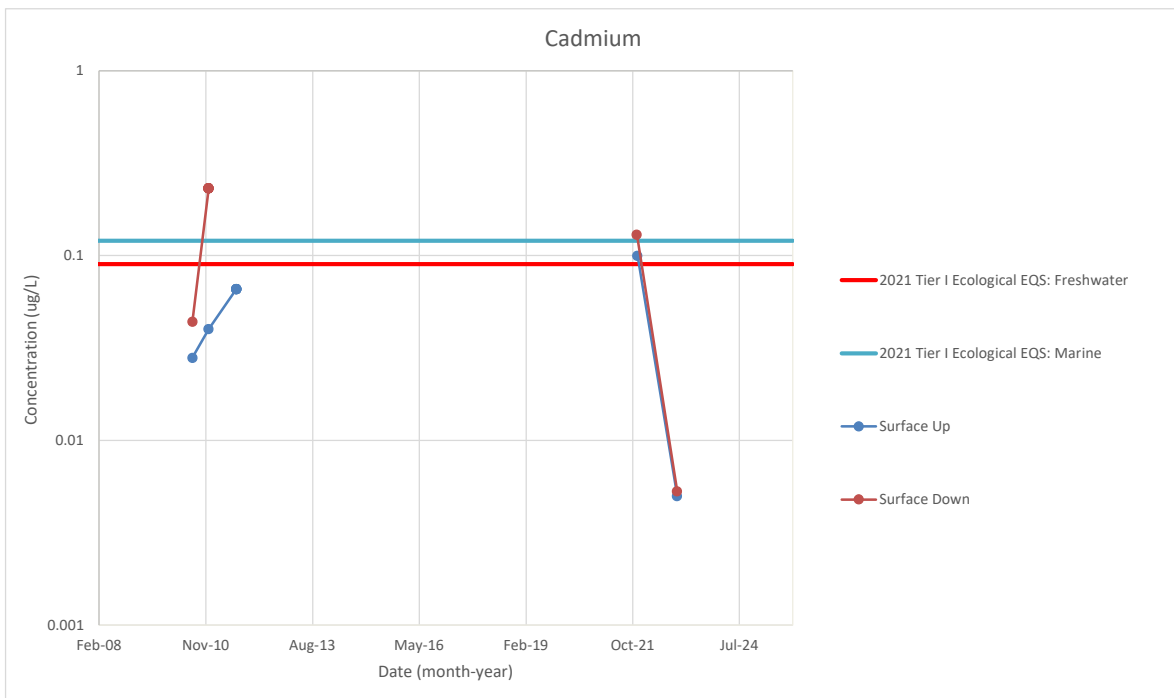
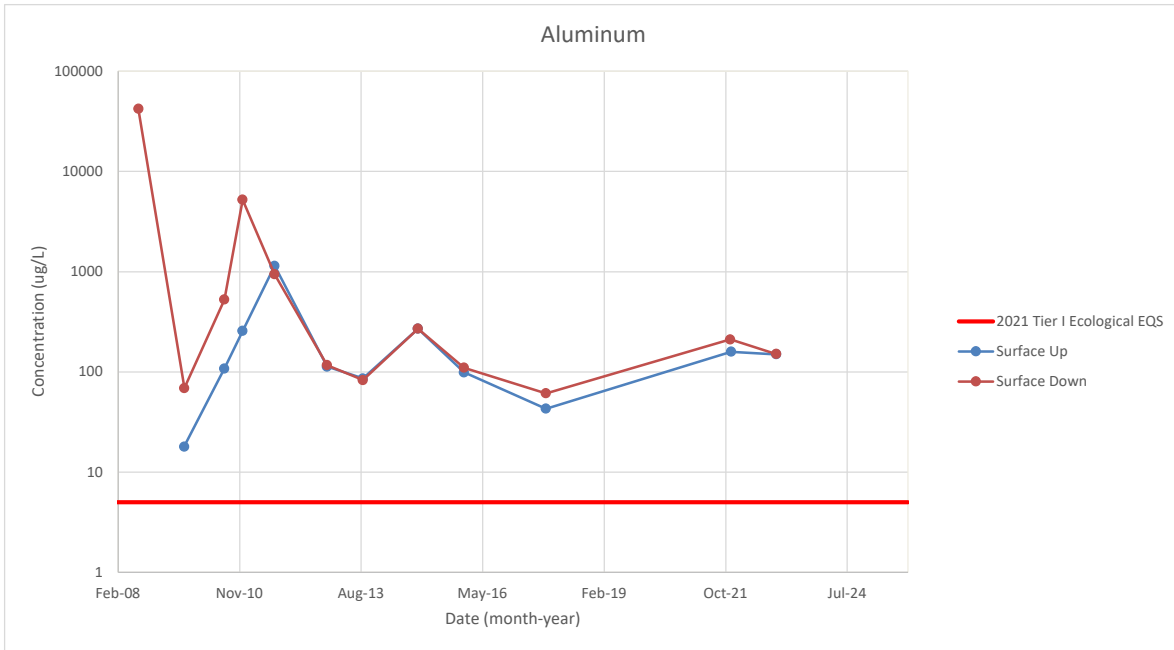




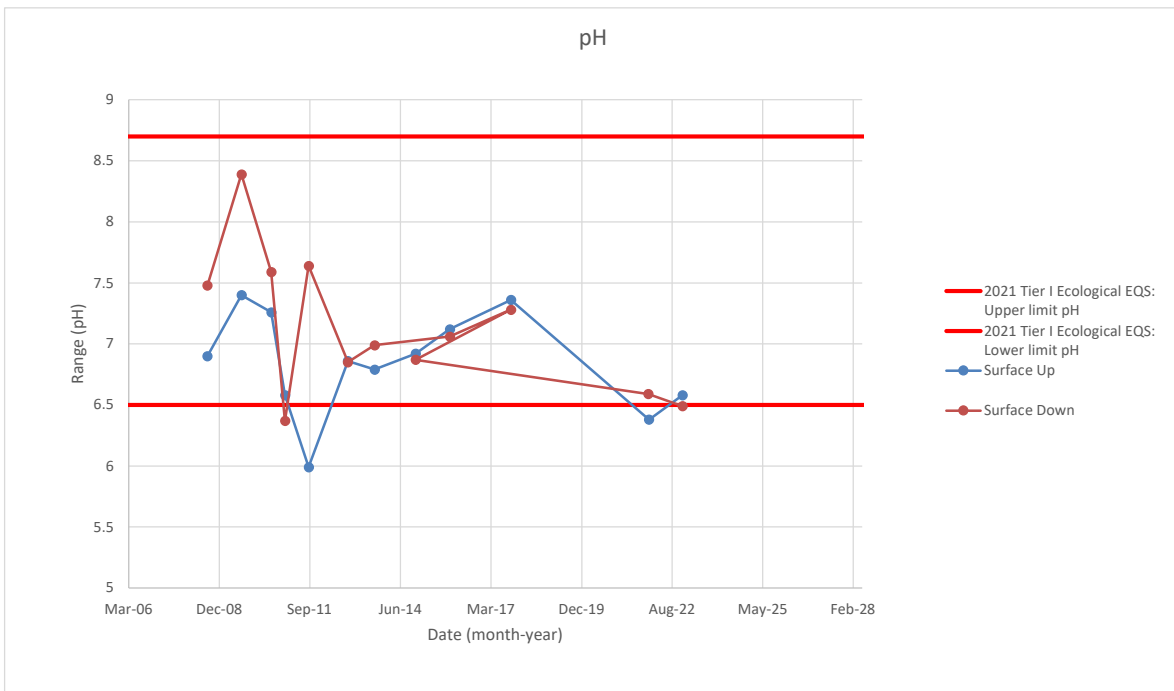
