2018 Site Remedial Activities Supervision and Environmental Monitoring Program – Cambridge Bay Airport, Apron Land Treatment Unit and Excavation Area

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Prepared for:

Public Services and Procurement Canada
for Transport Canada

Prepared by:

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Sign-off Sheet

This document entitled 2018 Site Remedial Activities Supervision and Environmental Monitoring Program – Cambridge Bay Airport, Apron Land Treatment Unit and Excavation Area and Excavation Area was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Public Services and Procurement Canada for Transport Canada (the "Client").

2019/01/25

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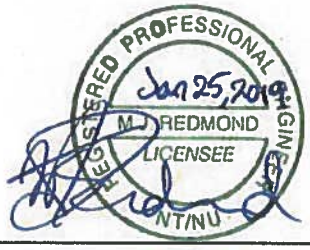

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Executive Summary

Stantec Consulting Ltd. (Stantec) completed the 2018 Site Remedial Activities Supervision and Environmental Monitoring Program (the Program) at the Apron Land Treatment Unit (LTU) and Excavation Area located at the south west portion of the Cambridge Bay Airport in Cambridge Bay, Victoria Island, Nunavut. The LTU is approximately 55 metres (m) x 148 m in dimension and contains approximately 3,500 cubic metres (m^3) of impacted soil. The field program was conducted between August 8 to 13, 2018. The Program was completed with the authorization of Public Services and Procurement Canada (PSPC) on behalf of Transport Canada (TC).

The remedial activities consisted of tilling and aerating the impacted soil in the Apron LTU to increase water absorption and conducting dewatering activities. The environmental monitoring program consisted of collecting soil and groundwater samples to satisfy the Nunavut Water Board (NWB) licence requirements (Licence No. 1BR-FTA1828). Only one soil sampling event was conducted as no active soil treatment is currently occurring at the LTU. Only three of the nine groundwater monitoring wells could be located or accessed and contained sufficient groundwater to allow for sampling. Two of these monitoring well locations were located at the excavated Apron area, and one at the Apron LTU.

Remedial Activities Supervision

Aeration of the LTU was conducted on August 12 and 13, 2018 by Kitnuna of Cambridge Bay, NU (Kitnuna), a subcontractor engaged by Stantec. Aeration was completed using a dozer with a disk harrow attachment to till the soil. The disk harrow attachment was dragged by the dozer across the surface of the LTU in a circular pattern three times to potentially increase water absorption.

Upon completion of soil sampling, Kitnuna pumped approximately 70 m^3 of accumulated water from Apron LTU sump onto the soil contained within the Apron LTU between August 15 and 17, 2018.

Environmental Monitoring

Three of the nine existing groundwater monitoring wells (MW13-1 located immediately west and hydraulically cross-gradient of the Apron LTU, MW13-7 located immediately east and hydraulically cross-gradient of the former Apron Excavation Area, and MW13-9 located immediately south and hydraulically cross-gradient of the former Apron Excavation Area) contained sufficient water to allow for sampling. The remaining wells were frozen, damaged, or could not be located and were assumed to be destroyed. The collected samples were analyzed for dissolved total metals, routine parameters, polycyclic aromatic hydrocarbons (PAHS), PFAS, oil and grease, phenols, petroleum hydrocarbons (PHCs) and PHC fractions F1-F2. (Part J, Item 7 of the licence).

The depth to water ranged from 0.515 metres below top of casing (mBTOC) in MW13-7 to 1.914 mBTOC in MW13-1, and the depth to ice in the frozen wells ranged from 2.215 mBTOC in MW13-5 to 2.415 mBTOC in MW13-3.

The laboratory reported concentrations of the parameters analyzed satisfied the applicable and referenced guidelines with the exception of the parameters summarized in Table A:

Table A Summary of Parameter Concentrations Exceeding Applicable Guidelines

Monitoring Well	Parameter Category	Individual Parameter	Applicable Guideline Exceeded
MW13-1	Total Metals	Aluminum, iron	CWQG Aluminum: 1.2 times applicable, within same order of magnitude. Iron: One order of magnitude greater than the applicable guideline.
	Routine	Dissolved chloride	CWQG 2.75 times the applicable guideline, within same order of magnitude
MW13-7	Total Metals	Copper, iron, uranium	CWQG Copper: 1.7 times the applicable guideline, within same order of magnitude. Iron: 1.9 times the applicable guideline, within same order of magnitude. Uranium: 2 times the applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride	CWQG 6.75 times the applicable guideline, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 2.3 times applicable guideline, within same order of magnitude.
MW13-9	Total Metals	Boron, iron, uranium	CWQG Boron: 1.3 times applicable guideline, within same order of magnitude. Iron: 36 times applicable guideline, 2 orders of magnitude greater. Uranium: 3.9 times applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride, dissolved sodium	CWQG, MECP Chloride: 3 orders of magnitude greater than CWQG, 1 order of magnitude greater than MECP. Sodium: 1.61 times MECP, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 3.2 times applicable guideline, within same order of magnitude.

Soil samples were collected from a depth of approximately 0.0-0.3 m below ground surface (BGS) within the FTA LTU. Six soil samples and one field duplicate were collected and analyzed for PHC, including BTEX and PHC fractions F1-F4, and lead as required by the NWB Licence in Part J, Table 1. TC confirmed that analysis for PCBs, which is also listed in the NWB Licence in Part J, Table 1, was not required. The reported BTEX and PHC F1-F4 soil concentrations were below the laboratory detection limit in the submitted soil samples, with the exception of F2 (APR-S01, S03, S04, and S06), F3 (in the 6 soil samples), and F4 (APR-S03 to S05). The laboratory analytical results

indicated that the reported concentrations of the parameters analyzed were below the applicable and the referenced guidelines.

Quality Assurance / Quality Control (QA/QC)

The data quality objective (DQO) of the Program was to collect data that were reproducible, complete, and suitable for comparison with the referenced guidelines. In general, based on the results of the QA/QC analysis, the DQO for the Program was considered to have been met.

Limitations

The statements made in the Executive Summary are subject to the same limitations included in the Limitations Section 7.0 and are to be read in conjunction with the remainder of this report.

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) completed the 2018 Site Remedial Activities supervision and Environmental Monitoring Program (the Program) at the Apron Land Treatment Unit (LTU) and Excavation Area located at the Cambridge Bay Airport in Cambridge Bay, Victoria Island, Nunavut. The Program was completed under the authorization of Public Services and Procurement Canada (PSPC) on behalf of Transport Canada (TC).

The Site location is presented in Figure 1 of **Appendix A.**

1.1 OBJECTIVES

The objectives of the Program were as follows:

- Complete an environmental monitoring program to satisfy the Nunavut Water Board (NWB) licence requirements (Licence No. 1BR-FTA1828)
- Modify soil sampling requirements to one sampling event as no active soil treatment is occurring
- Till / aerate the FTA LTU to increase water absorption
- Conduct dewatering activities

1.2 BACKGROUND

Stantec reviewed the Arcadis Canada Inc. (Arcadis) Draft 2018 Environmental Monitoring Program at Cambridge Bay Airport LTU report (December 1, 2018) prior to the Program. The Arcadis report indicated that a fuel transfer building was demolished and associated contaminated soil was excavated from the Apron of the Cambridge Bay Airport (Apron Excavation Area) in 2013.

The Apron LTU was constructed in 2013 and covers an area of approximately 55 m x 148 m the southwest corner of the airport property. The Apron Excavation Area is located within the operating area of the airport and consists of a 0.5 m high berm and a geomembrane liner.

In 2013, approximately 3,500 cubic metres (m^3) of petroleum hydrocarbon (PHC) and metals impacted soil was excavated from the Apron Excavation Area and transferred to the Apron LTU for treatment.

During the construction of the adjacent fire training area (FTA) LTU in 2014, a drum cache was discovered within the FTA LTU footprint. Approximately 560 m^3 of impacted soil originating from the drum cache was stored in the Apron LTU. The material from the drum cache was suspected to contain poly- and perfluoroalkyl substances (PFAS).

In 2015, nutrients were added to the soil in the Apron LTU to facilitate remediation, and in 2017, approximately 290 m^3 of impacted material was transferred from the Apron LTU to the FTA LTU.

Sump water in the Apron LTU has been identified as containing PFAS and PHC compounds; therefore, sump water in the Apron LTU cannot be discharged to the environment and must be recirculated over the LTU.

Ongoing monitoring of the soil and water associated with the Apron LTU and the water associated with the Apron Excavation Area is required per the Nunavut Water Board (NBW) Licence No. 1BR-FTA1828.

The Site layout and monitoring well locations are shown on Figures 2 and 3, **Appendix A**.

1.3 SCOPE OF WORK

The scope of work of the Program is outlined in the sections below.

1.3.1 Task 1 – Health and Safety

- Prepare a site-specific health and safety plan to identify and address site specific hazards

1.3.2 Task 2 – Remedial Activities Supervision

- Engage, manage, administer, and provide review of the work carried out by a contractor to till / aerate the Apron LTU, to dewater the sumps, and to discharge the sump water onto the Apron LTU
  - Provision quality control to mitigate potential damage to the LTU
- Report on site activities and work done in compliance with regulatory licenses
- Review available project documentation, drawings, licenses, permits, and other supporting documents to become familiar with the goals of the project and allow for a good working knowledge of the site and issues that pertain to the site in the context of completing the remedial work
- Provide consultant on-site supervision services for the duration of key components of the remedial work
- Submit daily field reports to the PSPC Project Manager and the TC Project Manager during field activities
- Preside over the onsite meetings
- Review, track, and provide feedback on the project schedule
- Manage / coordinate the transportation to the respective testing facilities of samples collected
- Prepare a report upon completion of the work completed

1.3.3 Task 3 – Environmental Monitoring

- Upon completion of the tilling /aeration of the LTU by a third-party, and prior to sump de-watering, divide the LTU into six sections and collect six soil samples and one field duplicate sample using hand tools from the top 0.30 m of the LTU.
- Monitor the existing groundwater monitoring wells (MW13-1 through MW13-9) for depth to liquid petroleum hydrocarbons (if present) and depth to water.
- Purge monitoring wells and collect nine groundwater samples and two field duplicate samples.
- Georeference soil sample and monitoring well locations with easting and northing UTM coordinates based on NAD 83 system.
- Submit the samples to Maxxam Analytics International Corporation (Maxxam) of Yellowknife, NT for analysis of the parameters specified in the NWB Licence (and Section 3.2.3 of this report).
- Provide a letter from Maxxam confirming review of quality control sampling plan.

1.3.4 Deviations from Scope of Work

During the monitoring portion of the Program, three of the nine monitoring wells (MW13-1, MW13-7, and MW13-9) were sampled. The remaining monitoring wells were frozen (MW13-3, MW13-4, and MW13-5), damaged (MW13-2), or could not be located and were assumed to be destroyed (MW13-6 and MW13-8).

2.0 REGULATORY FRAMEWORK

Soil remediation requirements were determined by NWB Licence No. 1BR-FTA-1828, Part J, Table 1 (updated October 31, 2018). The soil remediation requirements were derived from the Canadian Council of Ministers of the Environment (CCME) 2008 Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil and the Government of Nunavut 2009 Environmental Guideline for Site Remediation. Per the licence, the soil analytical results were compared to the Remediation Requirements for Industrial land use and coarse-grained soil. As the Site is not located near a water wells used for domestic water supply, the guidelines for protection of potable groundwater were excluded.

Groundwater analytical results were compared to effluent guidelines provided in NWB Licence No. 1-B-FTA-1828, Part E, item 5 as well as the CCME Canadian Water Quality Guidelines (CWQG) for the protection of aquatic life (freshwater), the Environment and Climate Change Canada (ECCC) 2017 Federal Environmental Quality Guidelines for Perfluorooctanoic Sulfonate (PFOS) (ECCC guidelines), and the Health Canada 2018 Drinking Water Screening Values: Perfluoroalkylated Substances (Health Canada guidelines).

The NWB directed TC to use the Ontario Ministry of Environment and Climate Change (now referred to as the Ontario Ministry of the Environment, Conservation, and Parks) 2016 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP 2016) for parameters in groundwater where CWQG and effluent guidelines were not available.

3.0 METHODOLOGY

3.1 REMEDIAL ACTIVITIES SUPERVISION

Aeration of the LTU was conducted on August 12 and 13, 2018 by Kitnuna of Cambridge Bay, NU (Kitnuna). Aeration was completed using a dozer with a disk harrow attachment. The disk harrow attachment was dragged by the dozer across the surface of the LTU three times (in a circular pattern) to disturb surface soils to encourage an increase water absorption.

Upon completion of soil sampling (as summarized in Section 3.2.2), Kitnuna pumped accumulated water from the Apron LTU sump, using 2-inch diameter hoses, over the soil contained within the Apron LTU. Stantec monitored the depth of water in the sump during the de-watering process using an interface probe to monitor de-watering progress and water absorption by the soil. The de-watering activities were completed between August 15 and 17, 2018. The sump dimensions were georeferenced using a hand-held GPS.

3.2 ENVIRONMENTAL MONITORING

3.2.1 Groundwater Monitoring and Sampling

The groundwater monitoring portion of the Program was completed on August 8, 2018. Groundwater sampling was completed on August 9 and 10, 2018. Accessible monitoring wells in the vicinity of the Apron LTU and Apron Excavation Area which contained groundwater were monitored for depth to liquid petroleum hydrocarbons (if present) and depth to water using an interface probe, CHV and IHV using an RKI Eagle 2™, and field temperature, pH, redox potential, electrical conductivity, and dissolved oxygen using a YSI Multi Parameter Water Quality Metre.

Three monitoring wells (MW13-1, MW13-7, and MW13-9) contained sufficient groundwater for sample collection. MW13-1 is located immediately west and hydraulically cross gradient of the Apron LTU. MW13-7 is located immediately east and hydraulically cross-gradient of the former Apron excavation area. MW13-9 is located immediately south and hydraulically cross-gradient of the former Apron excavation area.

The monitoring wells were purged in general accordance with Stantec's groundwater monitoring and sampling standard operating procedures (SOPs) which are consistent with the CCME Guidance Manual (Volume 1). Because they did not recover sufficiently, the monitoring wells were purged dry three times prior to sample collection. Purge water was contained in a bucket and disposed of on the Apron LTU.

Three groundwater samples and one field duplicate sample were collected from MW13-1, MW13-7, and MW13-9 using low flow sampling techniques with a peristaltic pump and dedicated tubing. While sampling for volatile parameters using a peristaltic pump is not in accordance with Stantec's SOPs, a peristaltic pump was used as opposed to a bladder pump as the associated tubing did not contain PFAS. Groundwater samples were immediately transferred to laboratory supplied containers and stored in ice-chilled coolers prior to and during transportation to the laboratory.

One field blank sample (FIELD BLANK-02) was prepared by Stantec personnel by pouring laboratory provided PFAS free water over the sampling equipment into laboratory supplied bottles for laboratory analysis of PFAS for QA/QC purposes.

Samples were transported by First Air Cargo from Cambridge Bay to the Maxxam depot in Yellowknife, NT for transfer to Maxxam laboratories in Edmonton, Alberta and Mississauga, Ontario for analysis of the parameters specified in the NWB Licence (See section 3.2.3 of this report). One laboratory prepared trip blank (TRIP BLANK-02) was also shipped with the samples to the Maxxam depot for analysis of the licence required parameters for QA/QC purposes.

Stantec field personnel followed the TC February 2017 PFAS field sampling guidance to decrease the potential for cross-contamination.

Monitoring well locations were georeferenced using a hand-held GPS with a variance of accuracy of ± 5 m.

3.2.2 Soil Monitoring and Sampling

The soil monitoring portion of the Program was completed on August 13, 2018. Upon completion of the tilling / aeration of the Apron LTU, and prior to sump de-watering, Stantec personnel divided the Apron LTU into six sections consisting of approximately 1,250 square metres (m^2). Due to the irregular shape of the soil within the Apron LTU, it could not be divided into six equal shaped sections. One soil sample (six soil samples total) was collected from each section from depths of approximately 0.0-0.3 m below ground surface (BGS). The soil samples were identified as APR-S01 through APR-S06. One field duplicate soil sample (identified as APR-S-QC01) was collected from APR-S03. The soil samples were collected as discrete samples using hand tools. One half of each soil sample was immediately transferred into laboratory supplied containers and stored in ice-chilled coolers prior to and during transportation to the laboratory. The second half of each sample was transferred to a plastic bag and allowed to warm up in the running field vehicle, at an ambient temperature of approximately 21 ºC, for approximately 15 minutes prior to field screening for CHV and IHV using an RKI Eagle 2™.

Samples were transported by First Air Cargo from Cambridge Bay to the Maxxam depot in Yellowknife, NT for transfer to the Maxxam laboratory in Edmonton, Alberta and Mississauga, Ontario for analysis of the parameters specified in the NWB Licence (See section 3.2.3 of this report).

Soil sample locations were georeferenced using a hand-held GPS with a variance of accuracy of ± 5 m.

3.2.3 Laboratory Analytical Program

The laboratory analytical Program is summarized in Table 3-1, below.

Table 3-1 Laboratory Analytical Program

Source	Laboratory Analysis
Groundwater (Part J, Item 7 of NWB Licence)	Total suspended solids (TSS), total hardness, conductivity, ammonia nitrogen, oil and grease, calcium, sodium, chloride, total aluminum, total cadmium, total copper, total lead, total nickel, total silver, total zinc, pH, total alkalinity, nitrate-nitrite, total phenols, magnesium, potassium, sulphate, total arsenic, total cobalt, total iron, total molybdenum, total selenium, total titanium, total extractable hydrocarbons (TEH), polycyclic aromatic hydrocarbons (PAH), per- and polyfluoroalkyl substances (PFAS), and BTEX.
Soil[1] (Part J, Table 1 of NWB Licence)	Benzene, toluene, ethylbenzene, and toluene (BTEX), PHC Fractions 1 through 4 (F1-F4), and lead.
Notes: [1]The NWB licence provides a remedial guideline for polychlorinated biphenyls (PCBs) in soil; however, TC confirmed that soil sampling for PCBs was not required during the 2018 program	

3.2.4 Quality Assurance and Quality Control

The following field quality assurance and quality control (QA/QC) procedures were followed during the Program.

- Soil and groundwater sample collection and equipment decontamination were completed in general accordance with relevant Stantec's SOPs
- Equipment was calibrated by Stantec personnel prior to fieldwork
- Groundwater samples collected for PFAS analysis were collected per the TC Per-and Polyfluoroalkyl Substances (PFAS) field sampling guidance (February 2017)
- Soil and groundwater samples were stored in ice-chilled coolers prior to, and during transportation to the laboratory
- Soil and groundwater samples were delivered to the laboratory following standard chain-of-custody protocols
- Samples selected for analysis were analyzed by Maxxam, which is accredited by the Canadian Association of Laboratory Accreditation (CALA)
- One field duplicate groundwater sample and one field duplicate soil sample were collected by Stantec and analyzed by Maxxam as part of the QA/QC program. The analytical results were compared to those of the parent samples using the method of relative percent difference (RPD) to evaluate precision
- One trip blank and one field blank water samples were collected by Stantec and analyzed by Maxxam

In addition to the Stantec QA/QC procedures, the laboratory analyzes and assesses method blanks, Certified Reference Materials, method spikes, and surrogate recoveries to monitor data quality. These results are presented as part of laboratory certificates of analysis.

Maxxam reviewed Stantec's sampling plan prior to field work and provided confirmation that the sampling plan satisfied the CCME requirements for field QC. A copy of Maxxam's letter is provided in **Appendix B**.

4.0 RESULTS

The site layout and monitoring well locations are shown on Figures 2 and 3, **Appendix A**. Soil sampling locations are shown on Figure 4, **Appendix A**. Water levels during sump de-watering are summarized on Table 1, **Appendix C**. Groundwater monitoring results and groundwater analytical results are summarized in Tables 2 and 3, **Appendix C**. Soil monitoring and analytical results are summarized on Tables 4 and 5, **Appendix C** and Figure 3**, Appendix A**. QA/QC result are summarized on Table 6, **Appendix C.** The GPS locations (UTM Easting and Northing coordinates) of groundwater monitoring wells and soil samples are summarized on Table 7**, Appendix C** and Figure 2, **Appendix A**. Copies of the laboratory certificates of analysis are presented in **Appendix D**, and a photographic log is presented in **Appendix E**.

4.1 REMEDIAL ACITVITIES SUPERVISION

The Apron LTU contained one sump located in the southwest corner (APR-SW). Based on field measurements, Stantec estimated that the APR-SW sump contained approximately 70 m^3 of water. The sump was fully de-watered onto the Apron LTU between August 15 and 17, 2018. Upon leaving the Site, Stantec personnel noted that the sump had begun to re-charge. As the disk harrow attachment only disturbed approximately the top 0.3 m of soil in the LTU, it was concluded that soil absorption was limited.

4.2 ENVIRONMENTAL MONITORING

4.2.1 Groundwater Monitoring and Sampling

Stantec monitored nine groundwater monitoring wells associated with the Apron LTU and Apron Excavation Area. During the monitoring portion of the Program, three of the nine monitoring wells contained sufficient groundwater to allow for sampling. The remaining monitoring wells were frozen (MW13-3, MW13-4, and MW13-5), damaged (MW13-2), or could not be located and were assumed to be destroyed (MW13-6 and MW13-8).

The depth to water in MW13-1, MW13-7, and MW13-9 ranged from 0.515 metres below top of casing (mBTOC) in MW13-7 to 1.914 mBTOC in MW13-1. The depth to ice in the frozen wells (MW13-3, MW13-4, and MW13-5) ranged from 2.215 mBTOC in MW13-5 to 2.415 in MW13-3. Parameters including temperature, specific conductance, pH, oxidation reduction potential, and dissolved oxygen were also measured in the wells containing groundwater.

Three groundwater samples were collected from MW13-1, MW13-7, and MW13-9, and one field duplicate groundwater sample was collected from MW13-9. The samples were submitted for laboratory analysis of the parameters required by the NWB Licence. The reported concentrations of dissolved BTEX, PHC Fraction F1-F2, and PAHs parameters were below the laboratory reportable detection limits. The dissolved PFAS concentrations ranged from below the laboratory RDLs to detectable concentrations generally approximately an order of magnitude below applicable guidelines. However, the Perfluourohexanoic Acid (PFHxA) concentrations were marginally below the applicable guideline of 200 ng/L and ranged from 120 ng/L to 200 ng/L. Groundwater analytical results indicated that the concentrations of the parameters analyzed per the NWB Licence satisfied the referenced guidelines with the exception of the parameters shown in Table 4-1 below:

Table 4-1 Summary of Parameter Concentrations Exceeding Applicable Guidelines

Monitoring Well	Parameter Category	Individual Parameter	Applicable Guideline Exceeded
MW13-1	Total Metals	Aluminum, iron	CWQG Aluminum: 1.2 times applicable, within same order of magnitude. Iron: One order of magnitude greater than the applicable guideline.
	Routine	Dissolved chloride	CWQG 2.75 times the applicable guideline, within same order of magnitude
MW13-7	Total Metals	Copper, iron, uranium	CWQG Copper: 1.7 times the applicable guideline, within same order of magnitude. Iron: 1.9 times the applicable guideline, within same order of magnitude. Uranium: 2 times the applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride	CWQG 6.75 times the applicable guideline, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 2.3 times applicable guideline, within same order of magnitude.
MW13-9	Total Metals	Boron, iron, uranium	CWQG Boron: 1.3 times applicable guideline, within same order of magnitude. Iron: 36 times applicable guideline, 2 orders of magnitude greater. Uranium: 3.9 times applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride, dissolved sodium	CWQG, MECP Chloride: 3 orders of magnitude greater than CWQG, 1 order of magnitude greater than MECP. Sodium: 1.61 times MECP, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 3.2 times applicable guideline, within same order of magnitude.

4.2.2 Soil Monitoring and Sampling

Soil samples were collected from a depth of approximately 0.0-0.3 m BGS within the Apron LTU and consisted of clayey gravelly sand with some silt. Field screening results for CHV and IHV were less than the detection limits of the equipment.

Six soil samples and one field duplicate soil sample were submitted for analysis of the parameters required by the NWB Licence (with the exception of PCBs). The laboratory analytical results indicated that the concentrations of the parameters analyzed satisfied the referenced guidelines.

The reported BTEX and PHC F1-F4 soil concentrations were below the laboratory detection limit in the submitted soil samples, with the exception of F2 (APR-S01, S03, S04, and S06), F3 (in the 6 soil samples), and F4 (APR-S03 to S05). The F2 soil concentrations ranged approximately from 5.5 to 16 times lower than the applicable guideline of 260 mg/kg. Soil sample APR-S01 was the only sample that had elevated (i.e., an order of magnitude greater than the detection limit) F2 concentration at 180 mg/kg. The F3 soil concentrations were approximately 1 to 20.5 times lower than the applicable guideline of 1700 mg/kg. The F4 soil concentrations ranged approximately from 4 to 10 times lower than the applicable guideline of 3300 mg/kg.

Detectable lead soil concentrations were measured in the six samples, ranging from 5.7 to 8.5 mg/kg (two orders of magnitude below the applicable guideline of 600 mg/kg).

5.0 QUALITY ASSURANCE / QUALITY CONTROL

A QA/QC program was conducted to assess data reliability. Soil and groundwater samples were collected in general accordance with Stantec's sampling SOPs, were uniquely labelled, and control was maintained using chain-of-custody forms. Soil samples were collected in laboratory supplied containers and preserved in ice-chilled insulated coolers.

The data quality objective (DQO) of the Program was to collect data that were reproducible, complete, and suitable for comparison with the referenced guidelines.

5.1 SAMPLE CONTAINERS

In 2016, the CCME updated the sample container requirements for soil analyzed for BTEX and PHC F1 from a 125 mL glass jar, to a sample preserved in methanol. Due to transportation of dangerous goods requirements on commercial flights, methanol could not be shipped from Cambridge Bay; therefore, the samples submitted for BTEX and PHC F1 analysis were submitted in 125 mL glass jars supplied by the laboratory. While this procedure does not satisfy the CCME sampling requirements, it is consistent with the historical sampling programs at the Site; therefore, the 2018 soil analytical results for BTEX and PHC F1 were suitable for comparison to historical analytical results and deemed suitable for the Program.

5.2 SAMPLE HOLD TIMES

The dates of sample receipt at the laboratory were reported on the laboratory certificates of analysis. A review of sample hold times indicated that the samples were submitted within the recommended hold times.

5.3 TEMPERATURE

Sample temperatures were recorded upon arrival at the laboratory by measuring up to three random sample container temperatures and calculating the average result to obtain a representative temperature. The ideal temperature should be approximately 4°C. Samples that arrive at the laboratory with temperatures measured above 4°C may have reported concentrations for constituents that are biased low as a result of the elevated sample temperatures.

Although it is ideal to have sample temperatures below 4°C, Maxxam has noted the difficulty in maintaining samples below 4°C. As such, Maxxam considers a temperature range of 4°C to 10°C as acceptable. Samples submitted to the laboratory indicated temperatures that were considered acceptable.

5.4 FIELD DUPLICATES

The method of RPD is used to evaluate the sample result variability and is calculated by the following equation:

$$RPD = \left[\frac{|S1 - S2|}{S3} \right] \times 100$$

Where:
RPD = relative percent difference
S1 = original soil or groundwater sample concentration
S2 = duplicate soil or groundwater sample concentration
S3 = average concentration = (S1 + S2)/2

In the event that the analytical result for either sample is less than five times the laboratory reportable detection limit (RDL), any calculated RPD is considered not to be valid and no conclusion can be made with respect to the data reproducibility. The generally accepted industry standard for acceptable RPD's analyses is less than or equal to 60% for field duplicated soil samples and less than or equal to 40% for field duplicated groundwater samples (CCME, 2016).

APR-S-QC-01 was field duplicate soil sample of APR-S03-0-0.3. Where they could be calculated, the RPDs ranged from 0% (lead) to 17% (F3) and satisfied the CCME requirements.

GW-QC-02 was a field duplicate groundwater sample of MW13-09. Where they could be calculated, the RPD's ranged from 0% (numerous parameters) to 25.6% (total ammonia) and satisfied the CCME requirements.

The RPD results are summarized on Table 3, **Appendix C** for soil and Table 5, **Appendix C** for groundwater.

5.5 TRIP BLANK

TRIP BLANK-02 was a de-ionized and PFAS-free water trip blank sample provided by Maxxam. The trip blank sample was submitted for analysis of the NWB Licence required parameters. Laboratory analytical results indicated the reported concentrations of the tested parameters were less than the laboratory RDL, where applicable. As such, the trip blank results indicate that sample shipping and storage did not influence the groundwater analytical results.

5.6 FIELD BLANK

FIELD-BLANK-02 was a de-ionized and PFAS-free water field blank. The water was provided by Maxxam and was packaged in laboratory supplied bottles in the field by Stantec using the same equipment used to collect the groundwater samples. The field blank sample was submitted for analysis of PFAS parameters. Laboratory analytical results indicated the reported concentrations the tested parameters were less than the laboratory RDLs. As such, the field blank results indicate that sample handling and sampling equipment did not influence the groundwater analytical results.