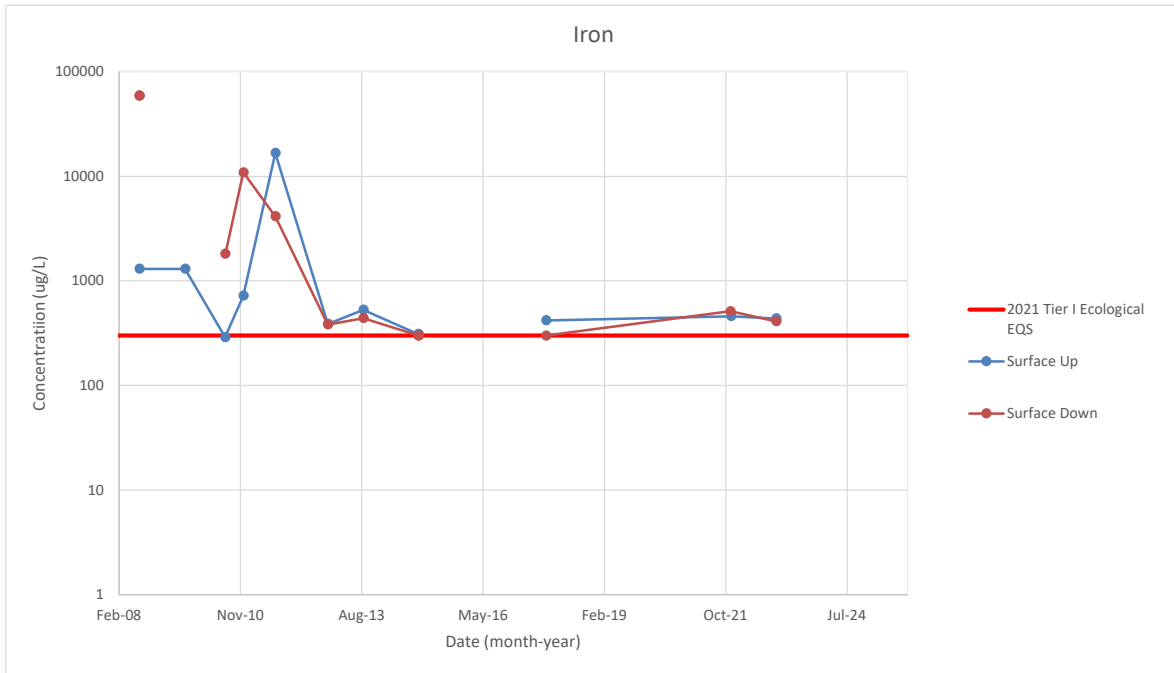
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2022/23 MONITORING AND MAINTENANCE PROGRAM  