5.7 EQUIPMENT BLANK

EQUIPMENT-BLANK-02 was a de-ionized and PFAS-free water field blank. The water was provided by Maxxam and was poured over the equipment used for soil sampling and into laboratory supplied bottles by Stantec personnel in the field. The equipment blank sample was submitted for analysis of PFAS parameters. Laboratory analytical results indicated the parameter concentrations were less than the laboratory RDLs. As such, the equipment blank results indicate that sampling equipment did not influence the groundwater analytical results.

5.8 LABORATORY QA/QC

In addition to the Stantec QA/QC procedures, the laboratory analyzes and assesses method blanks, Certified Reference Materials, method spikes, and surrogate recoveries to monitor data quality. These results were considered acceptable and are presented as part of laboratory certificates of analysis in **Appendix D.**

5.9 SUMMARY

Based on the summary of results above, the DQO for the Program was considered to have been met.

6.0 SUMMARY OF FINDINGS

Stantec completed the Program at the Apron LTU and Apron Excavation Area located at the Cambridge Bay Airport in Cambridge Bay, Victoria Island, Nunavut in August 2018. The findings of the Program are summarized below.

Remedial Activities Supervision

Aeration of the LTU was conducted on August 12 and 13, 2018 by Kitnuna. Aeration was completed using a dozer with a disk harrow attachment to till the soil. The disk harrow was dragged by the dozer across the surface of the LTU three times (in a circular pattern) to potentially increase water absorption.

Upon completion of soil sampling, Kitnuna pumped accumulated water from sump, using two-inch diameter hoses, over the soil contained within the Apron LTU. De-watering activities were conducted between August 15 and 17, 2018.

Based on field measurements, Stantec estimated that the Apron sump contained approximately 70 m^3 of water. The sump was fully de-watered onto the Apron LTU. Upon leaving the Site, Stantec personnel observed that the sumps had begun to re-charge. As the disk harrow attachment only disturbed approximately the top 0.3 m of soil, it was concluded that water absorption into the LTU soils was limited.

Environmental Monitoring

During the monitoring portion of the Program, six of the nine existing monitoring wells either did not contain sufficient water to allow for sampling, were frozen, or could not be located and were assumed to be destroyed.

Three groundwater samples and one field duplicate groundwater sample were collected from MW13-1, MW13-7, and MW13-9. MW13-1 is located immediately west and hydraulically cross gradient of the Apron LTU. MW13-7 is located immediately east and hydraulically cross-gradient of the former Apron excavation area. MW13-9 is located immediately south and hydraulically cross-gradient of the former Apron excavation area. The reported concentrations of dissolved BTEX, PHC Fraction F1-F2, and PAHs parameters were below the laboratory reportable detection limits. The dissolved PFAS concentrations ranged from below the laboratory RDLs to detectable concentrations (generally approximately an order of magnitude below applicable guidelines). However, the Perfluourohexanoic Acid (PFHxA) concentrations were just below the applicable guideline of 200 ng/L and ranged from 120 ng/L to 200 ng/L. Groundwater analytical results indicated that the concentrations of the parameters analyzed per the NWB Licence satisfied the referenced guidelines with the exception of the parameters shown in Table 6-1 below:

Table 6-1 Summary of Parameter Concentrations Exceeding Applicable Guidelines

Monitoring Well	Parameter Category	Individual Parameter	Applicable Guideline Exceeded
MW13-1	Total Metals	Aluminum, iron	CWQG Aluminum: 1.2 times applicable, within same order of magnitude. Iron: One order of magnitude greater than the applicable guideline.
	Routine	Dissolved chloride	CWQG 2.75 times the applicable guideline, within same order of magnitude
MW13-7	Total Metals	Copper, iron, uranium	CWQG Copper: 1.7 times the applicable guideline, within same order of magnitude. Iron: 1.9 times the applicable guideline, within same order of magnitude. Uranium: 2 times the applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride	CWQG 6.75 times the applicable guideline, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 2.3 times applicable guideline, within same order of magnitude.
MW13-9	Total Metals	Boron, iron, uranium	CWQG Boron: 1.3 times applicable guideline, within same order of magnitude. Iron: 36 times applicable guideline, 2 orders of magnitude greater. Uranium: 3.9 times applicable guideline, within same order of magnitude.
	Routine	Dissolved chloride, dissolved sodium	CWQG, MECP Chloride: 3 orders of magnitude greater than CWQG, 1 order of magnitude greater than MECP. Sodium: 1.61 times MECP, within same order of magnitude.
	PFAS	Perfluoropentanoic Acid (PFPeA)	HC 3.2 times applicable guideline, within same order of magnitude.

Upon completion of the tilling / aeration of the Apron LTU, and prior to sump de-watering, Stantec personnel divided the Apron LTU into six sections consisting of approximately 1,250 square metres (m^2). Due to the irregular shape of the soil within the Apron LTU, it could not be divided into six equal shaped sections. One discrete soil sample (six soil samples total) was collected from each section from depths of approximately 0.0-0.3 m BGS. One field duplicate soil sample was collected for QA/QC purpose. The soil samples were submitted for analysis of the parameters required by the NWB Licence, with the exception of PCBs.

The soil samples consisted clayey gravelly sand with some silt. Field screening results for CHV and IHV were less than the detection limits of the equipment. The laboratory analytical results indicated that the concentrations of the parameters analyzed satisfied the referenced guidelines.

The reported BTEX and PHC F1-F4 soil concentrations were below the laboratory detection limit in the of the submitted soil samples, except for F2 (APR-S01, S03, S04, and S06), F3 (in the 6 soil samples), and F4 (APR-S03 to S05). The F2 soil concentrations ranged approximately from 5.5 -16 times lower than the applicable guideline of 260 mg/kg. APR-S01 was the only sample that indicated elevated F2 concentrations at 180 mg/kg. The F3 soil concentrations were approximately 1 to 20.5 times lower than the applicable guideline of 1700 mg/kg. The F4 soil concentrations ranged approximately from 4 to 10 times lower than the applicable guideline of 3300 mg/kg.

Detectable lead soil concentrations were measured in the six samples, ranging from 5.7 to 8.5 mg/kg (below the applicable guideline of 600 mg/kg).

Quality Assurance / Quality Control

The data quality objective (DQO) of the Program was to collect data that were reproducible, complete, and suitable for comparison with the referenced guidelines. Based on the results of the QA/QC analysis, the DQO for the Program was considered to have been met.

7.0 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- The condition and volume of water in the groundwater monitoring wells limited the number of wells that could be sampled.
- Transportation of dangerous goods requirements for shipping methanol on commercial flights; therefore, the CCME requirement for sample preservation for volatile compounds (BTEX) could not be adhered to.
  - Soil samples for BTEX were collected in 125 mL glass jars which is consistent with historical monitoring programs.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

Limitations
January 2019

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

8.0 REFERENCES

Arcadis Canada Inc. December 1, 2018. Draft. 2017 Environmental Monitoring Program at Cambridge Bay Airport Apron LTU, Cambridge Bay Airport, NU. File No. 102089-003.

CCME. 2008. Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil.

CCME. 2014. Water Quality Guidelines for the Protection of Aquatic Life. Freshwater.

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Nunavut Water Board. May 17, 2018. NWB Water Licence No. 1BR-FTA1828 (Updated October 31, 2018).

Public Services and Procurement Canada. July 12, 2018. Terms of Reference for Apron and Fire Training Area Site Remedial Activities Supervision and Environmental Monitoring Program, Cambridge Bay Airport, Victoria Island, Nunavut.

Transport Canada. 2017. Per-and Polyfluoroalkyl Substances (PFAS) Field Sampling Guidance.

APPENDIX A

Figures

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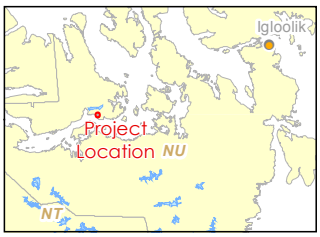

Site Feature
Land Parcel

0 400 800 metres
1:30,000 (at original document size of 8.5x11)

Stantec

Project Location
Cambridge Bay
Nunavut

110220176
Prepared by MK on 2018-09-13
Quality Review by MR on 2018-11-16
Approved by TS on 2018-11-20

Project
2018 Site Remedial Activities Supervision and Enviornmental Monitoring Program - Cambridge Bay Airport, Apron Land Treatment Unit and Excavation Area

Figure No.
1

Title
Site Location Plan

Notes
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with permission from Microsoft Corporation.

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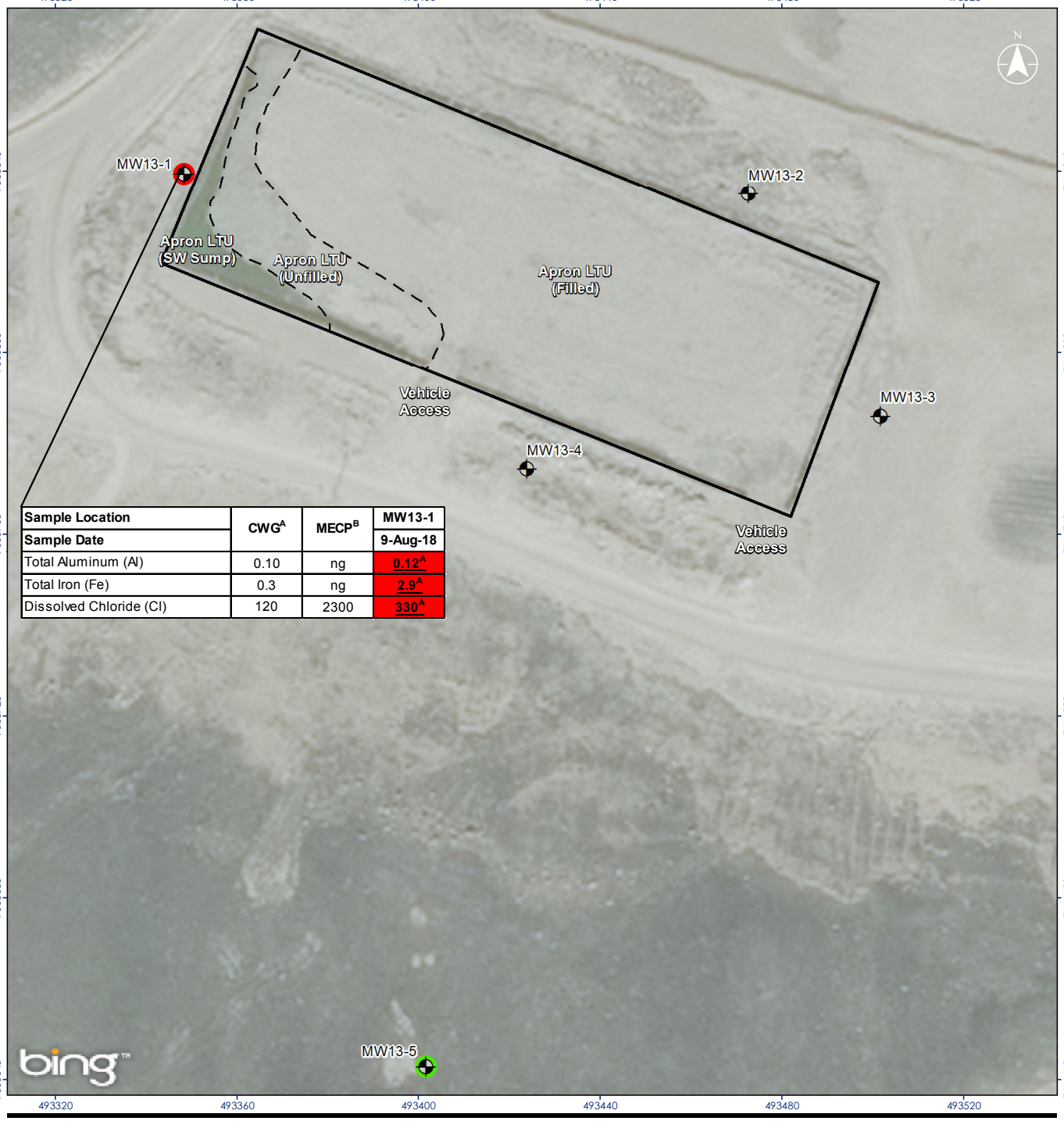
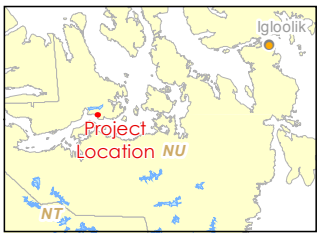


Sample Location	CWG[A]	MECP[B]	MW13-1
Sample Date			9-Aug-18
Total Aluminum (Al)	0.10	ng	0.12[A]
Total Iron (Fe)	0.3	ng	2.9[A]
Dissolved Chloride (Cl)	120	2300	330[A]



- Monitoring Well Location (Others 2013)
- Groundwater Sample Below Applicable Guidelines
- Groundwater Sample Above Applicable Guidelines
- Approximate LTU Limits

0 20 40 metres

1:1,300 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Base features: Geogratis, ©Department of Natural Resources Canada. All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with permission from Microsoft Corporation.

[A] CCME. Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater.

[B] Ontario Ministry of the Environment and Climate Change (nor referred to as the Ministry of Environment, Conservation, and Parks). Soil, Groundwater, and Sediment Standards for use under Part XV.1 of the Environmental Protection Act. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition.

Stantec

Project Location
Cambridge Bay
Nunavut

110220176
Prepared by MK on 2019-01-17
Quality Review by DJ on 2019-01-21
Approved by LVN on 2019-01-24

Client/Project
Public Services and Procurement Canada (PSCPC)
For Transport Canada, Cambridge Bay Airport
Apron Land Treatment Unit

Figure No.
2

Title
Site Plan Showing LTU Monitoring Well Locations, and Groundwater Analytical Results

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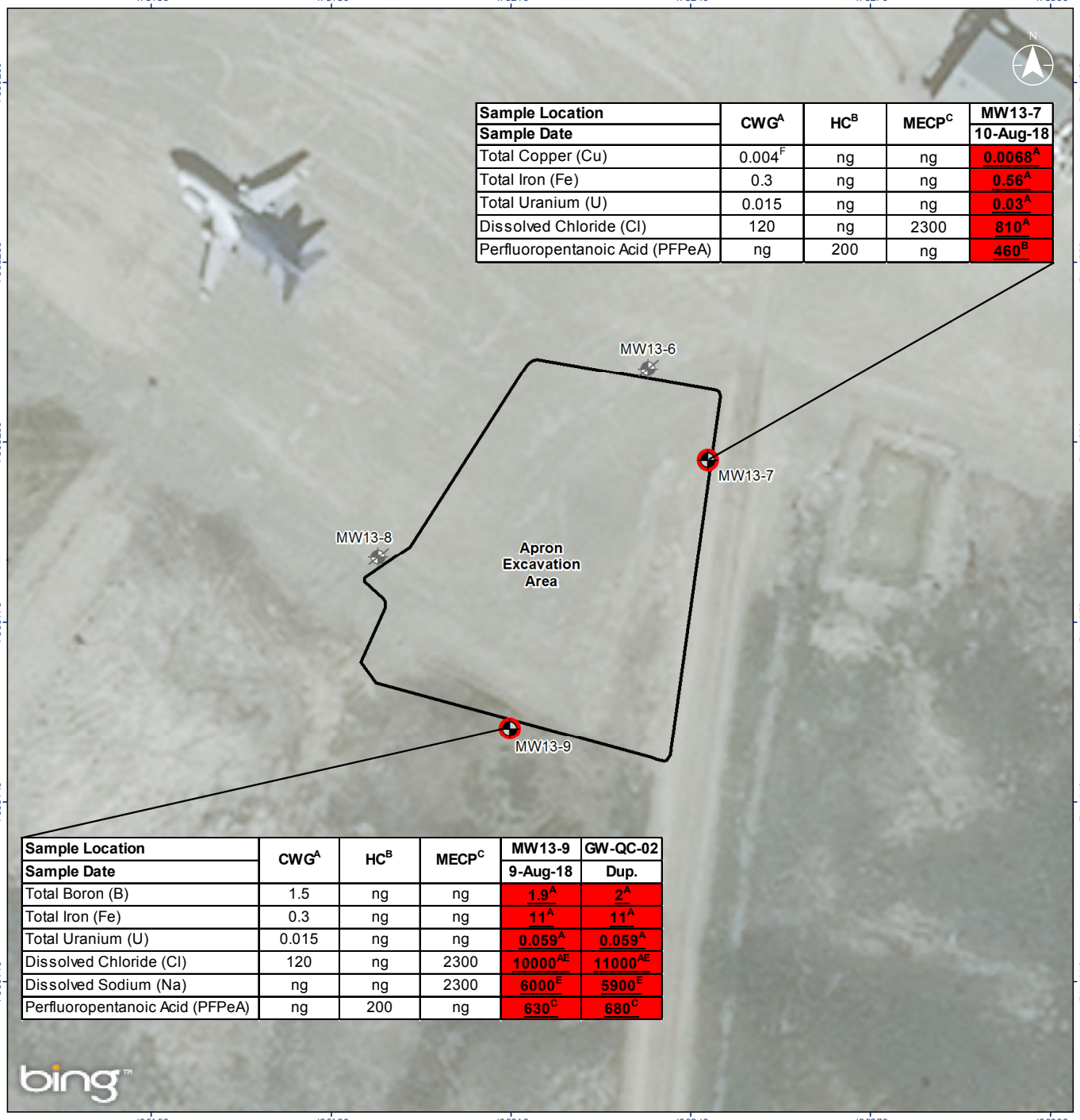
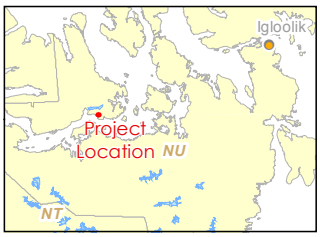


Sample Location	CWG[A]	HC[B]	MECP[C]	MW13-7
Sample Date				10-Aug-18
Total Copper (Cu)	0.004[F]	ng	ng	**0.0068[A]**
Total Iron (Fe)	0.3	ng	ng	**0.56[A]**
Total Uranium (U)	0.015	ng	ng	**0.03[A]**
Dissolved Chloride (Cl)	120	ng	2300	**810[A]**
Perfluoropentanoic Acid (PFPeA)	ng	200	ng	**460[B]**

Sample Location	CWG[A]	HC[B]	MECP[C]	MW13-9	GW-QC-02
Sample Date				9-Aug-18	Dup.
Total Boron (B)	1.5	ng	ng	**1.9[A]**	**2[A]**
Total Iron (Fe)	0.3	ng	ng	**11[A]**	**11[A]**
Total Uranium (U)	0.015	ng	ng	**0.059[A]**	**0.059[A]**
Dissolved Chloride (Cl)	120	ng	2300	**10000[AE]**	**11000[AE]**
Dissolved Sodium (Na)	ng	ng	2300	**6000[E]**	**5900[E]**
Perfluoropentanoic Acid (PFPeA)	ng	200	ng	**630[C]**	**680[C]**



Monitoring Well Location (Others 2013)

Destroyed Monitoring Well (Approximate Location)

Groundwater Sample Above Applicable Guidelines

Approximate Apron Excavation

0 15 30 metres

1:1,000 (at original document size of 8.5x11)

[A] CCME. Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater.

[B] Health Canada. July 2018. Drinking Water Screening Values: Perfluoroalkylated Substances.

[C] Ontario Ministry of the Environment and Climate Change (nor referred to as the Ministry of Environment, Conservation, and Parks). Soil, Groundwater, and Sediment Standards for use under Part XV.1 of the Environmental Protection Act. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition.

Notes

1. Coordinate System: NAD 1983 UTM Zone 13N
2. Base features: Geogratis, ©Department of Natural Resources Canada. All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with permission from Microsoft Corporation.

Stantec

Project Location
Cambridge Bay
Nunavut

110220176
Prepared by MK on 2019-01-17
Quality Review by DJ on 2019-01-21
Approved by LVN on 2019-01-24

Client/Project
Public Services and Procurement Canada (PSCPC)
For Transport Canada, Cambridge Bay Airport
Apron Land Treatment Unit

Figure No.
3

Title
Site Plan Showing Excavation Monitoring Well Locations, and Groundwater Analytical Results

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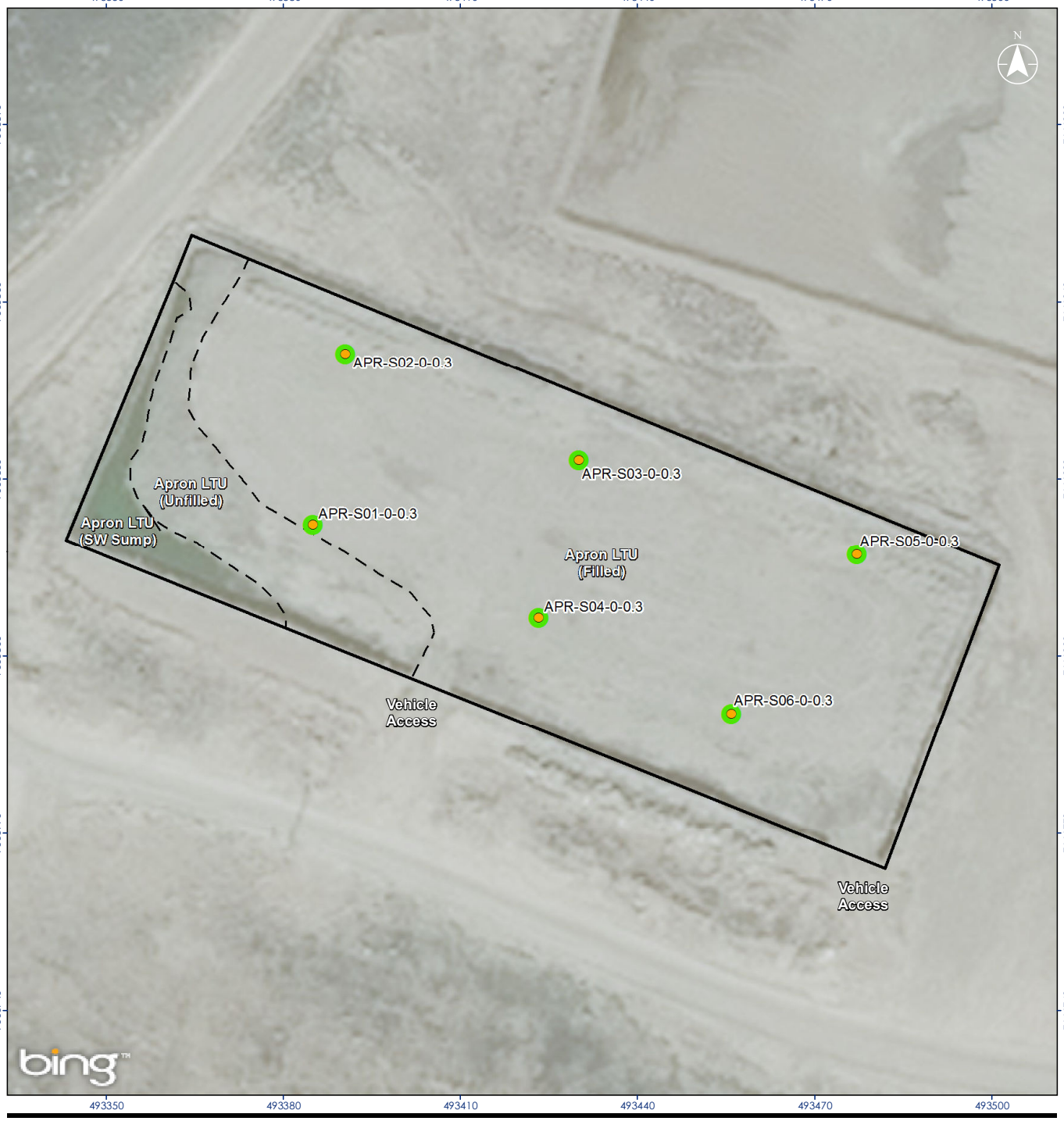

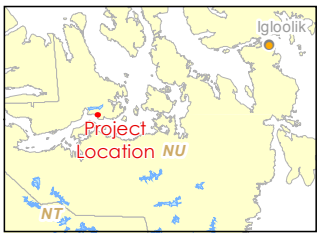

Soil Sampling Location (Apron LTU)

Soil Sample Below Applicable Guidelines

Approximate LTU Limits

0 15 30 metres

1:1,000 (at original document size of 8.5x11)

Stantec

Project Location
Cambridge Bay
Nunavut

110220176
Prepared by MK on 2019-01-17
Quality Review by DJ on 2019-01-21
Approved by LVN on 2019-01-24

Client/Project
Public Services and Procurement Canada (PSCPC)
For Transport Canada, Cambridge Bay Airport
Apron Land Treatment Unit

Figure No.
4

Title
Site Plan Showing Soil Sampling Locations and Soil Analytical Results

Notes
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Base features: Geogratis, ©Department of Natural Resources Canada. All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with permission from Microsoft Corporation.
4. Soil Guideline Reference: Nunavut Water Board. 2018. Licence No. 1BR-FTA-1828. Part J. Table 1 - Remediation Requirements. Industrial Land Use. Excluding the protection of potable groundwater.

APPENDIX B

Maxxam Letter RE: QC

maxxam.ca
MAXXAM ANALYTICS
4606 Canada Way
Burnaby, BC V5G 1K5
Office 604 734 7276
Toll Free 800 665 8566
Fax 604 731 2386

Stantec
10160 112 Street
Edmonton AB T5K 2L6 CA

Attn: Lindsay van Noortwyk , Associate / Project Manager

Re: Cambridge Bay Apron Sampling Plan (as provided by Stantec)

Dear Ms van Noortwyk

As requested, Maxxam has reviewed the Cambridge Bay Apron Sampling Plan (appended). In our opinion the Plan meets the CCME requirements for field QC.

I trust this meets your needs. If anything further is required, please do not hesitate to contact me directly. bloescher@maxxam.ca 250 325-8887.

Sincerely,

Barry Loescher, PhD PChem QP
Quality Systems Specialist

Source	Location	Laboratory Analysis
Soil	6 representative soil samples and 1 field duplicate sample from the Apron LTU.	Benzene, toluene, ethylbenzene, and toluene (BTEX), PHC fractions 1 through 4 (F1-F4), and lead
Groundwater	9 groundwater samples, 1 field duplicate sample, 1 field blank, and 1 trip blank (from 13-1 through MW13-9)	Total suspended solids (TSS), total hardness, conductivity, ammonia nitrogen, oil and grease, calcium, sodium, chloride, total aluminum, total cadmium, total copper, total lead, total nickel, total silver, total zinc, pH, total alkalinity, nitrate-nitrite, total phenols, magnesium, potassium, sulphate, total arsenic, total cobalt, total iron, total molybdenum, total selenium, total titanium, total extractable hydrocarbons (TEH), polycyclic aromatic hydrocarbons (PAH), per- and polyfluoroalkyl substances (PFAS), and BTEX.
Soil	12 soil samples and 2 field duplicates and 1 equipment blank (water)	BTEX, PHC F1-F4, lead, PFAS.

APPENDIX C

Tables

Stantec

2018 Site Remedial Activities Supervision and Environmental Monitoring Program
Cambridge Bay Airport, Apron Area Land Treatment Unit and Excavation Area
Public Services and Procurement Canada for Transport Canada
110220176
Jan-19

Table 1 - Apron Water Level Monitoring

Sump Location	Date	Time	mBTOB	Comments
APR-SW	15-Aug-18	1515	0.87	Pump Start
APR-SW	15-Aug-18	1647	0.90	
APR-SW	15-Aug-18	1726	0.905	
APR-SW	15-Aug-18	1815	0.91	Pump Off
APR-SW	16-Aug-18	754	0.91	Pump On
APR-SW	16-Aug-18	810	0.92	
APR-SW	16-Aug-18	819	0.93	
APR-SW	16-Aug-18	930	0.935	
APR-SW	16-Aug-18	1030	0.94	
APR-SW	16-Aug-18	1200	0.95	
APR-SW	16-Aug-18	1230	0.96	
APR-SW	16-Aug-18	1330	0.965	
APR-SW	16-Aug-18	1500	0.99	
APR-SW	16-Aug-18	1600	0.102	
APR-SW	16-Aug-18	1630	0.1025	
APR-SW	16-Aug-18	1730	0.104	
APR-SW	16-Aug-18	1800	0.1045	Pump Off
APR-SW	17-Aug-18	730	0.104	Pump On - Note Rain 16-Aug-18
APR-SW	17-Aug-18	915	0.105	
APR-SW	17-Aug-18	930	0.106	
APR-SW	17-Aug-18	945	0.108	
APR-SW	17-Aug-18	1000	0.11	
APR-SW	17-Aug-18	1015	0.1125	
APR-SW	17-Aug-18	1052	0.117	
APR-SW	17-Aug-18	1130	0.13	De-watering Complete

Estimated total volume of water removed - 70 m^3

Notes:

mBTOB Metres below top of berm

Stantec

2018 Site Remedial Activities Supervision and Environmental Monitoring Program
Cambridge Bay Airport, Apron Area Land Treatment Unit and Excavation Area
Public Services and Procurement Canada for Transport Canada
110220176
Jan-19

Table 2 - 2018 Groundwater Monitoring Results

Well ID	Monitoring Date	Water Level (mBTOC)	Frozen Level (mBTOC)	Depth to Bottom (mBTOC)	Stick-up Height (mAGS)	CHV (ppm)	IHV (ppm)	Sampling Date	Temperature (°C)	Specific Conductance (mS/cm)	pH	ORP (mV)	DO (mg/L)	Comments
MW13-1	08-Aug-18	1.914	-	2.309	1.18	0	0	09-Aug-18	4.17	3.204	7.43	64.7	4.92	
MW13-2	08-Aug-18	-	-	-	1.22	0	0	-	-	-	-	-	-	Blocked near surface - Could not repair
MW13-3	08-Aug-18	-	2.415		0.77	0	0	-	-	-	-	-	-	Frozen - could not sample
MW13-4	08-Aug-18	-	2.321		1.21	0	0	-	-	-	-	-	-	Frozen - could not sample
MW13-5	08-Aug-18	-	2.215		1.06	0	0	-	-	-	-	-	-	Frozen - could not sample
MW13-6	08-Aug-18	-	-	-	-	-	-	-	-	-	-	-	-	Could not locate (destroyed)
MW13-7	08-Aug-18	0.515	-	1.606	-0.07	0	0	10-Aug-18	3.26	4.402	7.25	81.8	2.24	
MW13-8	08-Aug-18	-	-	-	-	-	-	-	-	-	-	-	-	Could not locate (destroyed)
MW13-9	08-Aug-18	0.621	-	2.209	0.65	0	0	09-Aug-18	3.27	31.09	7.03	27.7	0.48	

Notes:

CHV	Combustible headspace vapour concentrations	ORP	Oxidization/Reduction Potential
IHV	Ionizable headspace vapour concentrations	mV	millivolts
m BTOC	Metres below top of Casing	DO	Dissolved oxygen
m AGS	Meters above ground surface	mg/L	Milligrams per litre
ppm	parts per million	°C	Degrees Celsius
mS/cm	millisiemens per centimeter	-	Not monitored

Stantec

2018 Site Remedial Activities Supervision and Environmental Monitoring Program
Cambridge Bay Airport, Apron Area Land Treatment Unit and Excavation Area
Public Services and Procurement Canada for Transport Canada
110220176
Jan-19

Table 3 - 2018 Groundwater Analytical Results

Sample Location	Units	CWG[A]	NWB[B]	HC[C]	ECC[D]	MECP[E]	MW13-1	MW13-7	MW13-9	GW-QC-02	RPD (%)
Sample Date							09-Aug-18	10-Aug-18	09-Aug-18	Duplicate of MW13-9	
Sampling Company							Stantec	Stantec	Stantec		
Laboratory							Maxxam	Maxxam	Maxxam		
Petroleum Hydrocarbons											
Benzene	mg/L	0.37	0.37	ng	ng	0.044	<0.00040	0.0031	<0.00040	<0.00040	nc
Toluene	mg/L	0.002	0.002	ng	ng	18	<0.00040	<0.00040	<0.00040	<0.00040	nc
Ethylbenzene	mg/L	0.090	0.090	ng	ng	2.3	<0.00040	<0.00040	<0.00040	<0.00040	nc
m & p-Xylene	mg/L	ng	ng	ng	ng	ng	<0.00080	<0.00080	<0.00080	<0.00080	nc
o-Xylene	mg/L	ng	ng	ng	ng	ng	<0.00040	<0.00040	<0.00040	<0.00040	nc
Xylenes (Total)	mg/L	ng	ng	ng	ng	4.2	<0.00089	<0.00089	<0.00089	<0.00089	nc
F1 (C6-C10) - BTEX	mg/L	ng	ng	ng	ng	0.75	<0.10	<0.10	<0.10	<0.10	nc
F1 (C6-C10)	mg/L	ng	ng	ng	ng	ng	<0.10	<0.10	<0.10	<0.10	nc
F2 (C10-C16 Hydrocarbons)	mg/L	ng	ng	ng	ng	0.15	<0.10	<0.10	<0.10	<0.10	nc
Polycyclic Aromatic Hydrocarbons											
Benzo[a]pyrene equivalency	mg/L	ng	ng	ng	ng	ng	<0.000010	<0.000010	<0.000010	<0.000010	nc
Acenaphthene	mg/L	0.0058	ng	ng	ng	0.6	<0.00010	<0.00010	<0.00010	<0.00010	nc
Acenaphthylene	mg/L	ng	ng	ng	ng	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	nc
Acridine	mg/L	0.0044	ng	ng	ng	ng	<0.000050	<0.000050	<0.000050	<0.000050	nc
Anthracene	mg/L	0.000012	ng	ng	ng	0.0024	<0.000010	<0.000010	<0.000010	<0.000010	nc
Benzo(a)anthracene	mg/L	0.000018	ng	ng	ng	0.0047	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
Benzo(b&j)fluoranthene	mg/L	ng	ng	ng	ng	0.00075	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
Benzo(k)fluoranthene	mg/L	ng	ng	ng	ng	0.0004	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
Benzo(g,h,i)perylene	mg/L	ng	ng	ng	ng	0.0002	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
Benzo(c)phenanthrene	mg/L	ng	ng	ng	ng	ng	<0.000050	<0.000050	<0.000050	<0.000050	nc
Benzo(a)pyrene	mg/L	0.000015	ng	ng	ng	0.00081	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc
Benzo[e]pyrene	mg/L	ng	ng	ng	ng	ng	<0.000050	<0.000050	<0.000050	<0.000050	nc
Chrysene	mg/L	ng	ng	ng	ng	0.0001	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
Dibenz(a,h)anthracene	mg/L	ng	ng	ng	ng	0.00052	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc
Fluoranthene	mg/L	0.00004	ng	ng	ng	0.13	<0.000010	<0.000010	<0.000010	<0.000010	nc
Fluorene	mg/L	0.003	ng	ng	ng	0.4	<0.000050	<0.000050	<0.000050	<0.000050	nc
Indeno(1,2,3-cd)pyrene	mg/L	ng	ng	ng	ng	0.0002	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc
1-Methylnaphthalene	mg/L	ng	ng	ng	ng	1.8	<0.00010	<0.00010	<0.00010	<0.00010	nc
2-Methylnaphthalene	mg/L	ng	ng	ng	ng	1.8	<0.00010	<0.00010	<0.00010	<0.00010	nc
Naphthalene	mg/L	0.0011	ng	ng	ng	1.4	<0.00010	<0.00010	<0.00010	<0.00010	nc
Phenanthrene	mg/L	0.0004	ng	ng	ng	0.58	<0.000050	<0.000050	<0.000050	<0.000050	nc
Perylene	mg/L	ng	ng	ng	ng	ng	<0.000050	<0.000050	<0.000050	<0.000050	nc
Pyrene	mg/L	0.000025	ng	ng	ng	0.068	<0.000020	<0.000020	<0.000020	<0.000020	nc
Quinoline	mg/L	0.0034	ng	ng	ng	ng	<0.00020	<0.00020	<0.00020	<0.00020	nc
Total Metals											
Total Aluminum (Al)	mg/L	0.10	ng	ng	ng	ng	**0.12[A]**	0.10	0.02	0.021	2.1
Total Antimony (Sb)	mg/L	ng	ng	ng	ng	ng	<0.00060	<0.00060	<0.00060	<0.00060	nc
Total Arsenic (As)	mg/L	0.005	ng	ng	ng	ng	0.0035	0.00097	0.0043	0.0041	6.2
Total Barium (Ba)	mg/L	ng	ng	ng	ng	ng	0.026	0.036	<0.10	<0.10	nc
Total Beryllium (Be)	mg/L	ng	ng	ng	ng	ng	<0.0010	<0.0010	<0.0010	<0.0010	nc
Total Boron (B)	mg/L	1.5	ng	ng	ng	ng	0.8	0.28	**1.9[A]**	**2[A]**	8.0
Total Cadmium (Cd)	mg/L	0.00009	ng	ng	ng	ng	<0.000020	0.000078	0.000037	0.000041	nc
Total Calcium (Ca)	mg/L	ng	ng	ng	ng	ng	230	350	570	580	2.3
Total Chromium (Cr)	mg/L	ng	ng	ng	ng	ng	<0.0010	<0.0010	<0.0010	<0.0010	nc
Total Cobalt (Co)	mg/L	ng	ng	ng	ng	ng	0.0071	0.0062	0.04	0.041	4.2
Total Copper (Cu)	mg/L	0.004[F]	ng	ng	ng	ng	0.0022	**0.0068[A]**	0.0017	0.0019	10.3
Total Iron (Fe)	mg/L	0.3	ng	ng	ng	ng	**2.9[A]**	**0.56[A]**	**11[A]**	**11[A]**	0.0
Total Lead (Pb)	mg/L	0.007[F]	ng	ng	ng	ng	<0.00020	0.00022	0.00046	0.00049	0.0
Total Lithium (Li)	mg/L	ng	ng	ng	ng	ng	0.059	0.05	0.28	0.25	18.8
Total Magnesium (Mg)	mg/L	ng	ng	ng	ng	ng	160	250	1400	1500	12.1
Total Manganese (Mn)	mg/L	ng	ng	ng	ng	ng	0.61	1.1	0.95	0.96	1.1
Total Molybdenum (Mo)	mg/L	0.073	ng	ng	ng	ng	0.0055	0.005	0.0029	0.0029	0.0
Total Nickel (Ni)	mg/L	0.15[F]	ng	ng	ng	ng	0.04	0.014	0.048	0.049	2.6
Total Phosphorus (P)	mg/L	ng	ng	ng	ng	ng	<0.10	<0.10	<1.0	<1.0	nc
Total Potassium (K)	mg/L	ng	ng	ng	ng	ng	50	23	170	170	0.0
Total Selenium (Se)	mg/L	0.001	ng	ng	ng	ng	0.00043	0.00048	0.00049	0.00053	nc
Total Silicon (Si)	mg/L	ng	ng	ng	ng	ng	6.5	7.8	6.2	6	3.0
Total Silver (Ag)	mg/L	0.00025	ng	ng	ng	ng	<0.00010	<0.00010	0.00013	0.00012	nc
Total Sodium (Na)	mg/L	ng	ng	ng	ng	ng	350	420	5800	5900	3.2
Total Strontium (Sr)	mg/L	ng	ng	ng	ng	ng	0.51	0.62	3.2	3.2	0.0
Total Sulphur (S)	mg/L	ng	ng	ng	ng	ng	370	410	1100	1100	0.0
Total Thallium (Tl)	mg/L	0.0008	ng	ng	ng	ng	<0.00020	<0.00020	<0.00020	<0.00020	nc
Total Tin (Sn)	mg/L	ng	ng	ng	ng	ng	<0.0010	<0.0010	<0.0010	<0.0010	nc
Total Titanium (Ti)	mg/L	ng	ng	ng	ng	ng	0.01	0.0055	0.0022	0.0021	nc
Total Uranium (U)	mg/L	0.015	ng	ng	ng	ng	0.013	**0.03[A]**	**0.059[A]**	**0.059[A]**	0.0
Total Vanadium (V)	mg/L	ng	ng	ng	ng	ng	0.0019	0.0024	0.0026	0.0031	nc
Total Zinc (Zn)	mg/L	0.030	.0.5	ng	ng	ng	0.01	0.028	0.0055	0.0066	nc
Routine Parameters											
Routine Parameters - Calculated Parameters											
Anion Sum	meq/L	ng	ng	ng	ng	ng	42	57	370	390	nc
Cation Sum	meq/L	ng	ng	ng	ng	ng	43	56	410	410	nc
Hardness (CaCO3)	mg/L	ng	ng	ng	ng	ng	1300	1900	7300	7300	0.0
Ion Balance (% Difference)	%	ng	ng	ng	ng	ng	1	0.49	5	2	nc
Dissolved Nitrate (N)	mg/L	ng	ng	ng	ng	ng	1.3	0.41	<0.020	<0.020	nc
Dissolved Nitrate (NO3)	mg/L	13	ng	ng	ng	ng	5.5	1.8	<0.089	<0.089	nc
Dissolved Nitrite (NO2)	mg/L	0.06	ng	ng	ng	ng	0.055	<0.033	<0.033	<0.033	nc
Calculated Total Dissolved Solids	mg/L	ng	ng	ng	ng	ng	2600	3300	22000	23000	7.9
Routine Parameters - Miscellaneous Inorgamics											
Conductivity	uS/cm	ng	ng	ng	ng	ng	3700	4900	35000	35000	0.0
pH	pH	6.5-9.0	6-9	ng	ng	ng	7.71	7.54	7.37	7.38	nc

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Table 3 - 2018 Groundwater Analytical Results

Sample Location	Units	CWG[A]	NWB[B]	HC[C]	ECC[D]	MECP[E]	MW13-1	MW13-7	MW13-9	GW-QC-02	RPD (%)
Sample Date							09-Aug-18	10-Aug-18	09-Aug-18	Duplicate of MW13-9	
Sampling Company							Stantec	Stantec	Stantec		
Laboratory							Maxxam	Maxxam	Maxxam		
Routine Parameters - Anions											
Alkalinity (PP as CaCO3)	mg/L	ng	ng	ng	ng	ng	<1.0	<1.0	<1.0	<1.0	nc
Alkalinity (Total as CaCO3)	mg/L	ng	ng	ng	ng	ng	480	440	620	610	1.9
Bicarbonate (HCO3)	mg/L	ng	ng	ng	ng	ng	590	530	750	750	0.0
Carbonate (CO3)	mg/L	ng	ng	ng	ng	ng	<1.0	<1.0	<1.0	<1.0	nc
Hydroxide (OH)	mg/L	ng	ng	ng	ng	ng	<1.0	<1.0	<1.0	<1.0	nc
Dissolved Sulphate (SO4)	mg/L	ng	ng	ng	ng	ng	1100	1200	3200	3300	3.1
Dissolved Chloride (Cl)	mg/L	120	ng	ng	ng	2300	**330[A]**	**810[A]**	**10000[AE]**	**11000[AE]**	18.1
Routine Parameters - Nurtirents											
Dissolved Nitrite (N)	mg/L	ng	ng	ng	ng	ng	0.017	<0.010	<0.010	<0.010	nc
Dissolved Nitrate plus Nitrite (N)	mg/L	ng	ng	ng	ng	ng	1.3	0.41	<0.020	<0.020	nc
Routine Parameters - Lab Filtered Elements											
Dissolved Calcium (Ca)	mg/L	ng	ng	ng	ng	ng	240	350	580	570	2.3
Dissolved Iron (Fe)	mg/L	0.3	ng	ng	ng	ng	<0.060	0.06	<0.60	<0.60	nc
Dissolved Magnesium (Mg)	mg/L	ng	ng	ng	ng	ng	170	240	1400	1400	0.0
Dissolved Manganese (Mn)	mg/L	ng	ng	ng	ng	ng	0.62	1.1	0.93	0.92	1.1
Dissolved Potassium (K)	mg/L	ng	ng	ng	ng	ng	53	24	180	180	0.0
Dissolved Sodium (Na)	mg/L	ng	ng	ng	ng	2300	360	410	**6000[E]**	**5900[E]**	3.2
Inorganic Parameters											
Total Suspended Solids	mg/L	ng	ng	ng	ng	ng	11	9.3	32	35	13.7
Additional Nutrients											
Total Ammonia (N)	mg/L	3.98[G]	ng	ng	ng	ng	1.7	1.2	2.7	2.2	25.6
Miscellaneous Organics											
Extractable (n-Hex.) Oil and grease	mg/L	ng	ng	ng	ng	ng	<2.0	<2.0	<2.0	<2.0	nc
Phenols	mg/L	ng	ng	ng	ng	12	0.0063	0.0099	0.076	0.070	14.8
PFAS											
Perfluorobutane Sulfonate (PFBS)	ng/L	ng	ng	15000	ng	ng	9.2	7.9	<20	<20	nc
Perfluorobutanoic acid	ng/L	ng	ng	30000	ng	ng	<200	<200	<200	<200	nc
Perfluorodecane Sulfonate	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc
Perfluorodecanoic Acid (PFDA)	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc
Perfluorododecanoic Acid (PFDoA)	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc
Perfluoroheptane sulfonate	ng/L	ng	ng	ng	ng	ng	<2.0	2	<20	<20	nc
Perfluoroheptanoic Acid (PFHpA)	ng/L	ng	ng	200	ng	ng	43	18	39	41	5.7
Perfluorohexane Sulfonate (PFHxS)	ng/L	ng	ng	600	ng	ng	32	24	<20	23	nc
Perfluorohexanoic Acid (PFHxA)	ng/L	ng	ng	200	ng	ng	120	200	190	200	5.6
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	ng	ng	200	ng	ng	14	9.6	<20	<20	nc
Perfluorononanoic Acid (PFNA)	ng/L	ng	ng	20	ng	ng	4.7	<2.0	<20	<20	nc
Perfluorooctane Sulfonamide (PFOSA)	ng/L	ng	ng	ng	ng	ng	<4.0	<4.0	<4.0	<4.0	nc
Perfluorooctane Sulfonate (PFOS)	ng/L	ng	6800	600	6800	ng	15	54	28	29	3.2
Perfluoropentanoic Acid (PFPeA)	ng/L	ng	ng	200	ng	ng	170	**460[C]**	**630[C]**	**680[C]**	10.3
Perfluorotetradecanoic Acid	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc
Perfluorotridecanoic Acid	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc
Perfluoroundecanoic Acid (PFUnA)	ng/L	ng	ng	ng	ng	ng	<2.0	<2.0	<20	<20	nc

Notes:
[A] CCME. Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater.
[B] Nunavut Water Board. 2018. Licence No. 1-BR-FTA1828. Part E, Item 5.
[C] Health Canada. July 2018. Drinking Water Screening Values: Perfluoroalkylated Substances.
[D] Environment and Climate Change Canada. 2017. Federal Environmental Quality Guidelines for Perfluorooctanoic Sulfonate (PFOS).
[E] Ontario Ministry of the Environment and Climate Change (nor referred to as the Ministry of Environment, Conservation, and Parks). Soil, Groundwater, and Sediment Standards for use under Part XV.1 of the Environmental Protection Act. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition.
[F] Guideline is calculated based on hardness (CaCO3)
[G] Guideline is based on temperature and pH. The Ammonia (NH^3) guideline was multiplied by a factor of 0.8824 to calculate the Ammonia (N) guideline.

RPD	Relative percent difference. Calculated as the difference between the concentrations divided by their average, expressed as a percent.
%	Percent
mg/L	milligrams per litre
meq/L	milliequivalents per litre
µS/cm	microsiemens per centimetre
ng/L	nanograms per litre
ng	No Applicable guideline
nc	RPD could not be calculated as one or both of the concentrations were less than five times the laboratory reportable detection limit.
0.0043	Concentration exceeds applicable guideline
34.6	RPD exceeds industry standard
<0.060	Concentration is less than laboratory reportable detection Limit

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Table 4 - 2018 Soil Monitoring Results

Sample ID	Date	Depth (m BGS)	CHV (ppm)	IHV (ppm)	Texture
APR-S01	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt
APR-S02	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt
APR-S03	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt
APR-S04	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt
APR-S05	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt
APR-S06	13-Aug-18	0.0-0.3	0	0	Clayey, gravelly sand, some silt

Notes:

CHV	Combustible headspace vapour concentrations
IHV	Ionizable headspace vapour concentrations
m BGS	Metres below ground surface
ppm	parts per million

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Table 5 - 2018 Soil Analytical Results

Sample Location	Units	NWB[A]	APR-S01-0-0.3	APR-S02-0-0.3	APR-S03-0-0.3	APR-S-QC-01	RPD (%)	APR-S04-0-0.3	APR-S05-0-0.3	APR-S06-0-0.3
Sample Date			13-Aug-18	13-Aug-18	13-Aug-18	Duplicate of APR-S03		13-Aug-18	13-Aug-18	13-Aug-18
Sample Depth (mBGS)			0.0-0.3	0.0-0.3	0.0-0.3			0.0-0.3	0.0-0.3	0.0-0.3
Sampling Company			Stantec	Stantec	Stantec			Stantec	Stantec	Stantec
Laboratory			Maxxam	Maxxam	Maxxam			Maxxam	Maxxam	Maxxam
Petroleum Hydrocarbons										
Benzene	mg/kg	0.03	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	<0.010	<0.010	<0.010	<0.010	nc	<0.010	<0.010	<0.010
m & p-Xylene	mg/kg	ng	<0.040	<0.040	<0.040	<0.040	nc	<0.040	<0.040	<0.040
o-Xylene	mg/kg	ng	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020
Xylenes (Total)	mg/kg	11	<0.045	<0.045	<0.045	<0.045	nc	<0.045	<0.045	<0.045
F1 (C6-C10) - BTEX	mg/kg	320	<10	<10	<10	<10	nc	<10	<10	<10
F1 (C6-C10)	mg/kg	na	<10	<10	<10	<10	nc	<10	<10	<10
F2 (C10-C16 Hydrocarbons)	mg/kg	260	180	<10	16	<10	nc	47	<10	27
F3 (C16-C34 Hydrocarbons)	mg/kg	1700	150	150	1300	1100	17	550	780	83
F4 (C34-C50 Hydrocarbons)	mg/kg	3300	<50	<50	870	760	13	320	520	<50
Reached Baseline at C50	mg/kg	ng	Yes	Yes	Yes	Yes	nc	Yes	Yes	Yes
Metals										
Total Lead	mg/kg	600	8.5	8.1	6.6	6.6	0	12	5.7	6.7

Notes:
[A]Nunavut Water Board. 2018. Licence No. 1BR-FTA-1828. Part J. Table 1 - Remediation Requirements. Industrial Land Use. Excluding the protection of potable groundwater.

RPD	relative percent difference calculated as the difference between the two concentrations divided by their average and expressed as a percent.
mBGS	metres below ground surface
mg/kg	milligrams per kilogram
%	percent
-	parameter not analyzed
ng	no applicable guideline / standard
nc	RPD could not be calculated as one or both of the concentrations were less than five times the laboratory reportable detection limit.
<0.0050	Concentration is less than the laboratory reportable detection limit.
390[B]	Concentrations exceed applicable standard.
71	RPD exceeds industry standard.

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Table 6 - 2018 Quality Assurance / Quality Control - Blanks

Sample Location	Units	TRIP BLANK-02	FIELD BLANK-02	EQUIPMENT BLANK-02
Sample Date		09-Aug-18	09-Aug-18	14-Aug-18
Sampling Company		Stantec	Stantec	Stantec
Laboratory		Maxxam	Maxxam	Maxxam
Petroleum Hydrocarbons				
Benzene	mg/L	<0.00040	-	-
Toluene	mg/L	<0.00040	-	-
Ethylbenzene	mg/L	<0.00040	-	-
m & p-Xylene	mg/L	<0.00080	-	-
o-Xylene	mg/L	<0.00040	-	-
Xylenes (Total)	mg/L	<0.00089	-	-
F1 (C6-C10) - BTEX	mg/L	<0.10	-	-
F1 (C6-C10)	mg/L	<0.10	-	-
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	-	-
Polycyclic Aromatic Hydrocarbons				
Benzo[a]pyrene equivalency	mg/L	<0.000010	-	-
Acenaphthene	mg/L	<0.00010	-	-
Acenaphthylene	mg/L	<0.00010	-	-
Acridine	mg/L	<0.000050	-	-
Anthracene	mg/L	<0.000010	-	-
Benzo(a)anthracene	mg/L	<0.0000085	-	-
Benzo(b&j)fluoranthene	mg/L	<0.0000085	-	-
Benzo(k)fluoranthene	mg/L	<0.0000085	-	-
Benzo(g,h,i)perylene	mg/L	<0.0000085	-	-
Benzo(c)phenanthrene	mg/L	<0.000050	-	-
Benzo(a)pyrene	mg/L	<0.0000075	-	-
Benzo[e]pyrene	mg/L	<0.000050	-	-
Chrysene	mg/L	<0.0000085	-	-
Dibenz(a,h)anthracene	mg/L	<0.0000075	-	-
Fluoranthene	mg/L	<0.000010	-	-
Fluorene	mg/L	<0.000050	-	-
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	-	-
1-Methylnaphthalene	mg/L	<0.00010	-	-
2-Methylnaphthalene	mg/L	<0.00010	-	-
Naphthalene	mg/L	<0.00010	-	-
Phenanthrene	mg/L	<0.000050	-	-
Perylene	mg/L	<0.000050	-	-
Pyrene	mg/L	<0.000020	-	-
Quinoline	mg/L	<0.00020	-	-
Total Metals				
Total Aluminum (Al)	mg/L	<0.0030	-	-
Total Antimony (Sb)	mg/L	<0.00060	-	-
Total Arsenic (As)	mg/L	<0.00020	-	-
Total Barium (Ba)	mg/L	<0.010	-	-
Total Beryllium (Be)	mg/L	<0.0010	-	-
Total Boron (B)	mg/L	<0.020	-	-
Total Cadmium (Cd)	mg/L	<0.000020	-	-
Total Calcium (Ca)	mg/L	<0.30	-	-
Total Chromium (Cr)	mg/L	<0.0010	-	-
Total Cobalt (Co)	mg/L	<0.00030	-	-
Total Copper (Cu)	mg/L	<0.00020	-	-
Total Iron (Fe)	mg/L	<0.060	-	-
Total Lead (Pb)	mg/L	<0.00020	-	-
Total Lithium (Li)	mg/L	<0.020	-	-
Total Magnesium (Mg)	mg/L	<0.20	-	-
Total Manganese (Mn)	mg/L	<0.0040	-	-
Total Molybdenum (Mo)	mg/L	<0.00020	-	-
Total Nickel (Ni)	mg/L	<0.00050	-	-
Total Phosphorus (P)	mg/L	<0.10	-	-
Total Potassium (K)	mg/L	<0.30	-	-
Total Selenium (Se)	mg/L	<0.00020	-	-
Total Silicon (Si)	mg/L	<0.10	-	-
Total Silver (Ag)	mg/L	<0.00010	-	-
Total Sodium (Na)	mg/L	<0.50	-	-
Total Strontium (Sr)	mg/L	<0.020	-	-
Total Sulphur (S)	mg/L	<0.20	-	-
Total Thallium (Tl)	mg/L	<0.00020	-	-
Total Tin (Sn)	mg/L	<0.0010	-	-
Total Titanium (Ti)	mg/L	<0.0010	-	-
Total Uranium (U)	mg/L	<0.00010	-	-
Total Vanadium (V)	mg/L	<0.0010	-	-
Total Zinc (Zn)	mg/L	<0.0030	-	-
Routine Parameters				
Routine Parameters - Calculated Parameters				
Anion Sum	meq/L	0.0000	-	-
Cation Sum	meq/L	0.010	-	-
Hardness (CaCO3)	mg/L	<0.50	-	-
Ion Balance (% Difference)	%	NC	-	-
Dissolved Nitrate (N)	mg/L	<0.020	-	-
Dissolved Nitrate (NO3)	mg/L	<0.089	-	-
Dissolved Nitrite (NO2)	mg/L	<0.033	-	-
Calculated Total Dissolved Solids	mg/L	<0.022	-	-

Stantec

2018 Site Remedial Activities Supervision and Environmental Monitoring Program
Cambridge Bay Airport, Apron Area Land Treatment Unit and Excavation Area
Public Services and Procurement Canada for Transport Canada
110220176
Jan-19

Table 6 - 2018 Quality Assurance / Quality Control - Blanks

Sample Location	Units	TRIP BLANK-02	FIELD BLANK-02	EQUIPMENT BLANK-02
Sample Date		**09-Aug-18**	**09-Aug-18**	**14-Aug-18**
Sampling Company		**Stantec**	**Stantec**	**Stantec**
Laboratory		**Maxxam**	**Maxxam**	**Maxxam**
Routine Parameters - Miscellaneous Inorgamics				
Conductivity	uS/cm	<2.0	-	-
pH	pH	4.99	-	-
Routine Parameters - Anions				
Alkalinity (PP as CaCO3)	mg/L	<1.0	-	-
Alkalinity (Total as CaCO3)	mg/L	<1.0	-	-
Bicarbonate (HCO3)	mg/L	<1.0	-	-
Carbonate (CO3)	mg/L	<1.0	-	-
Hydroxide (OH)	mg/L	<1.0	-	-
Dissolved Sulphate (SO4)	mg/L	<1.0	-	-
Dissolved Chloride (Cl)	mg/L	<1.0	-	-
Routine Parameters - Nurtirents				
Dissolved Nitrite (N)	mg/L	<0.010	-	-
Dissolved Nitrate plus Nitrite (N)	mg/L	<0.020	-	-
Routine Parameters - Lab Filtered Elements				
Dissolved Calcium (Ca)	mg/L	<0.30	-	-
Dissolved Iron (Fe)	mg/L	<0.060	-	-
Dissolved Magnesium (Mg)	mg/L	<0.20	-	-
Dissolved Manganese (Mn)	mg/L	<0.0040	-	-
Dissolved Potassium (K)	mg/L	<0.30	-	-
Dissolved Sodium (Na)	mg/L	<0.50	-	-
Inorganic Parameters				
Total Suspended Solids	mg/L	<1.0	-	-
Additional Nutrients				
Total Ammonia (N)	mg/L	<0.015	-	-
Miscellaneous Organics				
Extractable (n-Hex.) Oil and grease	mg/L	<2.0	-	-
Phenols	mg/L	<0.0020	-	-
PFAS				
Perfluorobutane Sulfonate (PFBS)	ng/L	<2.0	<2.0	<2.0
Perfluorobutanoic Acid	ng/L	<2.0	<2.0	<2.0
Perfluorodecane Sulfonate	ng/L	<2.0	<2.0	<2.0
Perfluorodecanoic Acid (PFDA)	ng/L	<2.0	<2.0	<2.0
Perfluorododecanoic Acid (PFDoA)	ng/L	<2.0	<2.0	<2.0
Perfluoroheptane sulfonate	ng/L	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid (PFHpA)	ng/L	<2.0	<2.0	<2.0
Perfluorohexane Sulfonate (PFHxS)	ng/L	<2.0	<2.0	<2.0
Perfluorohexanoic Acid (PFHxA)	ng/L	<2.0	<2.0	<2.0
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	<2.0	<2.0	<2.0
Perfluorononanoic Acid (PFNA)	ng/L	<2.0	<2.0	<2.0
Perfluorooctane Sulfonamide (PFOSA)	ng/L	<4.0	<4.0	<4.0
Perfluorooctane Sulfonate (PFOS)	ng/L	<2.0	<2.0	<2.0
Perfluoropentanoic Acid (PFPeA)	ng/L	<2.0	<2.0	<2.0
Perfluorotetradecanoic Acid	ng/L	<2.0	<2.0	<2.0
Perfluorotridecanoic Acid	ng/L	<2.0	<2.0	<2.0
Ferfluoroudecanoic Acid (PFUnA)	ng/L	<2.0	<2.0	<2.0

Notes:

%	Percent
mg/L	milligrams per litre
meq/L	milliequivalents per litre
µS/cm	microsiemens per centimetre
ng/L	nanograms per litre
ng	No Applicable guideline
0.00031	Concentration exceeds laboratory reportable detection limit.