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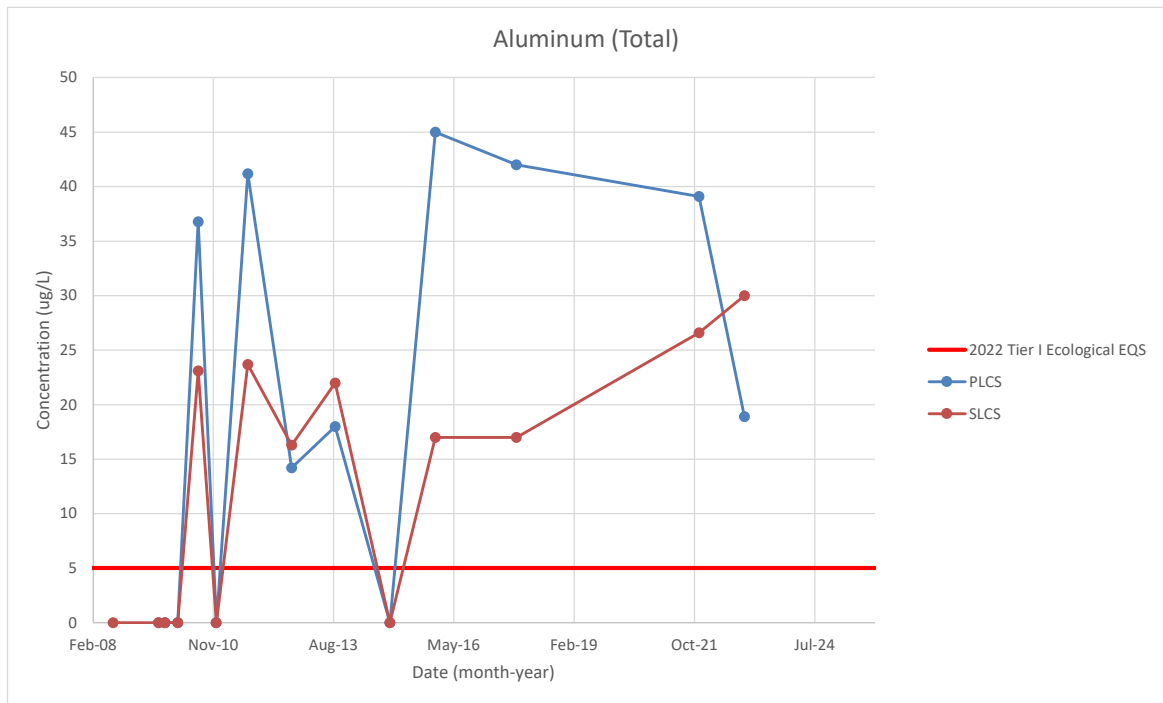
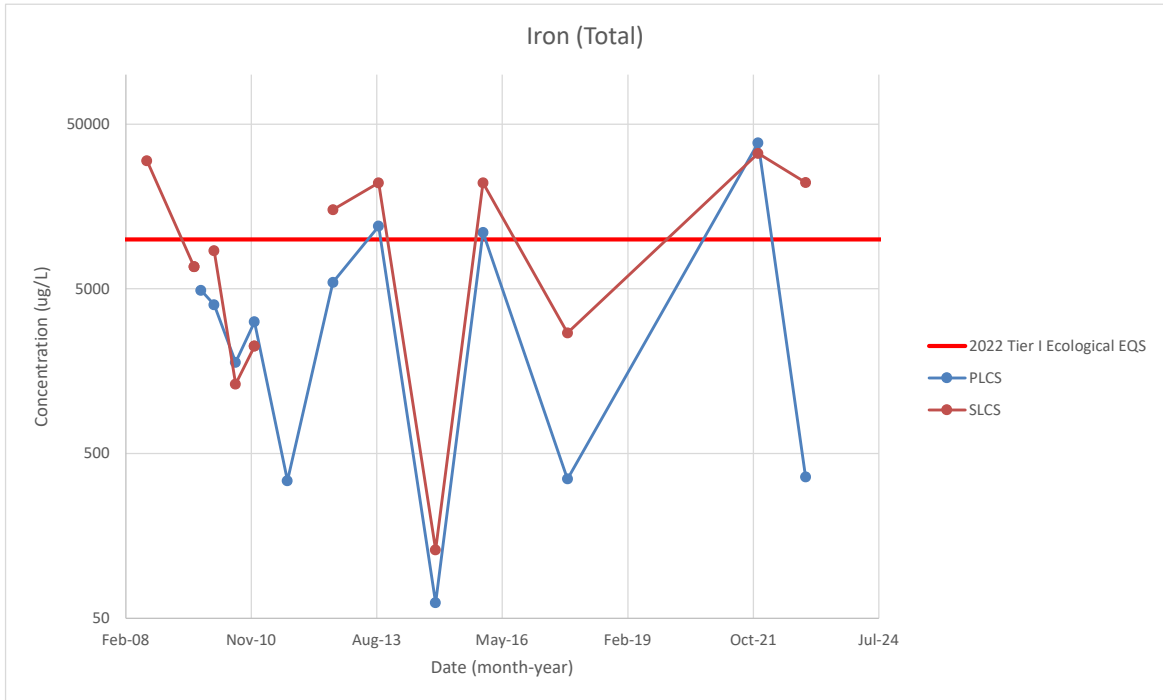
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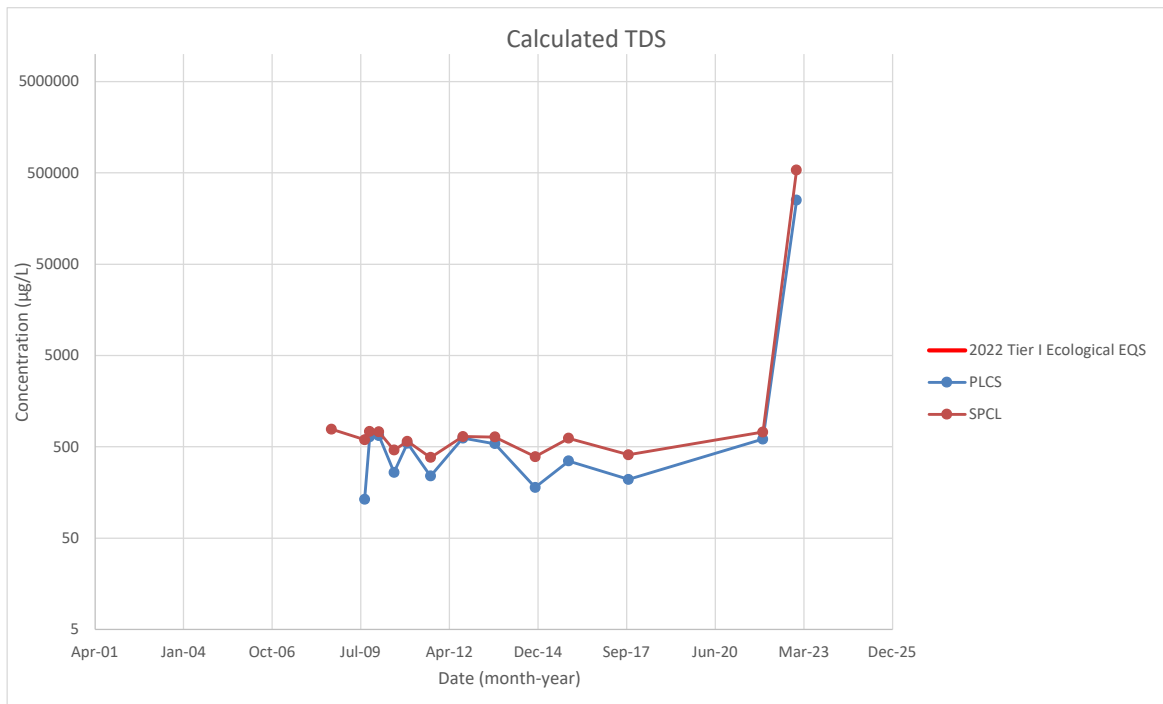