2018 Site Remedial Activities Supervision and Environmental Monitoring Program
Cambridge Bay Airport, Apron Area Land Treatment Unit and Excavation Area
Public Services and Procurement Canada for Transport Canada
110220176
Jan-19

Table 7 - GPS Locations of Soil Samples and Monitoring Wells

Location	Description	Easting	Northing
MW13-1	Monitoring Well	493350.26	7667539.98
MW13-2	Monitoring Well	493472.50	7666835.10
MW13-3	Monitoring Well	493501.60	7666786.20
MW13-4	Monitoring Well	493423.80	7666774.50
MW13-5	Monitoring Well	493401.60	7666642.90
MW13-6	Monitoring Well	Could Not Locate (Destroyed)	
MW13-7	Monitoring Well	495242.80	7666197.10
MW13-8	Monitoring Well	Could Not Locate (Destroyed)	
MW13-9	Monitoring Well	495209.70	7666152.30
APR-S01-0-0.3	Soil Sample	493384.90	7666822.40
APR-S02-0-0.3	Soil Sample	493390.40	7666851.20
APR-S03-0-0.3	Soil Sample	493430.00	7666833.30
APR-S04-0-0.3	Soil Sample	493423.10	7666806.50
APR-S05-0-0.3	Soil Sample	493477.00	7666817.30
APR-S06-0-0.3	Soil Sample	493455.70	7666790.30

Notes:
Latitude / Longitude expressed per NAD 83
GPS Model: garmin GPSMAP 62 So

APPENDIX D

Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your Project #: 110220176
Site#: B867489
Site Location: CBA APRON

Attention: Stantec Reporting

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
CANADA T6B 2R4

Report Date: 2018/08/30
Report #: R5380833
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8K6003
Received: 2018/08/13, 15:41

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Low level PFOS and PFOA by SPE/LCMS (1)	3	2018/08/22	2018/08/23	CAM SOP-00894	EPA 537 m
Low level PFOS and PFOA by SPE/LCMS (1)	1	2018/08/22	2018/08/24	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 110220176
Site#: B867489
Site Location: CBA APRON

Attention: Stantec Reporting

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
CANADA T6B 2R4

Report Date: 2018/08/30
Report #: R5380833
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8K6003
Received: 2018/08/13, 15:41

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Augustyna Dobosz, Project Manager
Email: ADobosz@maxxam.ca
Phone# (905)817-5700 Ext:5798

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

RESULTS OF ANALYSES OF WATER

Maxxam ID		HLP461		HLP462	HLP463		HLP464		
Sampling Date		2018/08/09 12:46		2018/08/09 15:18	2018/08/09		2018/08/10 09:08		
	UNITS	MW13-1	RDL	MW13-9	GW-QC-02	RDL	MW13-7	RDL	QC Batch
Miscellaneous Parameters									
Perfluorobutane Sulfonate (PFBS)	ng/L	9.2	2.0	<20	<20	20	7.9	2.0	5692616
Perfluorobutanoic acid	ng/L	<200 (1)	200	<200	<200	200	<200 (1)	200	5692616
Perfluorodecane Sulfonate	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluorodecanoic Acid (PFDA)	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluorododecanoic Acid (PFDoA)	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluoroheptane sulfonate	ng/L	<2.0	2.0	<20	<20	20	2.0	2.0	5692616
Perfluoroheptanoic Acid (PFHpA)	ng/L	43	2.0	39	41	20	18	2.0	5692616
Perfluorohexane Sulfonate (PFHxS)	ng/L	32	2.0	<20	23	20	24	2.0	5692616
Perfluorohexanoic Acid (PFHxA)	ng/L	120 (2)	20	190 (2)	200 (2)	20	200 (2)	20	5692616
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	14	2.0	<20	<20	20	9.6	2.0	5692616
Perfluorononanoic Acid (PFNA)	ng/L	4.7	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluorooctane Sulfonamide (PFOSA)	ng/L	<4.0 (3)	4.0	<4.0 (3)	<4.0 (3)	4.0	<4.0 (3)	4.0	5705537
Perfluorooctane Sulfonate (PFOS)	ng/L	15	2.0	28	29	20	54	2.0	5692616
Perfluoropentanoic Acid (PFPeA)	ng/L	170 (2)	20	630 (2)	680 (2)	20	460 (2)	20	5692616
Perfluorotetradecanoic Acid	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluorotridecanoic Acid	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Perfluoroundecanoic Acid (PFUnA)	ng/L	<2.0	2.0	<20	<20	20	<2.0	2.0	5692616
Surrogate Recovery (%)									
13C2-Perfluorodecanoic acid	%	90	N/A	78	73	N/A	92	N/A	5692616
13C2-Perfluorododecanoic acid	%	72	N/A	77	80	N/A	67	N/A	5692616
13C2-Perfluorohexanoic acid	%	87	N/A	90	91	N/A	93	N/A	5692616
13C2-perfluorotetradecanoic acid	%	54	N/A	75	78	N/A	42 (4)	N/A	5692616
13C2-Perfluoroundecanoic acid	%	76	N/A	81	79	N/A	78	N/A	5692616

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Due to sample matrix, sample required dilution. Detection limits were adjusted accordingly.

(2) Due to high concentration of the target analyte, sample required dilution. Detection limit was adjusted accordingly.

(3) Analysis was performed past the method defined holding time. Because of their chemical structure, PFCs are chemically and biologically stable in the environment and resist typical environmental degradation processes. This would suggest a hold time exceedance would not have a significant impact on the data.

(4) Extracted internal standard analyte recovery was below the defined lower control limit (LCL). Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low extracted internal standard analyte recovery.

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

RESULTS OF ANALYSES OF WATER

Maxxam ID		HLP461		HLP462	HLP463		HLP464		
Sampling Date		2018/08/09 12:46		2018/08/09 15:18	2018/08/09		2018/08/10 09:08		
	UNITS	MW13-1	RDL	MW13-9	GW-QC-02	RDL	MW13-7	RDL	QC Batch
13C4-Perfluorobutanoic acid	%	74	N/A	56	44 (1)	N/A	76	N/A	5692616
13C4-Perfluoroheptanoic acid	%	111	N/A	116	114	N/A	109	N/A	5692616
13C4-Perfluorooctanesulfonate	%	117	N/A	127	125	N/A	115	N/A	5692616
13C4-Perfluorooctanoic acid	%	115	N/A	122	129	N/A	109	N/A	5692616
13C5-Perfluorononanoic acid	%	119	N/A	127	127	N/A	111	N/A	5692616
13C5-Perfluoropentanoic acid	%	95	N/A	136	130	N/A	110	N/A	5692616
13C8-Perfluorooctane Sulfonamide	%	31	N/A	25	30	N/A	37	N/A	5705537
18O2-Perfluorohexanesulfonate	%	114	N/A	137	127	N/A	113	N/A	5692616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Extracted internal standard analyte recovery was below the defined lower control limit (LCL). Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low extracted internal standard analyte recovery.

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

GENERAL COMMENTS

Sample HLP462 [MW13-9] : Perfluorinated Compounds (PFCs): Due to sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample HLP463 [GW-QC-02] : Perfluorinated Compounds (PFCs): Due to sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample HLP461, Low level PFOS and PFOA by SPE/LCMS: Test repeated.
Sample HLP462, Low level PFOS and PFOA by SPE/LCMS: Test repeated.
Sample HLP463, Low level PFOS and PFOA by SPE/LCMS: Test repeated.
Sample HLP464, Low level PFOS and PFOA by SPE/LCMS: Test repeated.

Results relate only to the items tested.

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

QUALITY ASSURANCE REPORT

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5692616	13C2-Perfluorodecanoic acid	2018/08/23	91	50 - 150	91	%		
5692616	13C2-Perfluorododecanoic acid	2018/08/23	82	50 - 150	80	%		
5692616	13C2-Perfluorohexanoic acid	2018/08/23	86	50 - 150	90	%		
5692616	13C2-perfluorotetradecanoic acid	2018/08/23	75	50 - 150	74	%		
5692616	13C2-Perfluoroundecanoic acid	2018/08/23	85	50 - 150	81	%		
5692616	13C4-Perfluorobutanoic acid	2018/08/23	87	50 - 150	88	%		
5692616	13C4-Perfluoroheptanoic acid	2018/08/23	86	50 - 150	91	%		
5692616	13C4-Perfluorooctanesulfonate	2018/08/23	93	50 - 150	83	%		
5692616	13C4-Perfluorooctanoic acid	2018/08/23	91	50 - 150	89	%		
5692616	13C5-Perfluorononanoic acid	2018/08/23	88	50 - 150	94	%		
5692616	13C5-Perfluoropentanoic acid	2018/08/23	86	50 - 150	92	%		
5692616	18O2-Perfluorohexanesulfonate	2018/08/23	87	50 - 150	84	%		
5705537	13C8-Perfluorooctane Sulfonamide	2018/08/30	23	20 - 100	8.9 (1)			
5692616	Perfluorobutane Sulfonate (PFBS)	2018/08/23	110	70 - 130	<2.0	ng/L	0.93	30
5692616	Perfluorobutanoic acid	2018/08/23	98	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorodecane Sulfonate	2018/08/23	94	70 - 130	<2.0	ng/L	0.75	30
5692616	Perfluorodecanoic Acid (PFDA)	2018/08/23	94	70 - 130	<2.0	ng/L	2.5	30
5692616	Perfluorododecanoic Acid (PFDoA)	2018/08/23	98	70 - 130	<2.0	ng/L	1.6	30
5692616	Perfluoroheptane sulfonate	2018/08/23	99	70 - 130	<2.0	ng/L	1.1	30
5692616	Perfluoroheptanoic Acid (PFHpA)	2018/08/23	99	70 - 130	<2.0	ng/L	3.0	30
5692616	Perfluorohexane Sulfonate (PFHxS)	2018/08/23	100	70 - 130	<2.0	ng/L	2.2	30
5692616	Perfluorohexanoic Acid (PFHxA)	2018/08/23	104	70 - 130	<2.0	ng/L	0.86	30
5692616	Perfluoro-n-Octanoic Acid (PFOA)	2018/08/23	100	70 - 130	<2.0	ng/L	5.3	30
5692616	Perfluorononanoic Acid (PFNA)	2018/08/23	99	70 - 130	<2.0	ng/L	7.1	30
5692616	Perfluorooctane Sulfonate (PFOS)	2018/08/23	98	70 - 130	<2.0	ng/L	5.2	30
5692616	Perfluoropentanoic Acid (PFPeA)	2018/08/23	100	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorotetradecanoic Acid	2018/08/23	102	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorotridecanoic Acid	2018/08/23	109	70 - 130	<2.0	ng/L	0.74	30
5692616	Perfluoroundecanoic Acid (PFUnA)	2018/08/23	110	70 - 130	<2.0	ng/L	2.2	30

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

QUALITY ASSURANCE REPORT(CONT'D)

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5705537	Perfluorooctane Sulfonamide (PFOSA)	2018/08/30	104	70 - 130	<4.0	ng/L	6.2	30

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

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

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

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

(1) Extracted internal standard analyte recovery was below the defined lower control limit (LCL). Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low extracted internal standard analyte recovery.

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Maxxam Job #: B8K6003
Report Date: 2018/08/30

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

VALIDATION SIGNATURE PAGE

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

Colm McNamara, Senior Analyst, Liquid Chromatography

Sin Chii Chia, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: 110220176
Site Location: CBA APRON
Your C.O.C. #: M086443

Attention: LINDSAY VAN NOORTWYK

STANTEC CONSULTING LTD
10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/08/31
Report #: R2612318
Version: 3 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B867489
Received: 2018/08/12, 10:00

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2018/08/14	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2018/08/14	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	4	N/A	2018/08/15	AB SOP-00039	Auto Calc
Chloride by Automated Colourimetry	4	N/A	2018/08/15	AB SOP-00020	SM 22 4500-Cl-E m
Conductivity @25C	4	N/A	2018/08/14	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/08/14	2018/08/15	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	4	N/A	2018/08/14	AB WI-00065	Auto Calc
Elements by ICP-Dissolved-Lab Filtered (2)	4	N/A	2018/08/14	AB SOP-00042	EPA 6010d R4 m
Elements by ICP - Total	4	2018/08/17	2018/08/17	AB SOP-00014 / AB SOP-00042	EPA 6010d R4 m
Elements by ICPMS - Total	4	2018/08/17	2018/08/17	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m
Ion Balance	4	N/A	2018/08/14	AB WI-00065	Auto Calc
Sum of cations, anions	4	N/A	2018/08/14	AB WI-00065	Auto Calc
Ammonia-N (Total)	4	N/A	2018/08/14	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite	4	N/A	2018/08/14	AB WI-00065	Auto Calc
Nitrate (as N)	4	2018/08/13	2018/08/14	AB WI-00065	Auto Calc
NO2 - NO2 + NO3 (N) by CFA	4	N/A	2018/08/14	AB SOP-00082	IM 857-871m
Oil and Grease (Gravimetric, n-Hexane)	4	2018/08/14	2018/08/14	EENVSOP-00093	SM 23 5520B m
Benzo[a]pyrene Equivalency (3)	4	N/A	2018/08/15	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	2	2018/08/14	2018/08/14	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
PAH in Water by GC/MS	2	2018/08/14	2018/08/15	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
pH @25°C (4)	4	N/A	2018/08/14	AB SOP-00005	SM 23 4500 H+ B m
Phenols (4-AAP)	4	N/A	2018/08/17	EENVSOP-00061	MMCW 154 1996 m
Sulphate by Automated Colourimetry	4	N/A	2018/08/15	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	4	N/A	2018/08/15	AB WI-00065	Auto Calc
Total Suspended Solids (NFR)	4	2018/08/14	2018/08/15	AB SOP-00061	SM 23 2540 D m

Your Project #: 110220176
Site Location: CBA APRON
Your C.O.C. #: M086443

Attention: LINDSAY VAN NOORTWYK

STANTEC CONSULTING LTD
10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/08/31
Report #: R2612318
Version: 3 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B867489
Received: 2018/08/12, 10:00

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Silica gel clean up employed.
(2) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(3) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(4) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Geraldlyn Gouthro, Client Service Specialist
Email: GGouthro@maxxam.ca
Phone# (403)735-2230

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UB2927		UB2927		UB2928		UB2929			
Sampling Date		2018/08/09 12:46		2018/08/09 12:46		2018/08/09 15:18		2018/08/09			
COC Number		M086443		M086443		M086443		M086443			
	UNITS	MW13-1	MU	MW13-1 Lab-Dup	MU	MW13-9	MU	GW-QC-02	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9101176
Volatiles											
Benzene	mg/L	<0.00040	N/A	N/A	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9101419
Toluene	mg/L	<0.00040	N/A	N/A	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9101419
Ethylbenzene	mg/L	<0.00040	N/A	N/A	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9101419
m & p-Xylene	mg/L	<0.00080	N/A	N/A	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	9101419
o-Xylene	mg/L	<0.00040	N/A	N/A	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9101419
Xylenes (Total)	mg/L	<0.00089	N/A	N/A	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	9100051
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	9100051
F1 (C6-C10)	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	9101419
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	106	N/A	N/A	N/A	103	N/A	103	N/A	N/A	9101419
4-Bromofluorobenzene (sur.)	%	101	N/A	N/A	N/A	101	N/A	103	N/A	N/A	9101419
D4-1,2-Dichloroethane (sur.)	%	122	N/A	N/A	N/A	126	N/A	124	N/A	N/A	9101419
O-TERPHENYL (sur.)	%	116	N/A	113	N/A	111	N/A	133	N/A	N/A	9101176

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UB2930			
Sampling Date		2018/08/10 09:08			
COC Number		M086443			
	UNITS	MW13-7	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	0.10	9101176
Volatiles					
Benzene	mg/L	0.0031	+/- 0.00053	0.00040	9101419
Toluene	mg/L	<0.00040	N/A	0.00040	9101419
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	9101419
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	9101419
o-Xylene	mg/L	<0.00040	N/A	0.00040	9101419
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	9100051
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	9100051
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	9101419
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	104	N/A	N/A	9101419
4-Bromofluorobenzene (sur.)	%	100	N/A	N/A	9101419
D4-1,2-Dichloroethane (sur.)	%	127	N/A	N/A	9101419
O-TERPHENYL (sur.)	%	117	N/A	N/A	9101176

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		UB2927			UB2928		UB2929			
Sampling Date		2018/08/09 12:46			2018/08/09 15:18		2018/08/09			
COC Number		M086443			M086443		M086443			
	UNITS	MW13-1	MU	RDL	MW13-9	MU	GW-QC-02	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	42	N/A	N/A	370	N/A	390	N/A	N/A	9100060
Cation Sum	meq/L	43	N/A	N/A	410	N/A	410	N/A	N/A	9100060
Hardness (CaCO3)	mg/L	1300	N/A	0.50	7300	N/A	7300	N/A	0.50	9100057
Ion Balance (% Difference)	%	1.0	N/A	N/A	5.0	N/A	2.0	N/A	N/A	9100059
Dissolved Nitrate (N)	mg/L	1.3	N/A	0.020	<0.020	N/A	<0.020	N/A	0.020	9100065
Dissolved Nitrate (NO3)	mg/L	5.5	N/A	0.089	<0.089	N/A	<0.089	N/A	0.089	9100064
Dissolved Nitrite (NO2)	mg/L	0.055	N/A	0.033	<0.033	N/A	<0.033	N/A	0.033	9100064
Calculated Total Dissolved Solids	mg/L	2600	N/A	0.022	22000	N/A	23000	N/A	0.022	9100067
Misc. Inorganics										
Conductivity	uS/cm	3700	+/- 320	2.0	35000	+/- 3100	35000	+/- 3100	2.0	9101830
pH	pH	7.71	+/- 0.112	N/A	7.37	+/- 0.107	7.38	+/- 0.107	N/A	9101827
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	<1.0	N/A	1.0	9101829
Alkalinity (Total as CaCO3)	mg/L	480	+/- 21	1.0	620	+/- 27	610	+/- 26	1.0	9101829
Bicarbonate (HCO3)	mg/L	590	+/- 140	1.0	750	+/- 180	750	+/- 180	1.0	9101829
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	<1.0	N/A	1.0	9101829
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	<1.0	N/A	1.0	9101829
Dissolved Sulphate (SO4)	mg/L	1100 (1)	+/- 190	10	3200 (1)	+/- 530	3300 (1)	+/- 560	20	9102235
Dissolved Chloride (Cl)	mg/L	330 (1)	+/- 20	5.0	10000 (1)	+/- 630	11000 (1)	+/- 670	100	9102232
Nutrients										
Dissolved Nitrite (N)	mg/L	0.017	N/A	0.010	<0.010	N/A	<0.010	N/A	0.010	9101893
Dissolved Nitrate plus Nitrite (N)	mg/L	1.3	N/A	0.020	<0.020	N/A	<0.020	N/A	0.020	9101893
Lab Filtered Elements										
Dissolved Calcium (Ca)	mg/L	240	+/- 16	0.30	580	+/- 37	570	+/- 37	3.0	9101961
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.60	N/A	<0.60	N/A	0.60	9101961
Dissolved Magnesium (Mg)	mg/L	170	+/- 8.6	0.20	1400	+/- 74	1400	+/- 74	2.0	9101961
Dissolved Manganese (Mn)	mg/L	0.62	+/- 0.020	0.0040	0.93	+/- <RDL	0.92	+/- <RDL	0.040	9101961
Dissolved Potassium (K)	mg/L	53	+/- 3.2	0.30	180	+/- 11	180	+/- 11	3.0	9101961
Dissolved Sodium (Na)	mg/L	360	+/- 21	0.50	6000 (1)	+/- 350	5900 (1)	+/- 350	50	9101961

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		UB2930			
Sampling Date		2018/08/10 09:08			
COC Number		M086443			
	UNITS	MW13-7	MU	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	57	N/A	N/A	9100060
Cation Sum	meq/L	56	N/A	N/A	9100060
Hardness (CaCO3)	mg/L	1900	N/A	0.50	9100057
Ion Balance (% Difference)	%	0.49	N/A	N/A	9100059
Dissolved Nitrate (N)	mg/L	0.41	N/A	0.020	9100065
Dissolved Nitrate (NO3)	mg/L	1.8	N/A	0.089	9100064
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	9100064
Calculated Total Dissolved Solids	mg/L	3300	N/A	0.022	9100067
Misc. Inorganics					
Conductivity	uS/cm	4900	+/- 430	2.0	9101830
pH	pH	7.54	+/- 0.109	N/A	9101827
Anions					
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9101829
Alkalinity (Total as CaCO3)	mg/L	440	+/- 19	1.0	9101829
Bicarbonate (HCO3)	mg/L	530	+/- 130	1.0	9101829
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9101829
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9101829
Dissolved Sulphate (SO4)	mg/L	1200 (1)	+/- 200	10	9102235
Dissolved Chloride (Cl)	mg/L	810 (1)	+/- 50	5.0	9102232
Nutrients					
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	9101893
Dissolved Nitrate plus Nitrite (N)	mg/L	0.41	N/A	0.020	9101893
Lab Filtered Elements					
Dissolved Calcium (Ca)	mg/L	350	+/- 23	0.30	9101961
Dissolved Iron (Fe)	mg/L	0.060	+/- <RDL	0.060	9101961
Dissolved Magnesium (Mg)	mg/L	240	+/- 13	0.20	9101961
Dissolved Manganese (Mn)	mg/L	1.1	+/- 0.036	0.0040	9101961
Dissolved Potassium (K)	mg/L	24	+/- 1.5	0.30	9101961

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range

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Maxxam Job #: B867489
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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		UB2930			
Sampling Date		2018/08/10 09:08			
COC Number		M086443			
	UNITS	**MW13-7**	**MU**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	410	+/- 24	0.50	9101961
RDL = Reportable Detection Limit MU = Measurement Uncertainty					

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2927			UB2928			
Sampling Date		2018/08/09 12:46			2018/08/09 15:18			
COC Number		M086443			M086443			
	UNITS	MW13-1	MU	RDL	MW13-9	MU	RDL	QC Batch
Elements								
Total Aluminum (Al)	mg/L	0.12	+/- 0.025	0.0030	0.020	+/- 0.0096	0.0030	9106453
Total Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9106453
Total Arsenic (As)	mg/L	0.0035	+/- 0.00088	0.00020	0.0043	+/- 0.00098	0.00020	9106453
Total Barium (Ba)	mg/L	0.026	+/- <RDL	0.010	<0.10	N/A	0.10	9106454
Total Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9106453
Total Boron (B)	mg/L	0.80	+/- 0.060	0.020	1.9	+/- <RDL	0.20	9106454
Total Cadmium (Cd)	mg/L	<0.000020	N/A	0.000020	0.000037	+/- <RDL	0.000020	9106453
Total Calcium (Ca)	mg/L	230	+/- 24	0.30	570	+/- 58	3.0	9106454
Total Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9106453
Total Cobalt (Co)	mg/L	0.0071	+/- 0.00080	0.00030	0.040	+/- 0.0045	0.00030	9106453
Total Copper (Cu)	mg/L	0.0022	+/- 0.00049	0.00020	0.0017	+/- 0.00046	0.00020	9106453
Total Iron (Fe)	mg/L	2.9	+/- 0.33	0.060	11	+/- 1.3	0.60	9106454
Total Lead (Pb)	mg/L	<0.00020	N/A	0.00020	0.00046	+/- <RDL	0.00020	9106453
Total Lithium (Li)	mg/L	0.059	+/- <RDL	0.020	0.28	+/- <RDL	0.20	9106454
Total Magnesium (Mg)	mg/L	160	+/- 13	0.20	1400	+/- 120	2.0	9106454
Total Manganese (Mn)	mg/L	0.61	+/- 0.055	0.0040	0.95	+/- 0.086	0.040	9106454
Total Molybdenum (Mo)	mg/L	0.0055	+/- 0.00081	0.00020	0.0029	+/- 0.00054	0.00020	9106453
Total Nickel (Ni)	mg/L	0.040	+/- 0.0047	0.00050	0.048	+/- 0.0057	0.00050	9106453
Total Phosphorus (P)	mg/L	<0.10	N/A	0.10	<1.0	N/A	1.0	9106454
Total Potassium (K)	mg/L	50	+/- 5.0	0.30	170	+/- 17	3.0	9106454
Total Selenium (Se)	mg/L	0.00043	+/- <RDL	0.00020	0.00049	+/- <RDL	0.00020	9106453
Total Silicon (Si)	mg/L	6.5	+/- 0.67	0.10	6.2	+/- <RDL	1.0	9106454
Total Silver (Ag)	mg/L	<0.00010	N/A	0.00010	0.00013	+/- <RDL	0.00010	9106453
Total Sodium (Na)	mg/L	350	+/- 37	0.50	5800 (1)	+/- 620	50	9106454
Total Strontium (Sr)	mg/L	0.51	+/- 0.039	0.020	3.2	+/- 0.24	0.20	9106454
Total Sulphur (S)	mg/L	370	+/- 20	0.20	1100	+/- 60	2.0	9106454
Total Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9106453
Total Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9106453
Total Titanium (Ti)	mg/L	0.010	+/- 0.0021	0.0010	0.0022	+/- <RDL	0.0010	9106453

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2927			UB2928			
Sampling Date		2018/08/09 12:46			2018/08/09 15:18			
COC Number		M086443			M086443			
	UNITS	MW13-1	MU	RDL	MW13-9	MU	RDL	QC Batch
Total Uranium (U)	mg/L	0.013	+/- 0.0016	0.00010	0.059	+/- 0.0075	0.00010	9106453
Total Vanadium (V)	mg/L	0.0019	+/- 0.0017	0.0010	0.0026	+/- 0.0017	0.0010	9106453
Total Zinc (Zn)	mg/L	0.010	+/- 0.0030	0.0030	0.0055	+/- <RDL	0.0030	9106453

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

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Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2928		UB2929			
Sampling Date		2018/08/09 15:18		2018/08/09			
COC Number		M086443		M086443			
	UNITS	MW13-9 Lab-Dup	MU	GW-QC-02	MU	RDL	QC Batch
Elements							
Total Aluminum (Al)	mg/L	0.022	+/- 0.0097	0.021	+/- 0.0096	0.0030	9106453
Total Antimony (Sb)	mg/L	<0.00060	N/A	<0.00060	N/A	0.00060	9106453
Total Arsenic (As)	mg/L	0.0044	+/- 0.00099	0.0041	+/- 0.00096	0.00020	9106453
Total Barium (Ba)	mg/L	<0.10	N/A	<0.10	N/A	0.10	9106454
Total Beryllium (Be)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9106453
Total Boron (B)	mg/L	1.9	+/- <RDL	2.0	+/- <RDL	0.20	9106454
Total Cadmium (Cd)	mg/L	0.000043	+/- <RDL	0.000041	+/- <RDL	0.000020	9106453
Total Calcium (Ca)	mg/L	570	+/- 58	580	+/- 59	3.0	9106454
Total Chromium (Cr)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9106453
Total Cobalt (Co)	mg/L	0.041	+/- 0.0047	0.041	+/- 0.0046	0.00030	9106453
Total Copper (Cu)	mg/L	0.0020	+/- 0.00048	0.0019	+/- 0.00047	0.00020	9106453
Total Iron (Fe)	mg/L	11	+/- 1.3	11	+/- 1.3	0.60	9106454
Total Lead (Pb)	mg/L	0.00049	+/- <RDL	0.00049	+/- <RDL	0.00020	9106453
Total Lithium (Li)	mg/L	0.25	+/- <RDL	0.25	+/- <RDL	0.20	9106454
Total Magnesium (Mg)	mg/L	1500	+/- 120	1500	+/- 120	2.0	9106454
Total Manganese (Mn)	mg/L	0.96	+/- 0.087	0.96	+/- 0.087	0.040	9106454
Total Molybdenum (Mo)	mg/L	0.0029	+/- 0.00054	0.0029	+/- 0.00054	0.00020	9106453
Total Nickel (Ni)	mg/L	0.049	+/- 0.0058	0.049	+/- 0.0058	0.00050	9106453
Total Phosphorus (P)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9106454
Total Potassium (K)	mg/L	170	+/- 17	170	+/- 17	3.0	9106454
Total Selenium (Se)	mg/L	0.00052	+/- <RDL	0.00053	+/- <RDL	0.00020	9106453
Total Silicon (Si)	mg/L	6.2	+/- <RDL	6.0	+/- <RDL	1.0	9106454
Total Silver (Ag)	mg/L	0.00014	+/- <RDL	0.00012	+/- <RDL	0.00010	9106453
Total Sodium (Na)	mg/L	5800	+/- 620	5900 (1)	+/- 630	50	9106454
Total Strontium (Sr)	mg/L	3.2	+/- 0.25	3.2	+/- 0.24	0.20	9106454
Total Sulphur (S)	mg/L	1100	+/- 61	1100	+/- 61	2.0	9106454
Total Thallium (Tl)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	9106453
Total Tin (Sn)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9106453

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2928		UB2929			
Sampling Date		2018/08/09 15:18		2018/08/09			
COC Number		M086443		M086443			
	UNITS	MW13-9 Lab-Dup	MU	GW-QC-02	MU	RDL	QC Batch
Total Titanium (Ti)	mg/L	<0.0010	N/A	0.0021	+/- <RDL	0.0010	9106453
Total Uranium (U)	mg/L	0.059	+/- 0.0075	0.059	+/- 0.0075	0.00010	9106453
Total Vanadium (V)	mg/L	0.0029	+/- 0.0018	0.0031	+/- 0.0018	0.0010	9106453
Total Zinc (Zn)	mg/L	0.0056	+/- <RDL	0.0066	+/- <RDL	0.0030	9106453

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MU = Measurement Uncertainty
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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2930			
Sampling Date		2018/08/10 09:08			
COC Number		M086443			
	UNITS	MW13-7	MU	RDL	QC Batch
Elements					
Total Aluminum (Al)	mg/L	0.10	+/- 0.022	0.0030	9106453
Total Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9106453
Total Arsenic (As)	mg/L	0.00097	+/- 0.00063	0.00020	9106453
Total Barium (Ba)	mg/L	0.036	+/- <RDL	0.010	9106454
Total Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9106453
Total Boron (B)	mg/L	0.28	+/- 0.024	0.020	9106454
Total Cadmium (Cd)	mg/L	0.000078	+/- <RDL	0.000020	9106453
Total Calcium (Ca)	mg/L	350	+/- 36	0.30	9106454
Total Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9106453
Total Cobalt (Co)	mg/L	0.0062	+/- 0.00070	0.00030	9106453
Total Copper (Cu)	mg/L	0.0068	+/- 0.00098	0.00020	9106453
Total Iron (Fe)	mg/L	0.56	+/- 0.068	0.060	9106454
Total Lead (Pb)	mg/L	0.00022	+/- <RDL	0.00020	9106453
Total Lithium (Li)	mg/L	0.050	+/- <RDL	0.020	9106454
Total Magnesium (Mg)	mg/L	250	+/- 20	0.20	9106454
Total Manganese (Mn)	mg/L	1.1	+/- 0.10	0.0040	9106454
Total Molybdenum (Mo)	mg/L	0.0050	+/- 0.00074	0.00020	9106453
Total Nickel (Ni)	mg/L	0.014	+/- 0.0018	0.00050	9106453
Total Phosphorus (P)	mg/L	<0.10	N/A	0.10	9106454
Total Potassium (K)	mg/L	23	+/- 2.4	0.30	9106454
Total Selenium (Se)	mg/L	0.00048	+/- <RDL	0.00020	9106453
Total Silicon (Si)	mg/L	7.8	+/- 0.81	0.10	9106454
Total Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9106453
Total Sodium (Na)	mg/L	420	+/- 45	0.50	9106454
Total Strontium (Sr)	mg/L	0.62	+/- 0.047	0.020	9106454
Total Sulphur (S)	mg/L	410	+/- 22	0.20	9106454
Total Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9106453
Total Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9106453
Total Titanium (Ti)	mg/L	0.0055	+/- 0.0012	0.0010	9106453
Total Uranium (U)	mg/L	0.030	+/- 0.0038	0.00010	9106453

RDL = Reportable Detection Limit
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N/A = Not Applicable

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2930			
Sampling Date		2018/08/10 09:08			
COC Number		M086443			
	UNITS	**MW13-7**	**MU**	**RDL**	**QC Batch**
Total Vanadium (V)	mg/L	0.0024	+/- 0.0017	0.0010	9106453
Total Zinc (Zn)	mg/L	0.028	+/- 0.0055	0.0030	9106453

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Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		UB2927				UB2928		UB2929			
Sampling Date		2018/08/09 12:46				2018/08/09 15:18		2018/08/09			
COC Number		M086443				M086443		M086443			
	UNITS	MW13-1	MU	RDL	QC Batch	MW13-9	MU	GW-QC-02	MU	RDL	QC Batch
Misc. Inorganics											
Total Suspended Solids	mg/L	11	+/- 1.0	1.0	9101221	32	+/- 2.9	35	+/- 3.1	1.0	9101221
Nutrients											
Total Ammonia (N)	mg/L	1.7	+/- 0.15	0.015	9101643	2.7 (1)	+/- 0.23	2.2 (1)	+/- 0.19	0.075	9101643
Misc. Organics											
Extractable (n-Hex.) Oil and grease	mg/L	<2.0	N/A	2.0	9101842	<2.0	N/A	<2.0	N/A	2.0	9101842
Phenols	mg/L	0.0063	+/- <RDL	0.0020	9106764	0.076 (2)	+/- <RDL	0.070 (2)	+/- <RDL	0.020	9106774

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MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam ID		UB2930		UB2930			
Sampling Date		2018/08/10 09:08		2018/08/10 09:08			
COC Number		M086443		M086443			
	UNITS	MW13-7	MU	MW13-7 Lab-Dup	MU	RDL	QC Batch
Misc. Inorganics							
Total Suspended Solids	mg/L	9.3	+/- <RDL	N/A	N/A	1.0	9101221
Nutrients							
Total Ammonia (N)	mg/L	1.2	+/- 0.11	N/A	N/A	0.015	9101643
Misc. Organics							
Extractable (n-Hex.) Oil and grease	mg/L	<2.0	N/A	N/A	N/A	2.0	9101842
Phenols	mg/L	0.0099	+/- <RDL	0.0074	+/- <RDL	0.0020	9106774

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N/A = Not Applicable

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UB2927		UB2927		UB2928			
Sampling Date		2018/08/09 12:46		2018/08/09 12:46		2018/08/09 15:18			
COC Number		M086443		M086443		M086443			
	UNITS	MW13-1	MU	MW13-1 Lab-Dup	MU	MW13-9	MU	RDL	QC Batch
Polycyclic Aromatics									
Benzo[a]pyrene equivalency	mg/L	<0.000010	N/A	N/A	N/A	<0.000010	N/A	0.000010	9099738
Acenaphthene	mg/L	<0.00010	N/A	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Acenaphthylene	mg/L	<0.00010	N/A	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Acridine	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Anthracene	mg/L	<0.000010	N/A	<0.000010	N/A	<0.000010	N/A	0.000010	9101169
Benzo(a)anthracene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(b&j)fluoranthene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(k)fluoranthene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(g,h,i)perylene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(c)phenanthrene	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Benzo(a)pyrene	mg/L	<0.0000075	N/A	<0.0000075	N/A	<0.0000075	N/A	0.0000075	9101169
Benzo[e]pyrene	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Chrysene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Dibenz(a,h)anthracene	mg/L	<0.0000075	N/A	<0.0000075	N/A	<0.0000075	N/A	0.0000075	9101169
Fluoranthene	mg/L	<0.000010	N/A	<0.000010	N/A	<0.000010	N/A	0.000010	9101169
Fluorene	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	N/A	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
1-Methylnaphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
2-Methylnaphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Naphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Phenanthrene	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Perylene	mg/L	<0.000050	N/A	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Pyrene	mg/L	<0.000020	N/A	<0.000020	N/A	<0.000020	N/A	0.000020	9101169
Quinoline	mg/L	<0.00020	N/A	<0.00020	N/A	<0.00020	N/A	0.00020	9101169
Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	118	N/A	116	N/A	112	N/A	N/A	9101169
D8-ACENAPHTHYLENE (sur.)	%	105	N/A	103	N/A	100	N/A	N/A	9101169
D8-NAPHTHALENE (sur.)	%	76	N/A	75	N/A	72	N/A	N/A	9101169
TERPHENYL-D14 (sur.)	%	107	N/A	118	N/A	102	N/A	N/A	9101169

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Site Location: CBA APRON
Sampler Initials: LA

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UB2929		UB2930			
Sampling Date		2018/08/09		2018/08/10 09:08			
COC Number		M086443		M086443			
	UNITS	GW-QC-02	MU	MW13-7	MU	RDL	QC Batch
Polycyclic Aromatics							
Benzo[a]pyrene equivalency	mg/L	<0.000010	N/A	<0.000010	N/A	0.000010	9099738
Acenaphthene	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Acenaphthylene	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Acridine	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Anthracene	mg/L	<0.000010	N/A	<0.000010	N/A	0.000010	9101169
Benzo(a)anthracene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(b&j)fluoranthene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(k)fluoranthene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(g,h,i)perylene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Benzo(c)phenanthrene	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Benzo(a)pyrene	mg/L	<0.0000075	N/A	<0.0000075	N/A	0.0000075	9101169
Benzo[e]pyrene	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Chrysene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
Dibenz(a,h)anthracene	mg/L	<0.0000075	N/A	<0.0000075	N/A	0.0000075	9101169
Fluoranthene	mg/L	<0.000010	N/A	<0.000010	N/A	0.000010	9101169
Fluorene	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	N/A	<0.0000085	N/A	0.0000085	9101169
1-Methylnaphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
2-Methylnaphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Naphthalene	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9101169
Phenanthrene	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Perylene	mg/L	<0.000050	N/A	<0.000050	N/A	0.000050	9101169
Pyrene	mg/L	<0.000020	N/A	<0.000020	N/A	0.000020	9101169
Quinoline	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	9101169
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	108	N/A	106	N/A	N/A	9101169
D8-ACENAPHTHYLENE (sur.)	%	93	N/A	91	N/A	N/A	9101169
D8-NAPHTHALENE (sur.)	%	65	N/A	59	N/A	N/A	9101169
TERPHENYL-D14 (sur.)	%	99	N/A	90	N/A	N/A	9101169

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C

Sample UB2928 [MW13-9] : Detection limits raised due to sample matrix. Parameters affected are dissolved Ca, Fe, K, Mg, Mn and Total B, Ba, Ca, Fe, K, Li, Mg, Mn, P, S, Si, Sr.

Sample UB2929 [GW-QC-02] : Detection limits raised due to sample matrix. Parameters affected are dissolved Ca, Fe, K, Mg, Mn and Total B, Ba, Ca, Fe, K, Li, Mg, Mn, P, S, Si, Sr.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9101169	BC5	Matrix Spike [UB2929-08]	D10-ANTHRACENE (sur.)	2018/08/14		113	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		98	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		68	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		107	%	50 - 130
			Acenaphthene	2018/08/14		88	%	50 - 130
			Acenaphthylene	2018/08/14		95	%	50 - 130
			Acridine	2018/08/14		104	%	50 - 130
			Anthracene	2018/08/14		101	%	50 - 130
			Benzo(a)anthracene	2018/08/14		102	%	50 - 130
			Benzo(b&j)fluoranthene	2018/08/14		94	%	50 - 130
			Benzo(k)fluoranthene	2018/08/14		105	%	50 - 130
			Benzo(g,h,i)perylene	2018/08/14		85	%	50 - 130
			Benzo(c)phenanthrene	2018/08/14		121	%	50 - 130
			Benzo(a)pyrene	2018/08/14		96	%	50 - 130
			Benzo[e]pyrene	2018/08/14		100	%	50 - 130
			Chrysene	2018/08/14		108	%	50 - 130
			Dibenz(a,h)anthracene	2018/08/14		79	%	50 - 130
			Fluoranthene	2018/08/14		121	%	50 - 130
			Fluorene	2018/08/14		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/08/14		78	%	50 - 130
			1-Methylnaphthalene	2018/08/14		74	%	50 - 130
			2-Methylnaphthalene	2018/08/14		73	%	50 - 130
			Naphthalene	2018/08/14		77	%	50 - 130
			Phenanthrene	2018/08/14		97	%	50 - 130
			Perylene	2018/08/14		84	%	50 - 130
			Pyrene	2018/08/14		118	%	50 - 130
			Quinoline	2018/08/14		106	%	50 - 130
9101169	BC5	Spiked Blank	D10-ANTHRACENE (sur.)	2018/08/14		122	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		102	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		74	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		141 (1)	%	50 - 130
			Acenaphthene	2018/08/14		93	%	50 - 130
			Acenaphthylene	2018/08/14		100	%	50 - 130
			Acridine	2018/08/14		107	%	50 - 130
			Anthracene	2018/08/14		106	%	50 - 130
			Benzo(a)anthracene	2018/08/14		120	%	50 - 130
			Benzo(b&j)fluoranthene	2018/08/14		109	%	50 - 130
			Benzo(k)fluoranthene	2018/08/14		120	%	50 - 130
			Benzo(g,h,i)perylene	2018/08/14		99	%	50 - 130
			Benzo(c)phenanthrene	2018/08/14		128	%	50 - 130
			Benzo(a)pyrene	2018/08/14		111	%	50 - 130
			Benzo[e]pyrene	2018/08/14		119	%	50 - 130
			Chrysene	2018/08/14		122	%	50 - 130
			Dibenz(a,h)anthracene	2018/08/14		92	%	50 - 130
			Fluoranthene	2018/08/14		132 (1)	%	50 - 130
			Fluorene	2018/08/14		101	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/08/14		91	%	50 - 130
			1-Methylnaphthalene	2018/08/14		76	%	50 - 130
			2-Methylnaphthalene	2018/08/14		75	%	50 - 130
			Naphthalene	2018/08/14		77	%	50 - 130
			Phenanthrene	2018/08/14		102	%	50 - 130
			Perylene	2018/08/14		96	%	50 - 130

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			Pyrene	2018/08/14		138 (1)	%	50 - 130
			Quinoline	2018/08/14		104	%	50 - 130
9101169	BC5	Method Blank	D10-ANTHRACENE (sur.)	2018/08/14		116	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		92	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		61	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		142 (1)		50 - 130
			Acenaphthene	2018/08/14	<0.00010		mg/L	
			Acenaphthylene	2018/08/14	<0.00010		mg/L	
			Acridine	2018/08/14	<0.000050		mg/L	
			Anthracene	2018/08/14	<0.000010		mg/L	
			Benzo(a)anthracene	2018/08/14	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/08/14	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/08/14	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/08/14	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/08/14	<0.000050		mg/L	
			Benzo(a)pyrene	2018/08/14	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/08/14	<0.000050		mg/L	
			Chrysene	2018/08/14	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/08/14	<0.0000075		mg/L	
			Fluoranthene	2018/08/14	<0.000010		mg/L	
			Fluorene	2018/08/14	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/08/14	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/08/14	<0.00010		mg/L	
			2-Methylnaphthalene	2018/08/14	<0.00010		mg/L	
			Naphthalene	2018/08/14	<0.00010		mg/L	
			Phenanthrene	2018/08/14	<0.000050		mg/L	
			Perylene	2018/08/14	<0.000050		mg/L	
			Pyrene	2018/08/14	<0.000020		mg/L	
			Quinoline	2018/08/14	<0.00020		mg/L	
9101169	BC5	RPD [UB2927-08]	Acenaphthene	2018/08/14	NC		%	30
			Acenaphthylene	2018/08/14	NC		%	30
			Acridine	2018/08/14	NC		%	30
			Anthracene	2018/08/14	NC		%	30
			Benzo(a)anthracene	2018/08/14	NC		%	30
			Benzo(b&j)fluoranthene	2018/08/14	NC		%	30
			Benzo(k)fluoranthene	2018/08/14	NC		%	30
			Benzo(g,h,i)perylene	2018/08/14	NC		%	30
			Benzo(c)phenanthrene	2018/08/14	NC		%	30
			Benzo(a)pyrene	2018/08/14	NC		%	30
			Benzo[e]pyrene	2018/08/14	NC		%	30
			Chrysene	2018/08/14	NC		%	30
			Dibenz(a,h)anthracene	2018/08/14	NC		%	30
			Fluoranthene	2018/08/14	NC		%	30
			Fluorene	2018/08/14	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/08/14	NC		%	30
			1-Methylnaphthalene	2018/08/14	NC		%	30
			2-Methylnaphthalene	2018/08/14	NC		%	30
			Naphthalene	2018/08/14	NC		%	30
			Phenanthrene	2018/08/14	NC		%	30
			Perylene	2018/08/14	NC		%	30
			Pyrene	2018/08/14	NC		%	30
			Quinoline	2018/08/14	NC		%	30

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9101176	KHO	Matrix Spike [UB2928-08]	O-TERPHENYL (sur.)	2018/08/15		110	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15		107	%	60 - 140
9101176	KHO	Spiked Blank	O-TERPHENYL (sur.)	2018/08/15		114	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15		109	%	60 - 140
9101176	KHO	Method Blank	O-TERPHENYL (sur.)	2018/08/15		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15	<0.10		mg/L	
9101176	KHO	RPD [UB2927-08]	F2 (C10-C16 Hydrocarbons)	2018/08/15	NC		%	30
9101221	LCA	Matrix Spike	Total Suspended Solids	2018/08/15		118	%	80 - 120
9101221	LCA	Spiked Blank	Total Suspended Solids	2018/08/15		100	%	80 - 120
9101221	LCA	Method Blank	Total Suspended Solids	2018/08/15	<1.0		mg/L	
9101221	LCA	RPD	Total Suspended Solids	2018/08/15	0		%	20
9101419	SES	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/08/14		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/14		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/14		121	%	50 - 140
			Benzene	2018/08/14		89	%	50 - 140
			Toluene	2018/08/14		81	%	50 - 140
			Ethylbenzene	2018/08/14		90	%	50 - 140
			m & p-Xylene	2018/08/14		87	%	50 - 140
			o-Xylene	2018/08/14		90	%	50 - 140
			F1 (C6-C10)	2018/08/14		78	%	60 - 140
9101419	SES	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/14		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/14		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/14		122	%	50 - 140
			Benzene	2018/08/14		91	%	60 - 130
			Toluene	2018/08/14		82	%	60 - 130
			Ethylbenzene	2018/08/14		90	%	60 - 130
			m & p-Xylene	2018/08/14		88	%	60 - 130
			o-Xylene	2018/08/14		93	%	60 - 130
			F1 (C6-C10)	2018/08/14		86	%	60 - 140
9101419	SES	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/14		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/14		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/14		122	%	50 - 140
			Benzene	2018/08/14	<0.00040		mg/L	
			Toluene	2018/08/14	<0.00040		mg/L	
			Ethylbenzene	2018/08/14	<0.00040		mg/L	
			m & p-Xylene	2018/08/14	<0.00080		mg/L	
			o-Xylene	2018/08/14	<0.00040		mg/L	
			F1 (C6-C10)	2018/08/14	<0.10		mg/L	
9101419	SES	RPD	Benzene	2018/08/14	NC		%	30
			Toluene	2018/08/14	NC		%	30
			Ethylbenzene	2018/08/14	NC		%	30
			m & p-Xylene	2018/08/14	NC		%	30
			o-Xylene	2018/08/14	NC		%	30
			F1 (C6-C10)	2018/08/14	NC		%	30
9101643	AL2	Matrix Spike	Total Ammonia (N)	2018/08/14		103	%	80 - 120
9101643	AL2	Spiked Blank	Total Ammonia (N)	2018/08/14		102	%	80 - 120
9101643	AL2	Method Blank	Total Ammonia (N)	2018/08/14	<0.015		mg/L	
9101643	AL2	RPD	Total Ammonia (N)	2018/08/14	17		%	20
9101827	MA4	Spiked Blank	pH	2018/08/14		100	%	97 - 103
9101827	MA4	RPD	pH	2018/08/14	0.42		%	N/A
9101829	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2018/08/14		100	%	80 - 120
9101829	MA4	Method Blank	Alkalinity (PP as CaCO3)	2018/08/14	<1.0		mg/L	

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			Alkalinity (Total as CaCO3)	2018/08/14	<1.0		mg/L	
			Bicarbonate (HCO3)	2018/08/14	<1.0		mg/L	
			Carbonate (CO3)	2018/08/14	<1.0		mg/L	
			Hydroxide (OH)	2018/08/14	<1.0		mg/L	
9101829	MA4	RPD	Alkalinity (PP as CaCO3)	2018/08/14	NC		%	20
			Alkalinity (Total as CaCO3)	2018/08/14	1.7		%	20
			Bicarbonate (HCO3)	2018/08/14	1.7		%	20
			Carbonate (CO3)	2018/08/14	NC		%	20
			Hydroxide (OH)	2018/08/14	NC		%	20
9101830	MA4	Spiked Blank	Conductivity	2018/08/14		101	%	90 - 110
9101830	MA4	Method Blank	Conductivity	2018/08/14	<2.0		uS/cm	
9101830	MA4	RPD	Conductivity	2018/08/14	0.59		%	10
9101842	GG3	Spiked Blank	Extractable (n-Hex.) Oil and grease	2018/08/14		98	%	70 - 130
9101842	GG3	Method Blank	Extractable (n-Hex.) Oil and grease	2018/08/14	<2.0		mg/L	
9101893	AF6	Matrix Spike	Dissolved Nitrite (N)	2018/08/14		102	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/08/14		NC	%	80 - 120
9101893	AF6	Spiked Blank	Dissolved Nitrite (N)	2018/08/14		102	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/08/14		95	%	80 - 120
9101893	AF6	Method Blank	Dissolved Nitrite (N)	2018/08/14	<0.010		mg/L	
			Dissolved Nitrate plus Nitrite (N)	2018/08/14	<0.020		mg/L	
9101893	AF6	RPD	Dissolved Nitrite (N)	2018/08/14	0.82		%	20
			Dissolved Nitrate plus Nitrite (N)	2018/08/14	0.060		%	20
9101961	JK9	Matrix Spike	Dissolved Calcium (Ca)	2018/08/14		95	%	80 - 120
			Dissolved Iron (Fe)	2018/08/14		98	%	80 - 120
			Dissolved Magnesium (Mg)	2018/08/14		98	%	80 - 120
			Dissolved Manganese (Mn)	2018/08/14		99	%	80 - 120
			Dissolved Potassium (K)	2018/08/14		102	%	80 - 120
			Dissolved Sodium (Na)	2018/08/14		101	%	80 - 120
9101961	JK9	Spiked Blank	Dissolved Calcium (Ca)	2018/08/14		99	%	80 - 120
			Dissolved Iron (Fe)	2018/08/14		97	%	80 - 120
			Dissolved Magnesium (Mg)	2018/08/14		99	%	80 - 120
			Dissolved Manganese (Mn)	2018/08/14		98	%	80 - 120
			Dissolved Potassium (K)	2018/08/14		100	%	80 - 120
			Dissolved Sodium (Na)	2018/08/14		101	%	80 - 120
9101961	JK9	Method Blank	Dissolved Calcium (Ca)	2018/08/14	<0.30		mg/L	
			Dissolved Iron (Fe)	2018/08/14	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2018/08/14	<0.20		mg/L	
			Dissolved Manganese (Mn)	2018/08/14	<0.0040		mg/L	
			Dissolved Potassium (K)	2018/08/14	<0.30		mg/L	
			Dissolved Sodium (Na)	2018/08/14	<0.50		mg/L	
9101961	JK9	RPD	Dissolved Calcium (Ca)	2018/08/14	0.69		%	20
			Dissolved Iron (Fe)	2018/08/14	NC		%	20
			Dissolved Magnesium (Mg)	2018/08/14	1.0		%	20
			Dissolved Manganese (Mn)	2018/08/14	0.17		%	20
			Dissolved Potassium (K)	2018/08/14	0.37		%	20
			Dissolved Sodium (Na)	2018/08/14	1.5		%	20
9102232	MRD	Matrix Spike	Dissolved Chloride (Cl)	2018/08/15		109	%	80 - 120
9102232	MRD	Spiked Blank	Dissolved Chloride (Cl)	2018/08/15		110	%	80 - 120
9102232	MRD	Method Blank	Dissolved Chloride (Cl)	2018/08/15	<1.0		mg/L	
9102232	MRD	RPD	Dissolved Chloride (Cl)	2018/08/15	NC		%	20
9102235	MRD	Matrix Spike	Dissolved Sulphate (SO4)	2018/08/15		107	%	80 - 120
9102235	MRD	Spiked Blank	Dissolved Sulphate (SO4)	2018/08/15		106	%	80 - 120

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9102235	MRD	Method Blank	Dissolved Sulphate (SO4)	2018/08/15	<1.0		mg/L	
9102235	MRD	RPD	Dissolved Sulphate (SO4)	2018/08/15	NC		%	20
9106453	JHS	Matrix Spike	Total Aluminum (Al)	2018/08/17		94	%	80 - 120
			Total Antimony (Sb)	2018/08/17		95	%	80 - 120
			Total Arsenic (As)	2018/08/17		97	%	80 - 120
			Total Beryllium (Be)	2018/08/17		96	%	80 - 120
			Total Cadmium (Cd)	2018/08/17		94	%	80 - 120
			Total Chromium (Cr)	2018/08/17		101	%	80 - 120
			Total Cobalt (Co)	2018/08/17		100	%	80 - 120
			Total Copper (Cu)	2018/08/17		99	%	80 - 120
			Total Lead (Pb)	2018/08/17		96	%	80 - 120
			Total Molybdenum (Mo)	2018/08/17		98	%	80 - 120
			Total Nickel (Ni)	2018/08/17		98	%	80 - 120
			Total Selenium (Se)	2018/08/17		97	%	80 - 120
			Total Silver (Ag)	2018/08/17		96	%	80 - 120
			Total Thallium (Tl)	2018/08/17		99	%	80 - 120
			Total Tin (Sn)	2018/08/17		96	%	80 - 120
			Total Titanium (Ti)	2018/08/17		97	%	80 - 120
			Total Uranium (U)	2018/08/17		97	%	80 - 120
			Total Vanadium (V)	2018/08/17		102	%	80 - 120
			Total Zinc (Zn)	2018/08/17		96	%	80 - 120
9106453	JHS	Spiked Blank	Total Aluminum (Al)	2018/08/17		101	%	80 - 120
			Total Antimony (Sb)	2018/08/17		97	%	80 - 120
			Total Arsenic (As)	2018/08/17		99	%	80 - 120
			Total Beryllium (Be)	2018/08/17		99	%	80 - 120
			Total Cadmium (Cd)	2018/08/17		96	%	80 - 120
			Total Chromium (Cr)	2018/08/17		102	%	80 - 120
			Total Cobalt (Co)	2018/08/17		102	%	80 - 120
			Total Copper (Cu)	2018/08/17		99	%	80 - 120
			Total Lead (Pb)	2018/08/17		98	%	80 - 120
			Total Molybdenum (Mo)	2018/08/17		100	%	80 - 120
			Total Nickel (Ni)	2018/08/17		98	%	80 - 120
			Total Selenium (Se)	2018/08/17		101	%	80 - 120
			Total Silver (Ag)	2018/08/17		98	%	80 - 120
			Total Thallium (Tl)	2018/08/17		98	%	80 - 120
			Total Tin (Sn)	2018/08/17		96	%	80 - 120
			Total Titanium (Ti)	2018/08/17		101	%	80 - 120
			Total Uranium (U)	2018/08/17		97	%	80 - 120
			Total Vanadium (V)	2018/08/17		104	%	80 - 120
			Total Zinc (Zn)	2018/08/17		98	%	80 - 120
9106453	JHS	Method Blank	Total Aluminum (Al)	2018/08/17	<0.0030		mg/L	
			Total Antimony (Sb)	2018/08/17	<0.00060		mg/L	
			Total Arsenic (As)	2018/08/17	<0.00020		mg/L	
			Total Beryllium (Be)	2018/08/17	<0.0010		mg/L	
			Total Cadmium (Cd)	2018/08/17	<0.000020		mg/L	
			Total Chromium (Cr)	2018/08/17	<0.0010		mg/L	
			Total Cobalt (Co)	2018/08/17	<0.00030		mg/L	
			Total Copper (Cu)	2018/08/17	<0.00020		mg/L	
			Total Lead (Pb)	2018/08/17	<0.00020		mg/L	
			Total Molybdenum (Mo)	2018/08/17	<0.00020		mg/L	
			Total Nickel (Ni)	2018/08/17	<0.00050		mg/L	
			Total Selenium (Se)	2018/08/17	<0.00020		mg/L	