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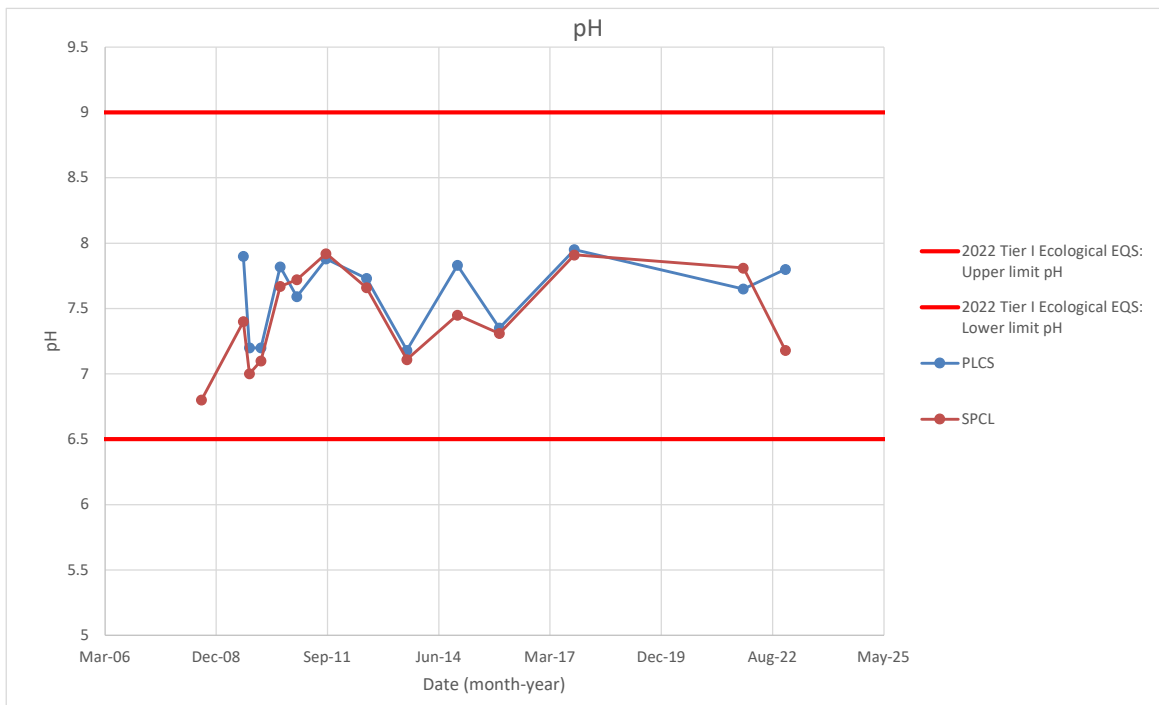
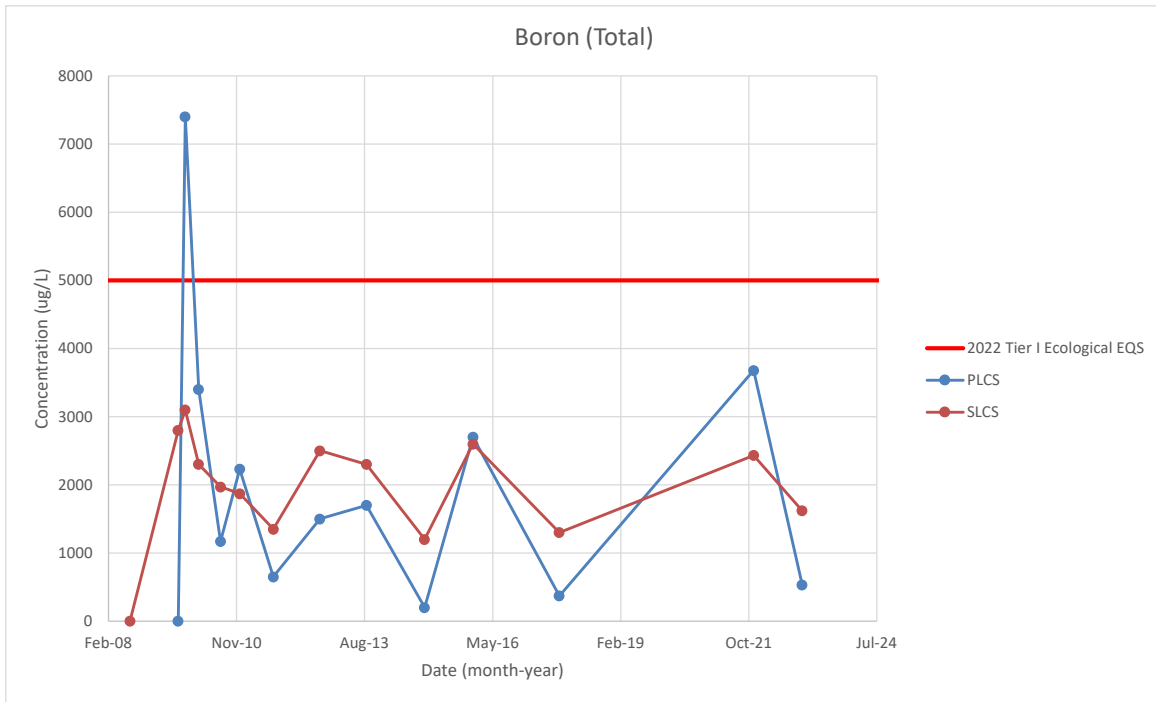
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 2022/23 MONITORING AND MAINTENANCE PROGRAM  
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