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			Total Silver (Ag)	2018/08/17	<0.00010		mg/L	
			Total Thallium (Tl)	2018/08/17	<0.00020		mg/L	
			Total Tin (Sn)	2018/08/17	<0.0010		mg/L	
			Total Titanium (Ti)	2018/08/17	<0.0010		mg/L	
			Total Uranium (U)	2018/08/17	<0.00010		mg/L	
			Total Vanadium (V)	2018/08/17	<0.0010		mg/L	
			Total Zinc (Zn)	2018/08/17	<0.0030		mg/L	
9106453	JHS	RPD [UB2928-04]	Total Aluminum (Al)	2018/08/17	8.9		%	20
			Total Antimony (Sb)	2018/08/17	NC		%	20
			Total Arsenic (As)	2018/08/17	2.3		%	20
			Total Beryllium (Be)	2018/08/17	NC		%	20
			Total Cadmium (Cd)	2018/08/17	15		%	20
			Total Chromium (Cr)	2018/08/17	NC		%	20
			Total Cobalt (Co)	2018/08/17	2.6		%	20
			Total Copper (Cu)	2018/08/17	18		%	20
			Total Lead (Pb)	2018/08/17	5.5		%	20
			Total Molybdenum (Mo)	2018/08/17	0.38		%	20
			Total Nickel (Ni)	2018/08/17	2.6		%	20
			Total Selenium (Se)	2018/08/17	6.4		%	20
			Total Silver (Ag)	2018/08/17	9.5		%	20
			Total Thallium (Tl)	2018/08/17	NC		%	20
			Total Tin (Sn)	2018/08/17	NC		%	20
			Total Titanium (Ti)	2018/08/17	NC		%	20
			Total Uranium (U)	2018/08/17	0.50		%	20
			Total Vanadium (V)	2018/08/17	10		%	20
			Total Zinc (Zn)	2018/08/17	1.5		%	20
9106454	ACY	Matrix Spike [UB2927-04]	Total Barium (Ba)	2018/08/17		87	%	80 - 120
			Total Boron (B)	2018/08/17		91	%	80 - 120
			Total Calcium (Ca)	2018/08/17		NC	%	80 - 120
			Total Iron (Fe)	2018/08/17		NC	%	80 - 120
			Total Lithium (Li)	2018/08/17		91	%	80 - 120
			Total Magnesium (Mg)	2018/08/17		NC	%	80 - 120
			Total Manganese (Mn)	2018/08/17		89	%	80 - 120
			Total Phosphorus (P)	2018/08/17		94	%	80 - 120
			Total Potassium (K)	2018/08/17		NC	%	80 - 120
			Total Silicon (Si)	2018/08/17		95	%	80 - 120
			Total Sodium (Na)	2018/08/17		NC	%	80 - 120
			Total Strontium (Sr)	2018/08/17		87	%	80 - 120
9106454	ACY	Spiked Blank	Total Barium (Ba)	2018/08/17		95	%	80 - 120
			Total Boron (B)	2018/08/17		98	%	80 - 120
			Total Calcium (Ca)	2018/08/17		97	%	80 - 120
			Total Iron (Fe)	2018/08/17		99	%	80 - 120
			Total Lithium (Li)	2018/08/17		96	%	80 - 120
			Total Magnesium (Mg)	2018/08/17		98	%	80 - 120
			Total Manganese (Mn)	2018/08/17		97	%	80 - 120
			Total Phosphorus (P)	2018/08/17		96	%	80 - 120
			Total Potassium (K)	2018/08/17		96	%	80 - 120
			Total Silicon (Si)	2018/08/17		100	%	80 - 120
			Total Sodium (Na)	2018/08/17		98	%	80 - 120
			Total Strontium (Sr)	2018/08/17		97	%	80 - 120
9106454	ACY	Method Blank	Total Barium (Ba)	2018/08/17	<0.010		mg/L	
			Total Boron (B)	2018/08/17	<0.020		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B867489
Report Date: 2018/08/31

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Calcium (Ca)	2018/08/17	<0.30		mg/L	
			Total Iron (Fe)	2018/08/17	<0.060		mg/L	
			Total Lithium (Li)	2018/08/17	<0.020		mg/L	
			Total Magnesium (Mg)	2018/08/17	<0.20		mg/L	
			Total Manganese (Mn)	2018/08/17	<0.0040		mg/L	
			Total Phosphorus (P)	2018/08/17	<0.10		mg/L	
			Total Potassium (K)	2018/08/17	<0.30		mg/L	
			Total Silicon (Si)	2018/08/17	<0.10		mg/L	
			Total Sodium (Na)	2018/08/17	<0.50		mg/L	
			Total Strontium (Sr)	2018/08/17	<0.020		mg/L	
			Total Sulphur (S)	2018/08/17	<0.20		mg/L	
9106454	ACY	RPD [UB2928-04]	Total Barium (Ba)	2018/08/17	NC		%	20
			Total Boron (B)	2018/08/17	0.32		%	20
			Total Calcium (Ca)	2018/08/17	1.2		%	20
			Total Iron (Fe)	2018/08/17	2.2		%	20
			Total Lithium (Li)	2018/08/17	11		%	20
			Total Magnesium (Mg)	2018/08/17	1.6		%	20
			Total Manganese (Mn)	2018/08/17	1.4		%	20
			Total Phosphorus (P)	2018/08/17	NC		%	20
			Total Potassium (K)	2018/08/17	1.6		%	20
			Total Silicon (Si)	2018/08/17	1.1		%	20
			Total Sodium (Na)	2018/08/17	0.13		%	20
			Total Strontium (Sr)	2018/08/17	1.5		%	20
			Total Sulphur (S)	2018/08/17	2.1		%	20
9106764	YY	Matrix Spike	Phenols	2018/08/17		98	%	80 - 120
9106764	YY	Spiked Blank	Phenols	2018/08/17		91	%	80 - 120
9106764	YY	Method Blank	Phenols	2018/08/17	<0.0020		mg/L	
9106764	YY	RPD	Phenols	2018/08/17	NC		%	20
9106774	YY	Matrix Spike [UB2930-07]	Phenols	2018/08/17		100	%	80 - 120
9106774	YY	Spiked Blank	Phenols	2018/08/17		93	%	80 - 120
9106774	YY	Method Blank	Phenols	2018/08/17	<0.0020		mg/L	
9106774	YY	RPD [UB2930-07]	Phenols	2018/08/17	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

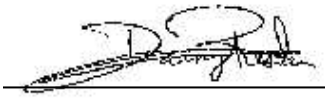
Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B867489
Report Date: 2018/08/31

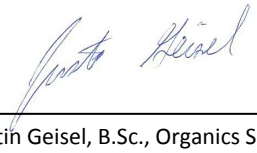
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Sampler Initials: LA

VALIDATION SIGNATURE PAGE

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

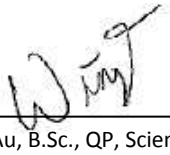


Daniel Reslan, cCT, QP, Organics Manager



Justin Geisel, B.Sc., Organics Supervisor

Poonam Sharma, cCT, Organics Supervisor



Winnie Au, B.Sc., QP, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

CHAIN OF CUSTODY RECORD

M086443

Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: Stantec	Company:	Quotation #:	[x] 5 - 7 Days Regular (Most analyses)
Contact Name: Lindsay Van Noortwyk	Contact Name:	P.O. #/ AFE#: 110220176	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 10160 112 St NW Edmonton AB T5K 2L6	Address:	Project #: 110220176	Rush TAT (Surcharges will be applied)
Phone: 780 232 1114	Phone:	Site Location: CBA Apron	[ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3-4 Days
Email: Lindsay.VanNoortwyk@stantec.com	Email:	Site #:	Date Required:
Copies:	Copies:	Sampled By: LA	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID	Temp
Seal Present	✓			3 2 3
Seal Intact	✓			
Cooling Media	✓			
Seal Present	✓			1 1 2
Seal Intact	✓			
Cooling Media	✓			
Seal Present				
Seal Intact				
Cooling Media				

Depot Reception

RECEIVED IN YELLOWKNIFE
By: [signature] Loreta Mendoza
2018 -08- 12 10:00
ice yes
sealed yes

Temp: 7 4

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☐ Tot ☒ Diss	Mercury ☐ Total ☐ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	TSS	Nitrogen/Ammonia	Oil & Grease (Total)	Total Phenols	PAH	PFAS LIT Parameter	Low Detection Limit			HOLD - DO NOT ANALYZE
1	MW13-1		2018/08/09	1246	W	15		x		x	x						x	x	x	x	x	x				
2	MW13-9		↓	1518	W	15		x		x	x						x	x	x	x	x	x				
3	GW-QC-02		2018/08/09	—	W	15		x		x	x						x	x	x	x	x	x				
4	MW13-7		2018/08/10	908	W	15		x		x	x						x	x	x	x	x	x				
5																										
6																										
7																										
8																										
9																										
10																										
	Please indicate Filtered, Preserved or Both (F, P, F/P)										P															

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water
- [ ] D50 (Drilling Waste)
- [ ] Saskatchewan
- [ ] Other:

Special Instructions

No bottles field filtered, lab filter as req'd

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
[signature] Luke Anderson	2018/08/10	1005	[signature] RACHEL BERNARD	2018/08/13	11:19	B867487 9
						D-120180813

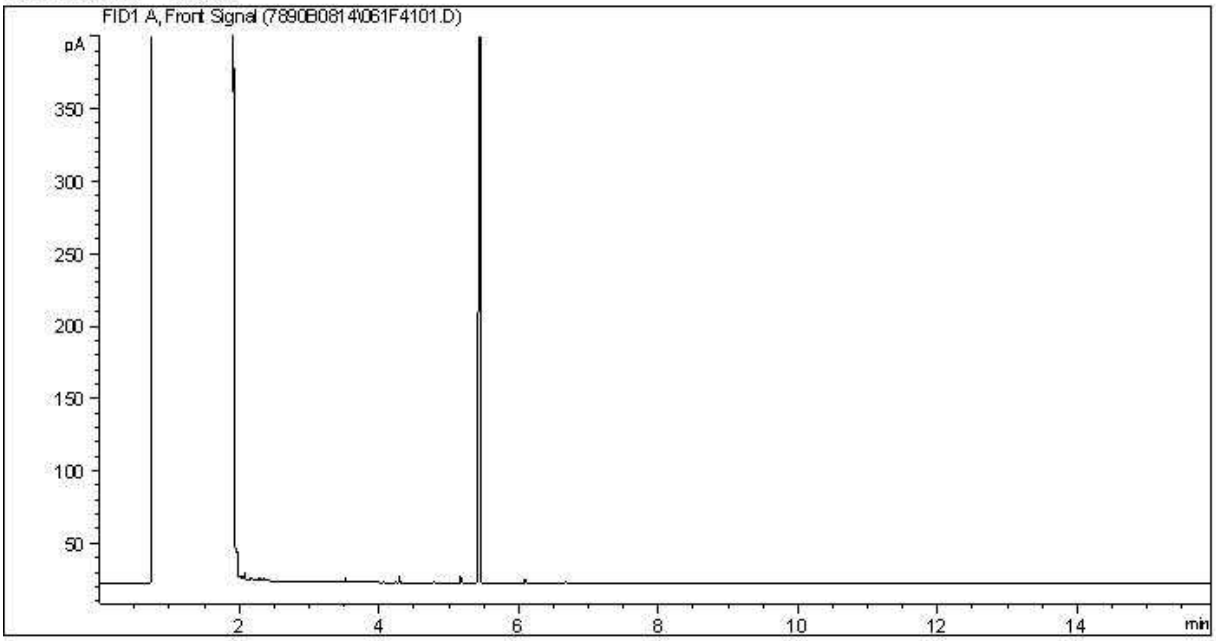
AB FCD-00331/7

Maxxam Job #: B867489
Report Date: 2018/08/31
Maxxam Sample: UB2927

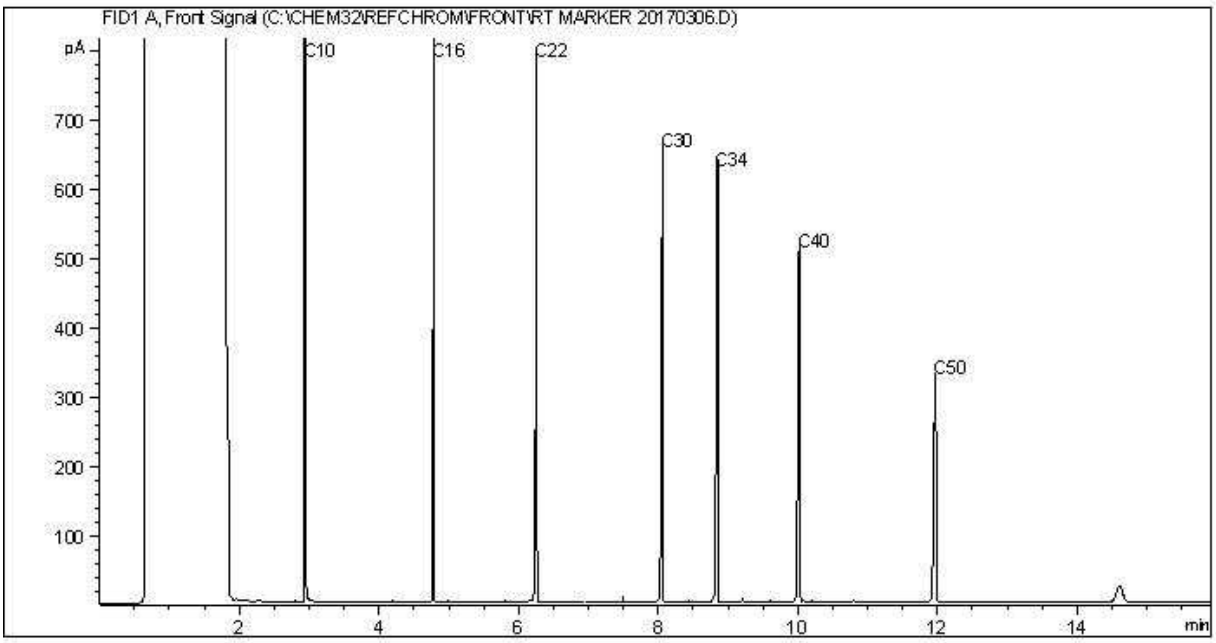
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: MW13-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

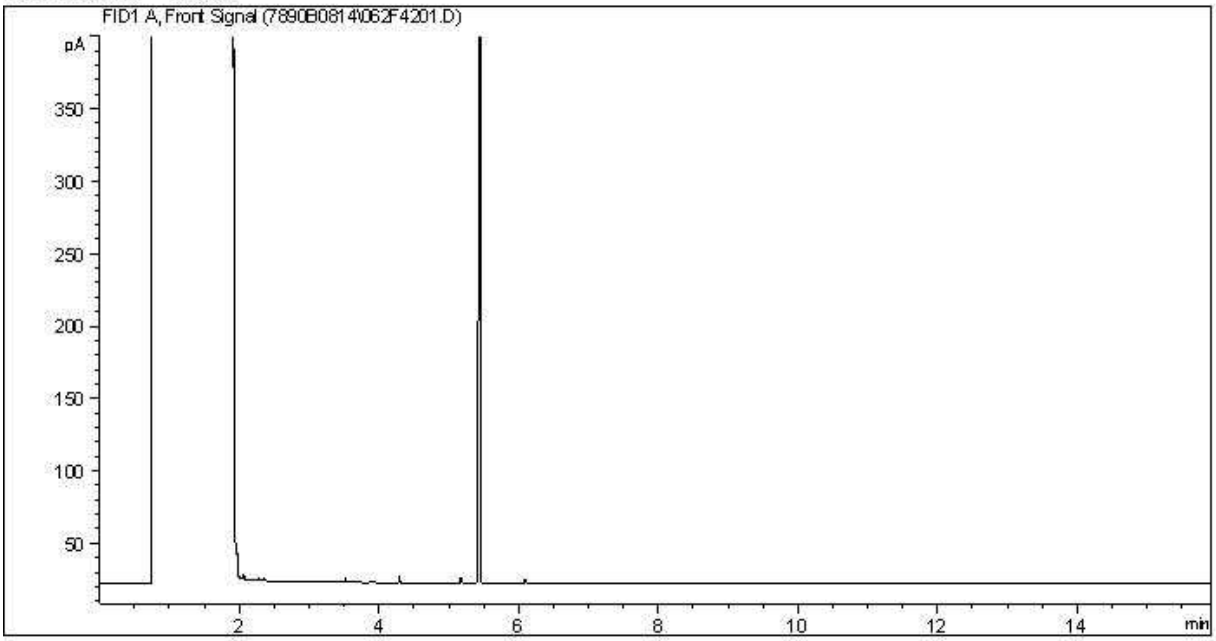
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B867489
Report Date: 2018/08/31
Maxxam Sample: UB2927 Lab-Dup

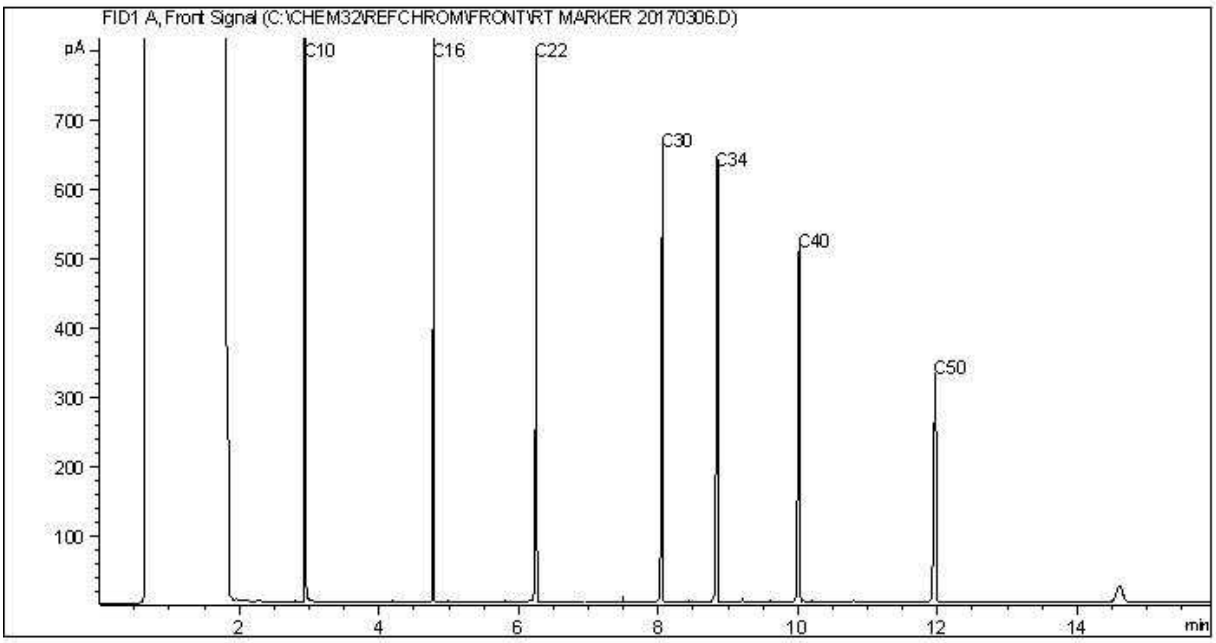
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: MW13-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

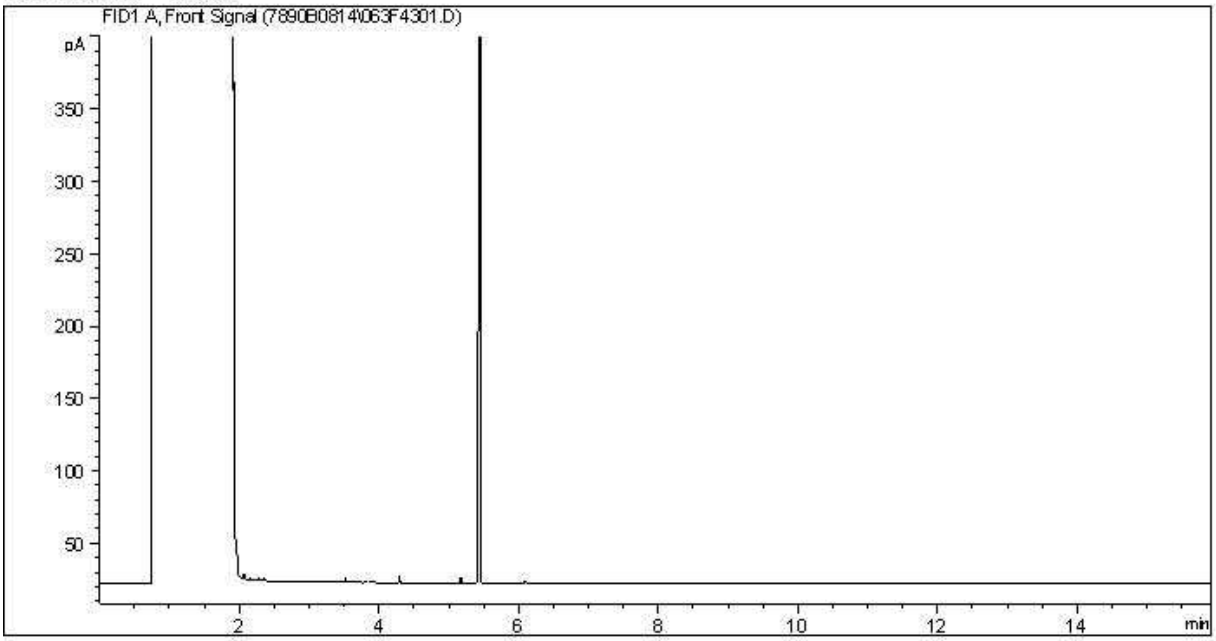
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B867489
Report Date: 2018/08/31
Maxxam Sample: UB2928

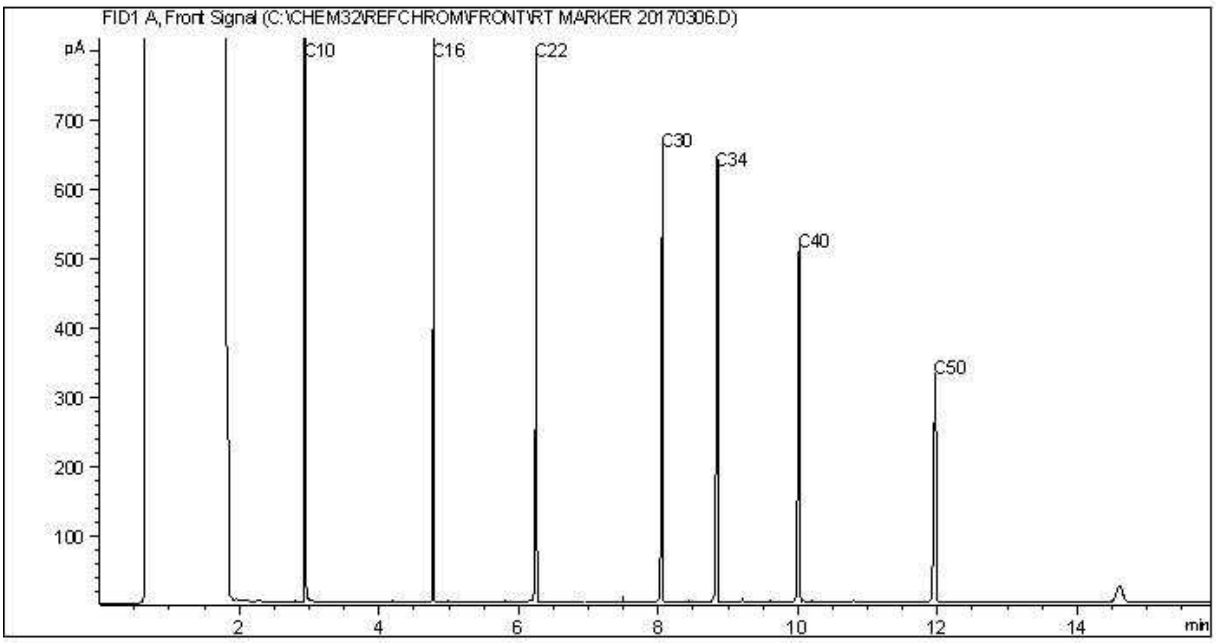
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: MW13-9

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

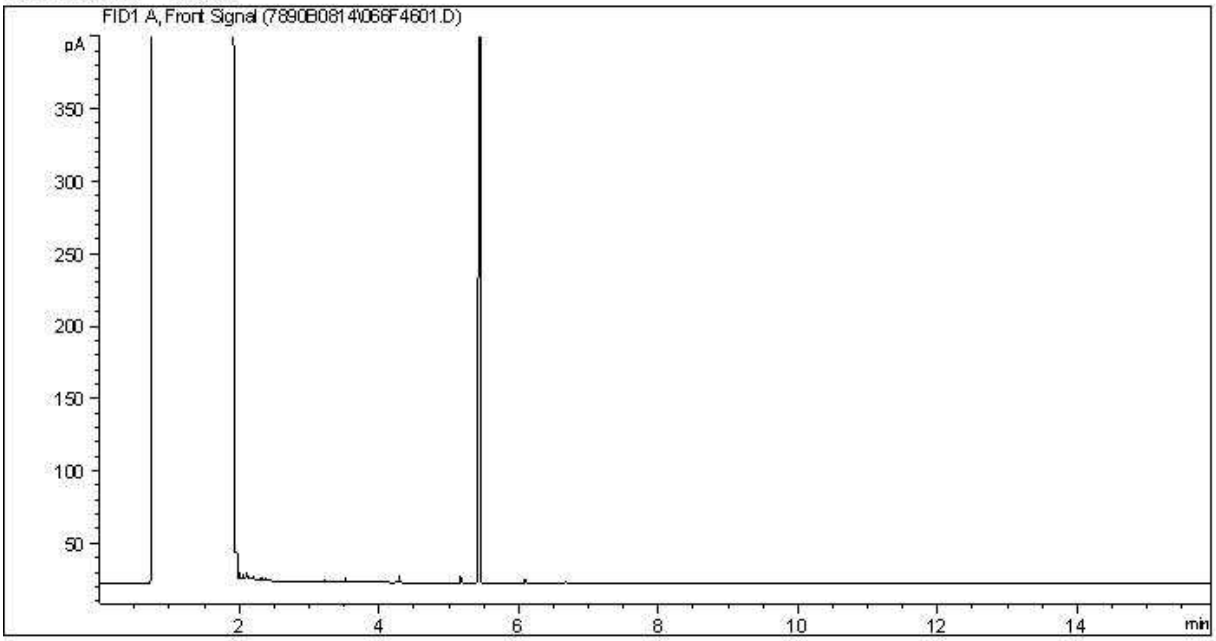
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B867489
Report Date: 2018/08/31
Maxxam Sample: UB2929

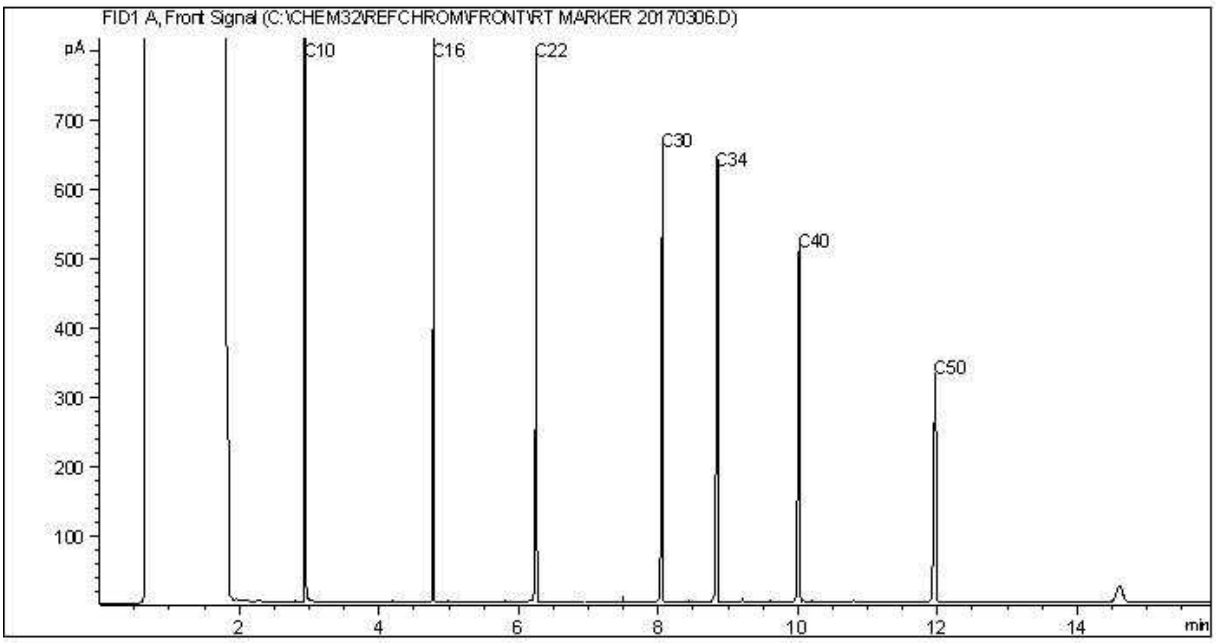
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: GW-QC-02

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

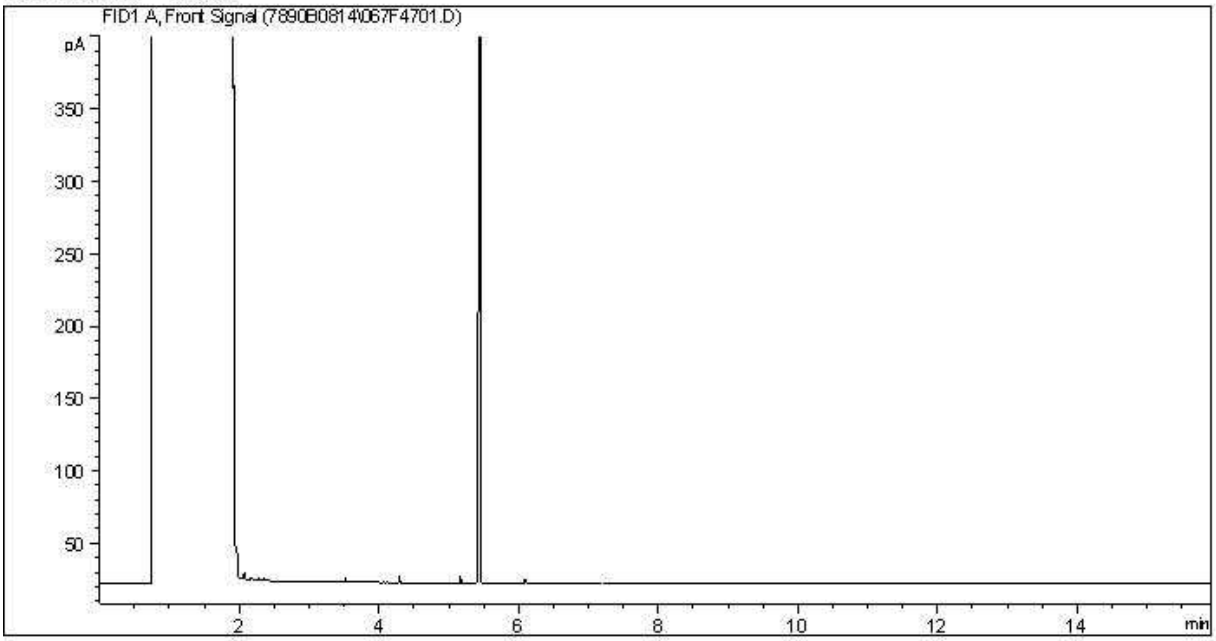
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B867489
Report Date: 2018/08/31
Maxxam Sample: UB2930

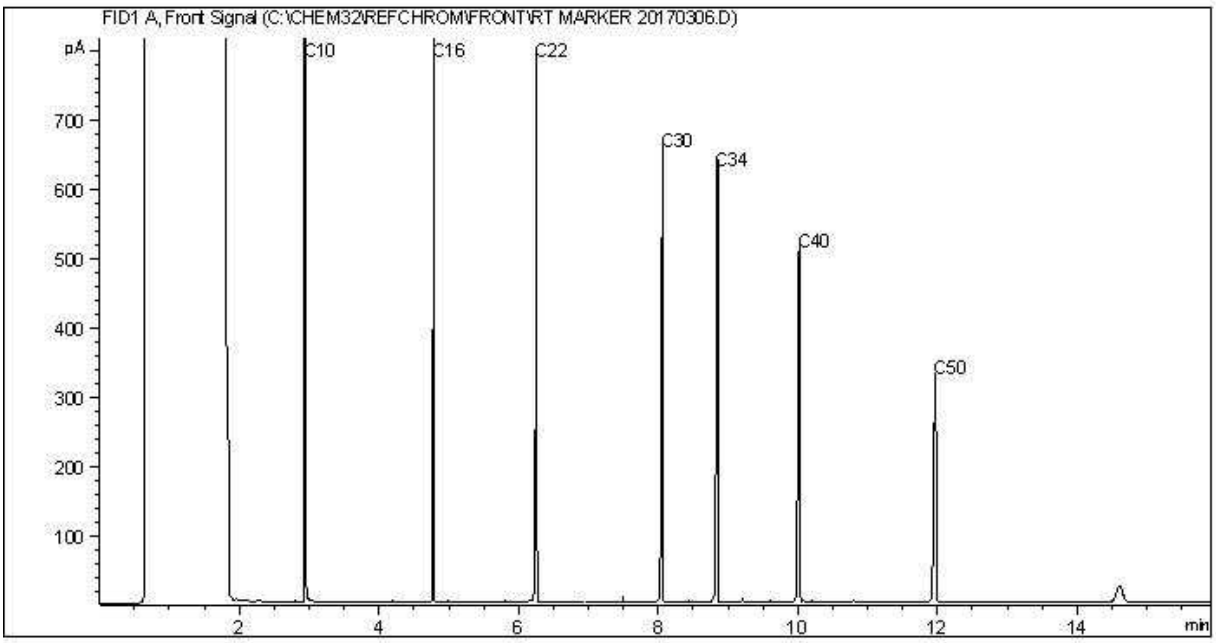
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: MW13-7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your P.O. #: 110220176
Your Project #: 110220176
Site Location: CBA APRON
Your C.O.C. #: M053901

Attention: LINDSAY VAN NOORTWYK

STANTEC CONSULTING LTD
10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/08/23
Report #: R2608172
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B869026
Received: 2018/08/15, 08:30

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract)	7	2018/08/17	2018/08/21	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2018/08/22	AB SOP-00039	Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (1)	7	2018/08/17	2018/08/19	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Moisture	7	N/A	2018/08/17	AB SOP-00002	CCME PHC-CWS m
Lead	7	2018/08/22	2018/08/22	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Your P.O. #: 110220176
Your Project #: 110220176
Site Location: CBA APRON
Your C.O.C. #: M053901

Attention: LINDSAY VAN NOORTWYK

STANTEC CONSULTING LTD
10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/08/23
Report #: R2608172
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B869026
Received: 2018/08/15, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Geraldlyn Gouthro, Client Service Specialist
Email: GGouthro@maxxam.ca
Phone# (403)735-2230
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B869026
Report Date: 2018/08/23

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		UC0313		UC0314		UC0314			
Sampling Date		2018/08/13 12:45		2018/08/13 12:55		2018/08/13 12:55			
COC Number		M053901		M053901		M053901			
	UNITS	APR-S01-0-0.3	MU	APR-S02-0-0.3	MU	APR-S02-0-0.3 Lab-Dup	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	180	+/- 60	<10	N/A	N/A	N/A	10	9106818
F3 (C16-C34 Hydrocarbons)	mg/kg	150	+/- 55	150	+/- 54	N/A	N/A	50	9106818
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	<50	N/A	N/A	N/A	50	9106818
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	N/A	N/A	N/A	9106818
Physical Properties									
Moisture	%	11	+/- 0.79	8.3	+/- 0.61	N/A	N/A	0.30	9106521
Volatiles									
Benzene	mg/kg	<0.0050	N/A	<0.0050	N/A	<0.0050	N/A	0.0050	9106729
Toluene	mg/kg	<0.020	N/A	<0.020	N/A	<0.020	N/A	0.020	9106729
Ethylbenzene	mg/kg	<0.010	N/A	<0.010	N/A	<0.010	N/A	0.010	9106729
m & p-Xylene	mg/kg	<0.040	N/A	<0.040	N/A	<0.040	N/A	0.040	9106729
o-Xylene	mg/kg	<0.020	N/A	<0.020	N/A	<0.020	N/A	0.020	9106729
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	N/A	N/A	N/A	0.045	9105815
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	N/A	N/A	N/A	10	9105815
F1 (C6-C10)	mg/kg	<10	N/A	<10	N/A	<10	N/A	10	9106729
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	N/A	100	N/A	98	N/A	N/A	9106729
4-Bromofluorobenzene (sur.)	%	101	N/A	98	N/A	101	N/A	N/A	9106729
D10-o-Xylene (sur.)	%	109	N/A	102	N/A	114	N/A	N/A	9106729
D4-1,2-Dichloroethane (sur.)	%	112	N/A	106	N/A	113	N/A	N/A	9106729
O-TERPHENYL (sur.)	%	87	N/A	90	N/A	N/A	N/A	N/A	9106818

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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Maxxam Job #: B869026
Report Date: 2018/08/23

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		UC0315		UC0316		UC0317			
Sampling Date		2018/08/13 13:01		2018/08/13 13:14		2018/08/13 17:44			
COC Number		M053901		M053901		M053901			
	UNITS	APR-S03-0-0.3	MU	APR-S04-0-0.3	MU	APR-S05-0-0.3	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	16	+/- 12	47	+/- 19	<10	N/A	10	9106818
F3 (C16-C34 Hydrocarbons)	mg/kg	1300	+/- 420	550	+/- 180	780	+/- 260	50	9106818
F4 (C34-C50 Hydrocarbons)	mg/kg	870	+/- 320	320	+/- 120	520	+/- 190	50	9106818
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	Yes	N/A	N/A	9106818
Physical Properties									
Moisture	%	12	+/- 0.86	12	+/- 0.84	12	+/- 0.91	0.30	9106521
Volatiles									
Benzene	mg/kg	<0.0050	N/A	<0.0050	N/A	<0.0050	N/A	0.0050	9106729
Toluene	mg/kg	<0.020	N/A	<0.020	N/A	<0.020	N/A	0.020	9106729
Ethylbenzene	mg/kg	<0.010	N/A	<0.010	N/A	<0.010	N/A	0.010	9106729
m & p-Xylene	mg/kg	<0.040	N/A	<0.040	N/A	<0.040	N/A	0.040	9106729
o-Xylene	mg/kg	<0.020	N/A	<0.020	N/A	<0.020	N/A	0.020	9106729
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	N/A	<0.045	N/A	0.045	9105815
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	N/A	<10	N/A	10	9105815
F1 (C6-C10)	mg/kg	<10	N/A	<10	N/A	<10	N/A	10	9106729
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	N/A	99	N/A	100	N/A	N/A	9106729
4-Bromofluorobenzene (sur.)	%	98	N/A	100	N/A	100	N/A	N/A	9106729
D10-o-Xylene (sur.)	%	104	N/A	109	N/A	100	N/A	N/A	9106729
D4-1,2-Dichloroethane (sur.)	%	106	N/A	109	N/A	107	N/A	N/A	9106729
O-TERPHENYL (sur.)	%	103	N/A	103	N/A	96	N/A	N/A	9106818

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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Maxxam Job #: B869026
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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		UC0318		UC0319			
Sampling Date		2018/08/13 17:57		2018/08/13			
COC Number		M053901		M053901			
	UNITS	APR-S06-0-0.3	MU	APR-S-QC-01	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	27	+/- 14	<10	N/A	10	9106818
F3 (C16-C34 Hydrocarbons)	mg/kg	83	+/- <RDL	1100	+/- 370	50	9106818
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	760	+/- 280	50	9106818
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	N/A	9106818
Physical Properties							
Moisture	%	7.8	+/- 0.58	12	+/- 0.87	0.30	9106521
Volatiles							
Benzene	mg/kg	<0.0050	N/A	<0.0050	N/A	0.0050	9106729
Toluene	mg/kg	<0.020	N/A	<0.020	N/A	0.020	9106729
Ethylbenzene	mg/kg	<0.010	N/A	<0.010	N/A	0.010	9106729
m & p-Xylene	mg/kg	<0.040	N/A	<0.040	N/A	0.040	9106729
o-Xylene	mg/kg	<0.020	N/A	<0.020	N/A	0.020	9106729
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	N/A	0.045	9105815
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	N/A	10	9105815
F1 (C6-C10)	mg/kg	<10	N/A	<10	N/A	10	9106729
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	101	N/A	99	N/A	N/A	9106729
4-Bromofluorobenzene (sur.)	%	99	N/A	98	N/A	N/A	9106729
D10-o-Xylene (sur.)	%	99	N/A	115	N/A	N/A	9106729
D4-1,2-Dichloroethane (sur.)	%	107	N/A	112	N/A	N/A	9106729
O-TERPHENYL (sur.)	%	94	N/A	89	N/A	N/A	9106818

RDL = Reportable Detection Limit
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N/A = Not Applicable

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Maxxam Job #: B869026
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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UC0313		UC0314		UC0315		UC0316			
Sampling Date		2018/08/13 12:45		2018/08/13 12:55		2018/08/13 13:01		2018/08/13 13:14			
COC Number		M053901		M053901		M053901		M053901			
	UNITS	APR-S01-0-0.3	MU	APR-S02-0-0.3	MU	APR-S03-0-0.3	MU	APR-S04-0-0.3	MU	RDL	QC Batch
Elements											
Total Lead (Pb)	mg/kg	8.5	+/- 1.6	8.1	+/- 1.5	6.6	+/- 1.2	12	+/- 2.3	0.50	9112190

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

Maxxam ID		UC0317		UC0318		UC0319			
Sampling Date		2018/08/13 17:44		2018/08/13 17:57		2018/08/13			
COC Number		M053901		M053901		M053901			
	UNITS	APR-S05-0-0.3	MU	APR-S06-0-0.3	MU	APR-S-QC-01	MU	RDL	QC Batch
Elements									
Total Lead (Pb)	mg/kg	5.7	+/- 1.1	6.7	+/- 1.2	6.6	+/- 1.2	0.50	9112190

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

Maxxam Job #: B869026
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STANTEC CONSULTING LTD
Client Project #: 110220176
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Sampler Initials: LA

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.0°C
Package 2	2.0°C

Sample UC0313 [APR-S01-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0314 [APR-S02-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0315 [APR-S03-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0316 [APR-S04-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0317 [APR-S05-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0318 [APR-S06-0-0.3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UC0319 [APR-S-QC-01] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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Maxxam Job #: B869026
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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9106521	NBA	Method Blank	Moisture	2018/08/17	<0.30		%	
9106521	NBA	RPD	Moisture	2018/08/17	1.8		%	20
9106729	DUO	Matrix Spike [UC0314-01]	1,4-Difluorobenzene (sur.)	2018/08/21		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/21		101	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/21		119	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/21		116	%	50 - 140
			Benzene	2018/08/21		118	%	50 - 140
			Toluene	2018/08/21		108	%	50 - 140
			Ethylbenzene	2018/08/21		109	%	50 - 140
			m & p-Xylene	2018/08/21		114	%	50 - 140
			o-Xylene	2018/08/21		112	%	50 - 140
			F1 (C6-C10)	2018/08/21		118	%	60 - 140
9106729	DUO	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/21		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/21		98	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/21		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/21		104	%	50 - 140
			Benzene	2018/08/21		102	%	60 - 130
			Toluene	2018/08/21		94	%	60 - 130
			Ethylbenzene	2018/08/21		94	%	60 - 130
			m & p-Xylene	2018/08/21		100	%	60 - 130
			o-Xylene	2018/08/21		96	%	60 - 130
			F1 (C6-C10)	2018/08/21		103	%	60 - 140
9106729	DUO	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/21		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/21		99	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/21		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/21		107	%	50 - 140
			Benzene	2018/08/21	<0.0050		mg/kg	
			Toluene	2018/08/21	<0.020		mg/kg	
			Ethylbenzene	2018/08/21	<0.010		mg/kg	
			m & p-Xylene	2018/08/21	<0.040		mg/kg	
			o-Xylene	2018/08/21	<0.020		mg/kg	
			F1 (C6-C10)	2018/08/21	<10		mg/kg	
9106729	DUO	RPD [UC0314-01]	Benzene	2018/08/21	NC		%	50
			Toluene	2018/08/21	NC		%	50
			Ethylbenzene	2018/08/21	NC		%	50
			m & p-Xylene	2018/08/21	NC		%	50
			o-Xylene	2018/08/21	NC		%	50
			F1 (C6-C10)	2018/08/21	NC		%	40
9106818	GG3	Matrix Spike	O-TERPHENYL (sur.)	2018/08/19		88	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/19		96	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/19		92	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/19		90	%	60 - 140
9106818	GG3	Spiked Blank	O-TERPHENYL (sur.)	2018/08/19		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/19		105	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/19		100	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/19		98	%	60 - 140
9106818	GG3	Method Blank	O-TERPHENYL (sur.)	2018/08/19		96	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/19	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/08/19	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/08/19	<50		mg/kg	
9106818	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2018/08/19	NC		%	40

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STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F3 (C16-C34 Hydrocarbons)	2018/08/19	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/08/19	NC		%	40
9112190	JHS	Matrix Spike	Total Lead (Pb)	2018/08/22		82	%	75 - 125
9112190	JHS	QC Standard	Total Lead (Pb)	2018/08/22		100	%	79 - 121
9112190	JHS	Spiked Blank	Total Lead (Pb)	2018/08/22		98	%	80 - 120
9112190	JHS	Method Blank	Total Lead (Pb)	2018/08/22	<0.50		mg/kg	
9112190	JHS	RPD	Total Lead (Pb)	2018/08/22	5.2		%	35

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

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

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

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

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

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

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

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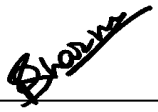
Report Date: 2018/08/23

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA APRON
Your P.O. #: 110220176
Sampler Initials: LA

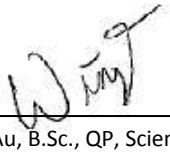
VALIDATION SIGNATURE PAGE

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

Justin Geisel, B.Sc., Organics Supervisor



Poonam Sharma, cCT, Organics Supervisor



Winnie Au, B.Sc., QP, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY #	
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COOLER OBSERVATIONS:

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	2 (1)	2 (2)	4 (3)
INTACT	✓					
ICE PRESENT	✓					
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	5 (1)	3 (2)	2 (3)
INTACT	✓					
ICE PRESENT	✓					
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	7 (1)	3 (2)	3 (3)
INTACT	✓					
ICE PRESENT	✓					
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	2 (1)	2 (2)	2 (3)
INTACT	✓					
ICE PRESENT	✓					
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						

MAXXAM JOB#: B8691026

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						
CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP	1	2	3
INTACT						
ICE PRESENT						

RECEIVED BY (SIGN & PRINT)		DATE (YYYY/MM/DD)	TIME (HH:MM)
Gina Antonucci	Gina Antonucci	20180816	1028

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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

847 (4)

CHAIN OF CUSTODY RECORD

M 053901

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Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: ~~Lindsay Van Noortwyk Stantec~~	Company:	Quotation #:	[X] 5 - 7 Days Regular (Most analyses)
Contact Name: Lindsay Van Noortwyk	Contact Name:	P.O. #/ AFE#: 110220176	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 10160 112 St NW	Address:		Rush TAT (Surcharges will be applied)
Edmonton AB T5K2L6		Project #: 110220176	[ ] Same Day [ ] 2 Days
Phone: 780 2321114	Phone:	Site Location: CBA Apron	[ ] 1 Day [ ] 3-4 Days
Email: Lindsay.VanNoortwyk@stantec.com	Email:	Site #:	Date Required:
Copies:	Copies:	Sampled By: LA	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	see	ACTR	
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

RECEIVED IN YELLOWKNIFE
Depot Reception
By: Jeffery.S
Ice-yes 2018 -08- 15 0830
Sealed-yes
Temp: 2 3 4
2 3 1

Analysis Requested

	Sample Identification	Depth (Unit) (cm)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☐ Tot ☐ Diss	Mercury ☐ Total ☐ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Lead	HOLD - DO NOT ANALYZE
1	APR-S01-0-0.3	0-0.3	2018/08/13	1245	S	3			X								X	
2	APR-S02-0-0.3			1255					X								X	
3	APR-S03-0-0.3			1301					X								X	
4	APR-S04-0-0.3			1314					X								X	
5	APR-S05-0-0.3			1744					X								X	
6	APR-S06-0-0.3	0-0.3	2018/08/13	1757					X								X	
7	APR-S-QC-01	—	2018/08/13	—	S	3			X								X	
8																		
9																		
10																		

Please indicate Filtered, Preserved or Both (F, P, F/P)

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water
- [ ] D50 (Drilling Waste)
- [ ] Saskatchewan
- [ ] Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Luke Andersen	2018/08/14	0845 LA	Gina Antonucci	20180816	1028	B8690260

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

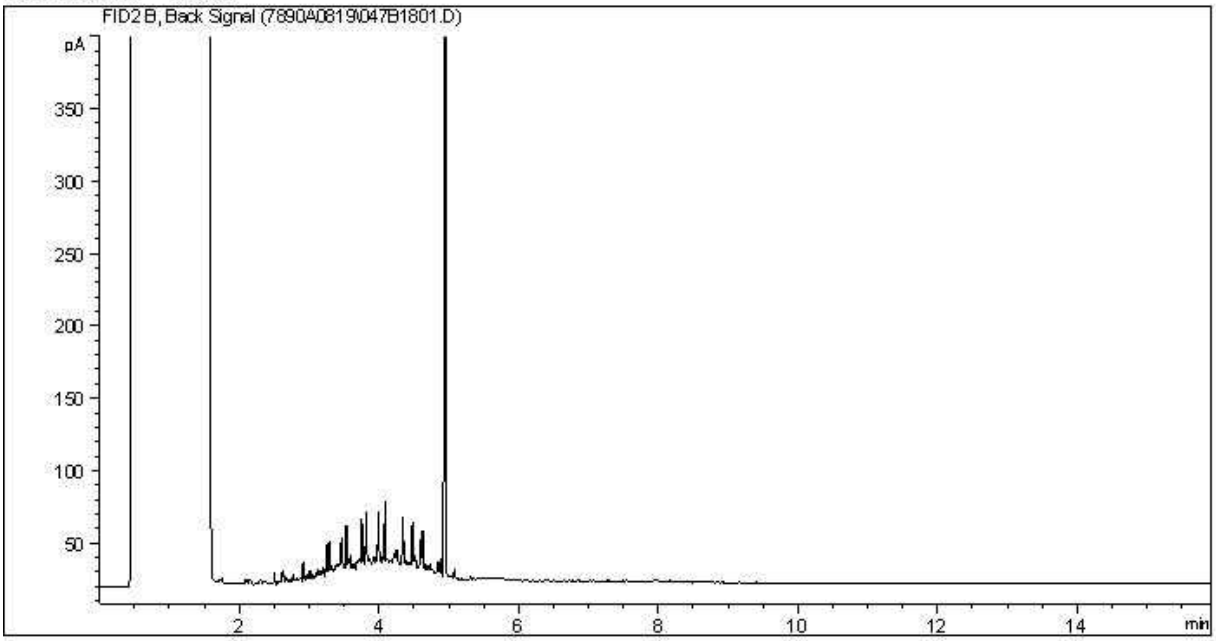
AB FCD-00331/7

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0313

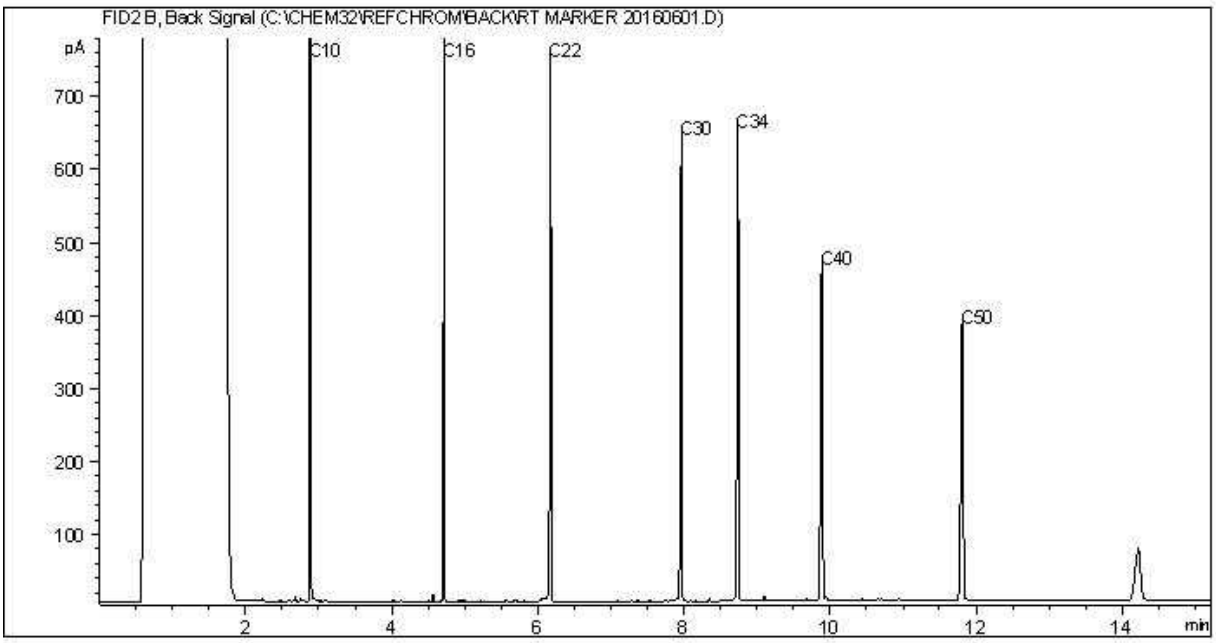
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S01-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

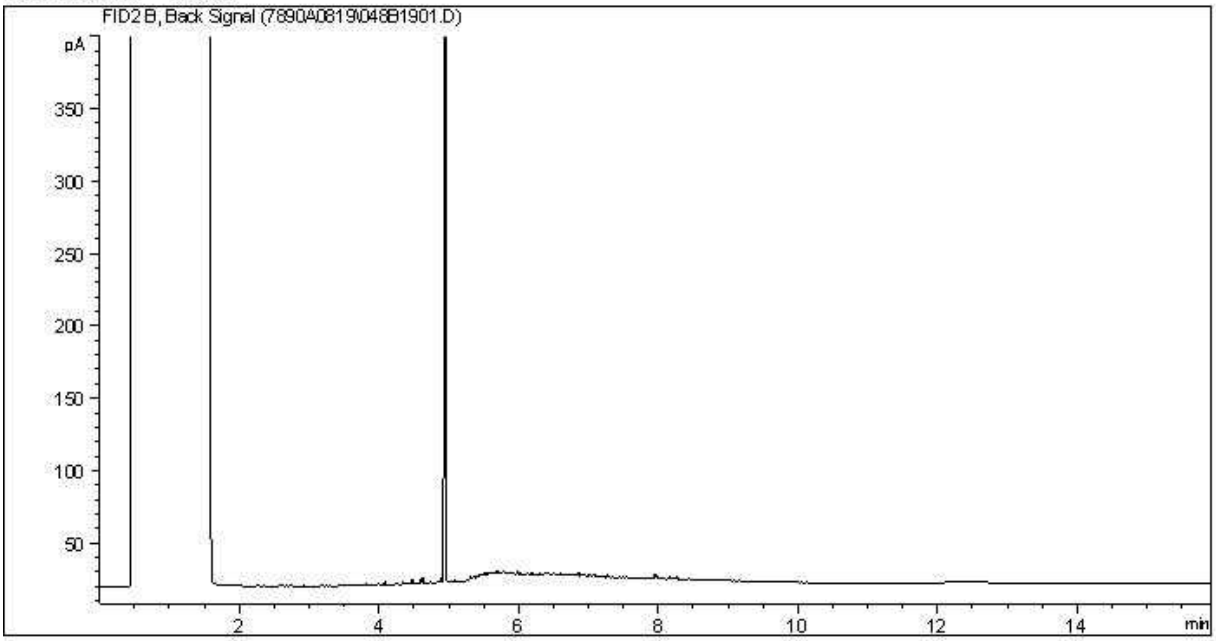
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0314

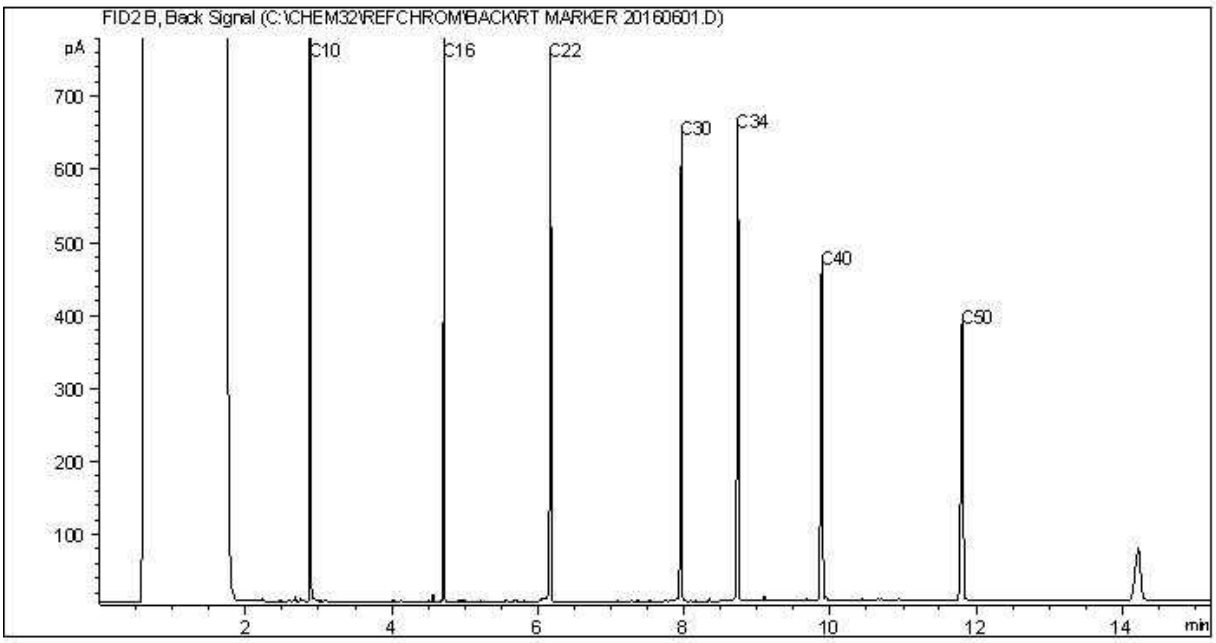
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S02-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

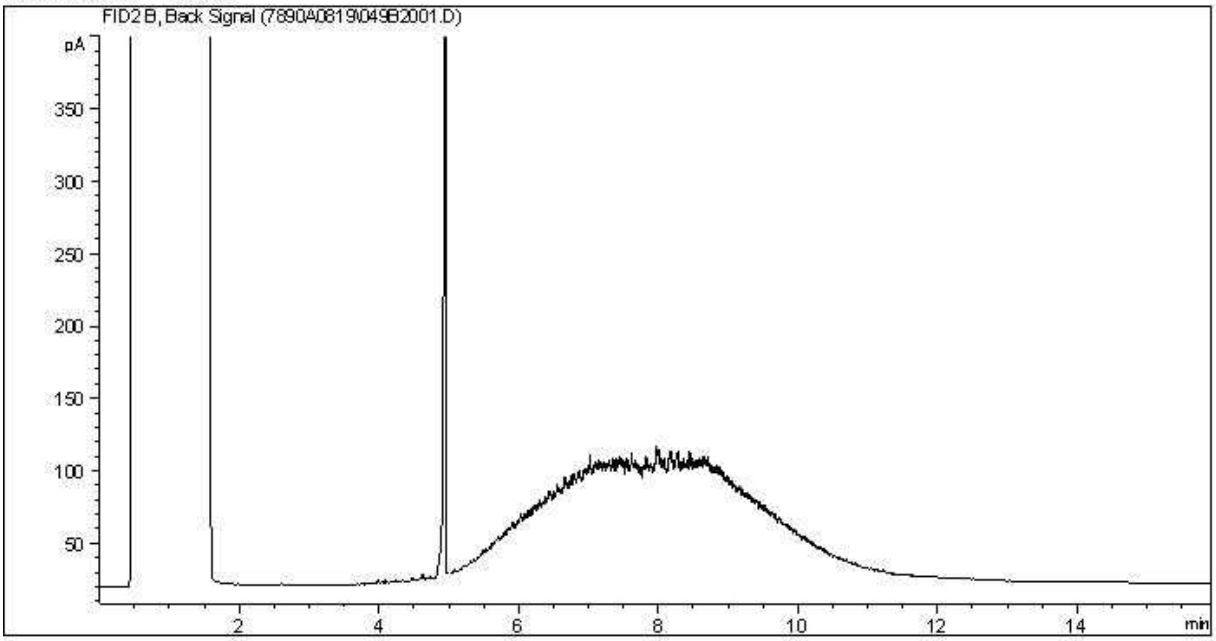
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0315

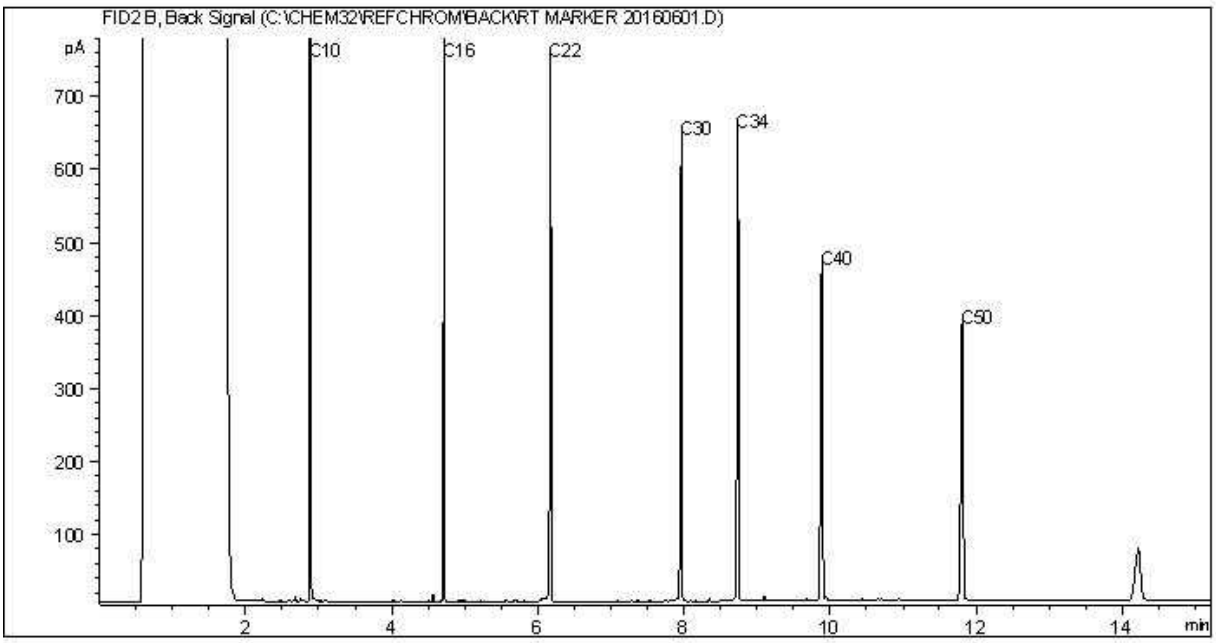
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S03-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

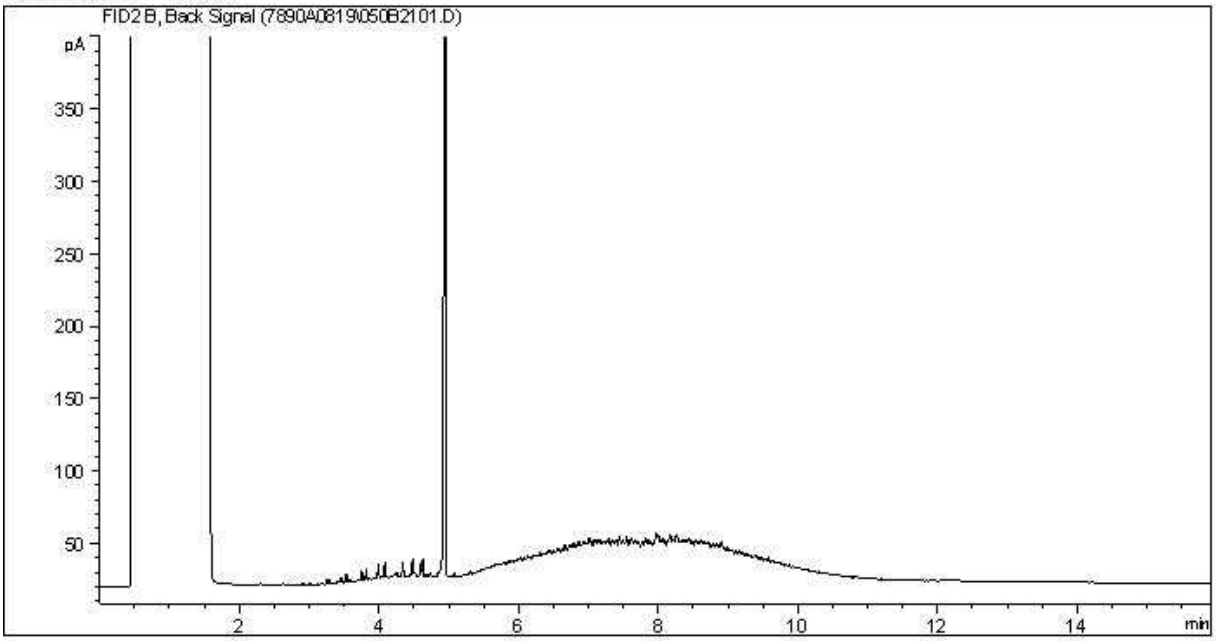
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0316

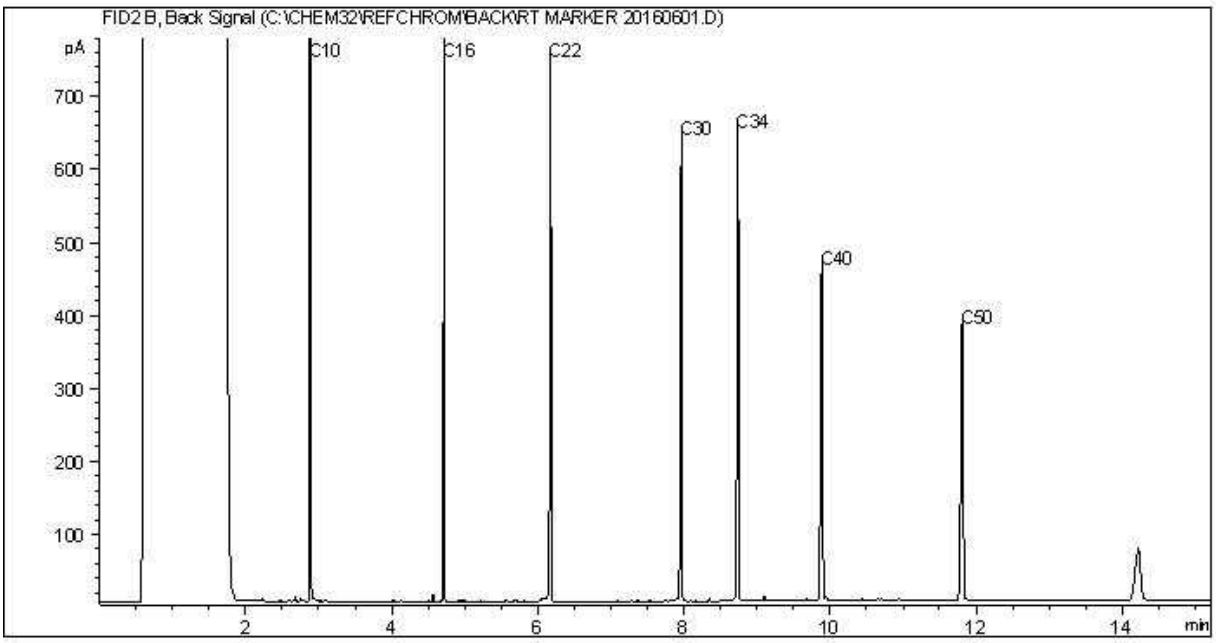
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S04-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

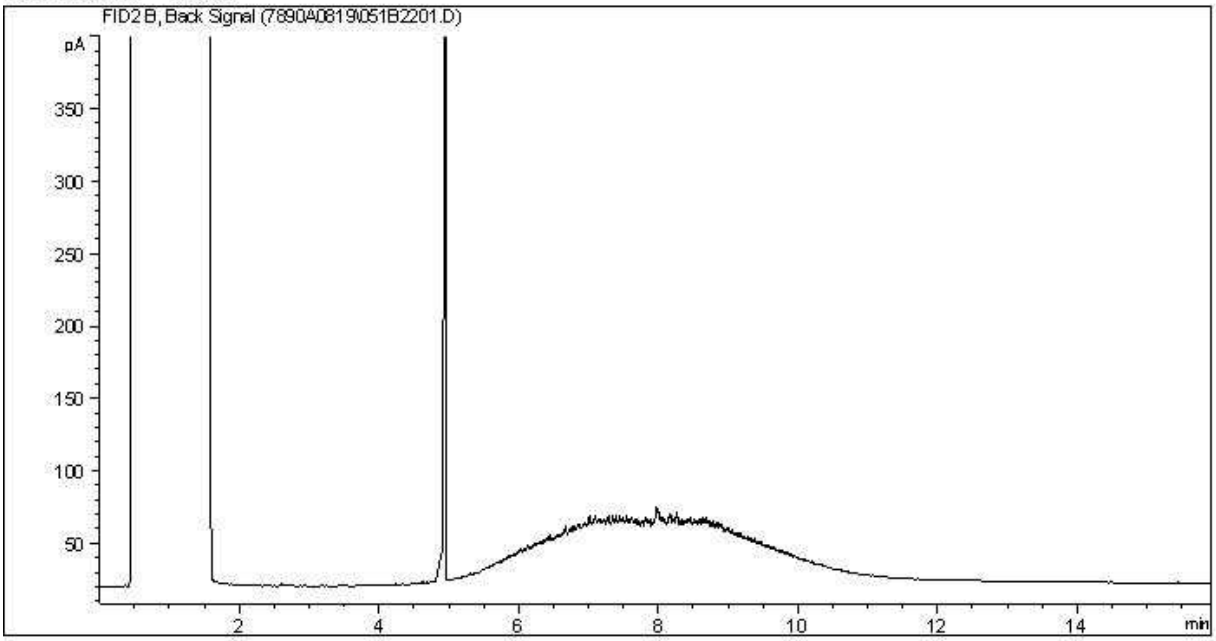
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0317

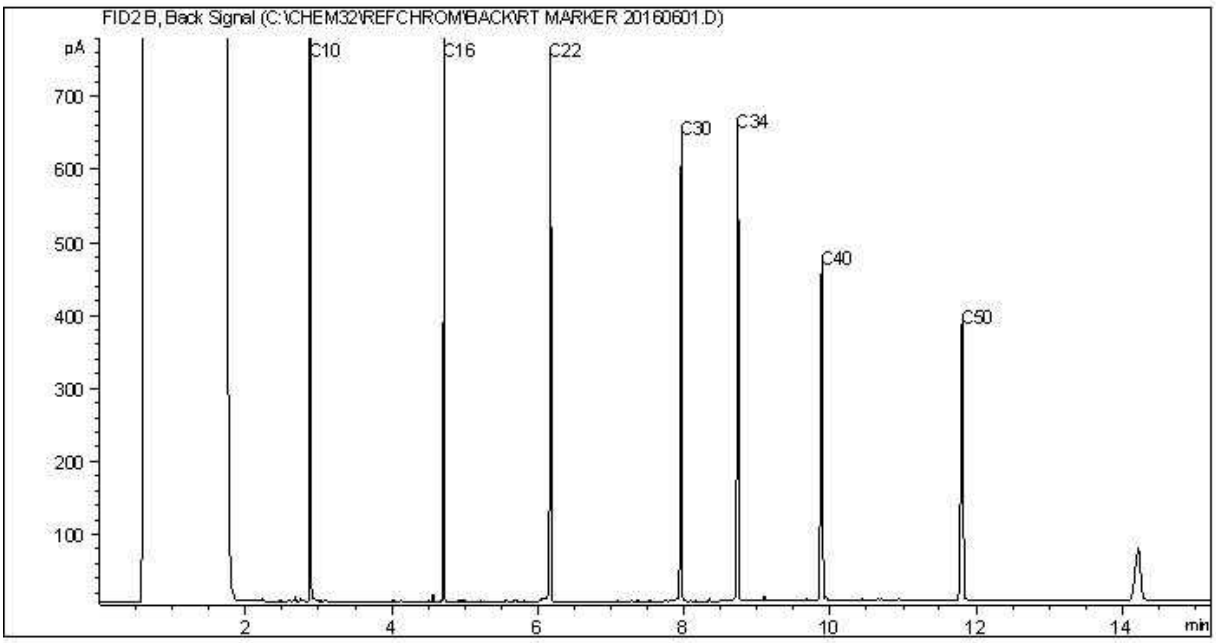
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S05-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

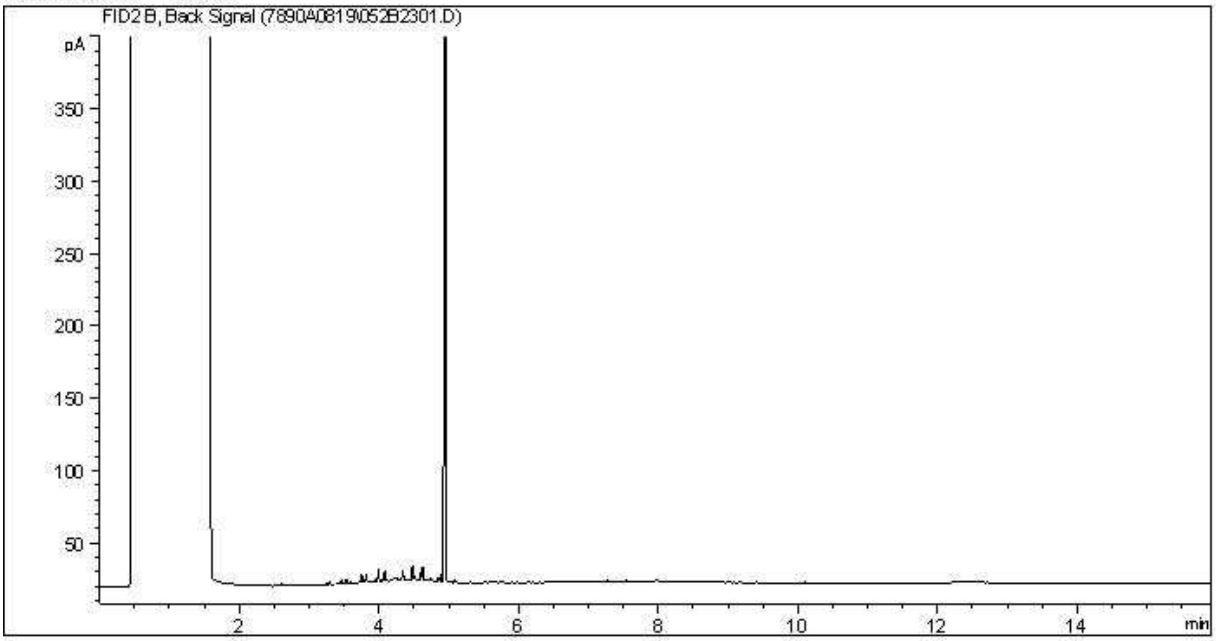
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0318

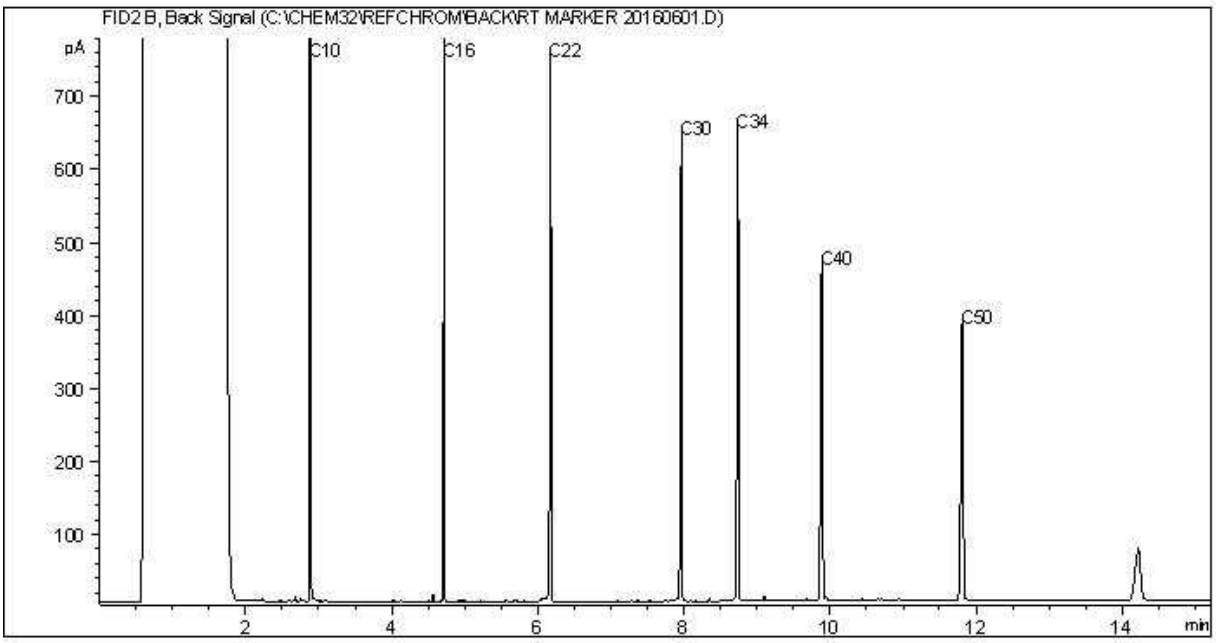
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S06-0-0.3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

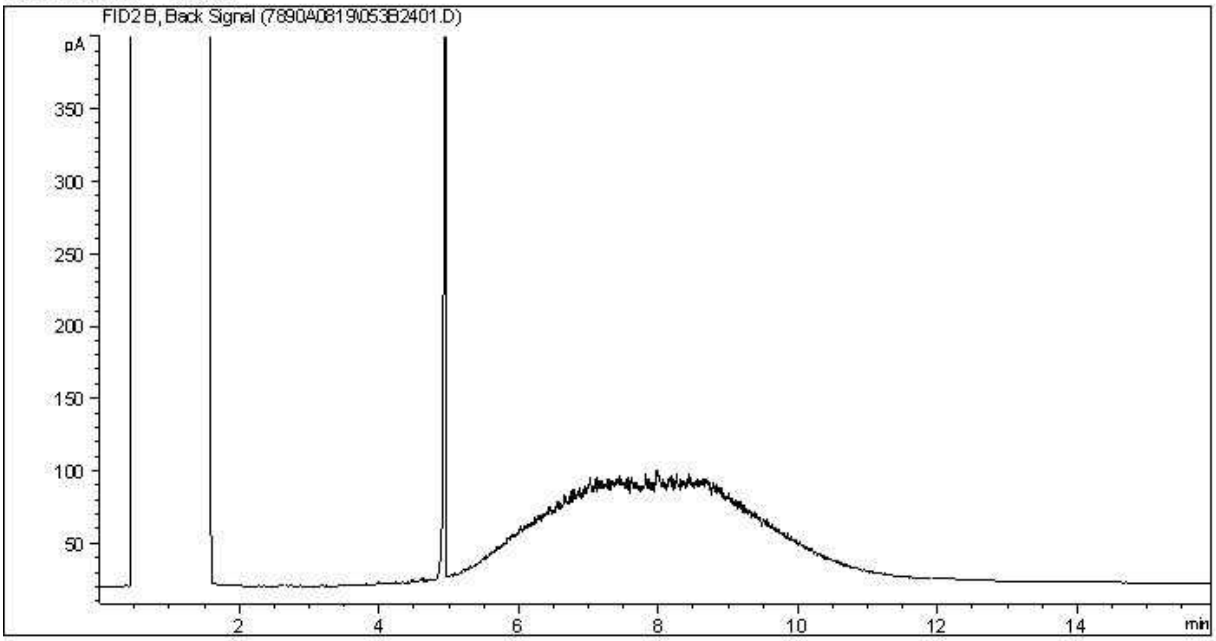
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B869026
Report Date: 2018/08/23
Maxxam Sample: UC0319

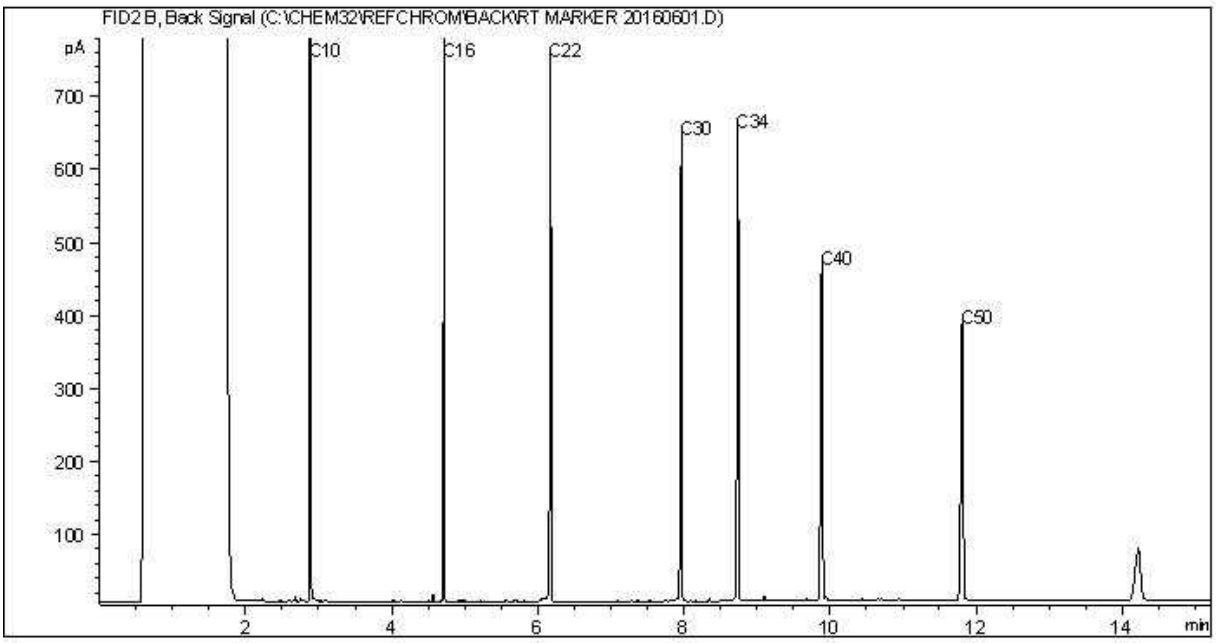
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA APRON
Client ID: APR-S-QC-01

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam
A Bureau Veritas Group Company

Your Project #: 110220176
Site#: B867483
Site Location: CBA
Your C.O.C. #: n/a

Attention: Stantec Reporting

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
CANADA T6B 2R4

Report Date: 2018/08/29
Report #: R5378937
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8K6848
Received: 2018/08/14, 10:29

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Low level PFOS and PFOA by SPE/LCMS (1)	2	2018/08/22	2018/08/24	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Your Project #: 110220176
Site#: B867483
Site Location: CBA
Your C.O.C. #: n/a

Attention: Stantec Reporting

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
CANADA T6B 2R4

Report Date: 2018/08/29
Report #: R5378937
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8K6848
Received: 2018/08/14, 10:29

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Augustyna Dobosz, Project Manager
Email: ADobosz@maxxam.ca
Phone# (905)817-5700 Ext:5798

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8K6848
Report Date: 2018/08/29

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

RESULTS OF ANALYSES OF WATER

Maxxam ID		HLU517	HLU518		
Sampling Date		2018/08/09 16:30	2018/08/09 16:40		
COC Number		n/a	n/a		
	UNITS	UB2829-TRIP BLANK-02	UB2830-FIELD BLANK-02	RDL	QC Batch
Miscellaneous Parameters					
Perfluorobutane Sulfonate (PFBS)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorobutanoic acid	ng/L	<2.0	<2.0	2.0	5692616
Perfluorodecane Sulfonate	ng/L	<2.0	<2.0	2.0	5692616
Perfluorodecanoic Acid (PFDA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorododecanoic Acid (PFDoA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluoroheptane sulfonate	ng/L	<2.0	<2.0	2.0	5692616
Perfluoroheptanoic Acid (PFHpA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorohexane Sulfonate (PFHxS)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorohexanoic Acid (PFHxA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorononanoic Acid (PFNA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorooctane Sulfonamide (PFOSA)	ng/L	<4.0 (1)	<4.0 (1)	4.0	5702169
Perfluorooctane Sulfonate (PFOS)	ng/L	<2.0	<2.0	2.0	5692616
Perfluoropentanoic Acid (PFPeA)	ng/L	<2.0	<2.0	2.0	5692616
Perfluorotetradecanoic Acid	ng/L	<2.0	<2.0	2.0	5692616
Perfluorotridecanoic Acid	ng/L	<2.0	<2.0	2.0	5692616
Perfluoroundecanoic Acid (PFUnA)	ng/L	<2.0	<2.0	2.0	5692616
Surrogate Recovery (%)					
13C2-Perfluorodecanoic acid	%	88	85	N/A	5692616
13C2-Perfluorododecanoic acid	%	78	73	N/A	5692616
13C2-Perfluorohexanoic acid	%	94	90	N/A	5692616
13C2-perfluorotetradecanoic acid	%	71	66	N/A	5692616
13C2-Perfluoroundecanoic acid	%	83	75	N/A	5692616
13C4-Perfluorobutanoic acid	%	94	88	N/A	5692616
13C4-Perfluoroheptanoic acid	%	98	94	N/A	5692616
13C4-Perfluorooctanesulfonate	%	112	111	N/A	5692616
13C4-Perfluorooctanoic acid	%	101	95	N/A	5692616
13C5-Perfluorononanoic acid	%	101	95	N/A	5692616
13C5-Perfluoropentanoic acid	%	95	93	N/A	5692616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Analysis was performed past the method defined holding time. Because of their chemical structure, PFCs are chemically and biologically stable in the environment and resist typical environmental degradation processes. This would suggest a hold time exceedance would not have a significant impact on the data.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8K6848
Report Date: 2018/08/29

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

RESULTS OF ANALYSES OF WATER

Maxxam ID		HLU517	HLU518		
Sampling Date		2018/08/09 16:30	2018/08/09 16:40		
COC Number		n/a	n/a		
	UNITS	**UB2829-TRIP BLANK-02**	**UB2830-FIELD BLANK-02**	**RDL**	**QC Batch**
13C8-Perfluorooctane Sulfonamide	%	26	21	N/A	5702169
18O2-Perfluorohexanesulfonate	%	97	93	N/A	5692616

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8K6848
Report Date: 2018/08/29

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.0°C

Sample HLU517, Low level PFOS and PFOA by SPE/LCMS: Test repeated.
Sample HLU518, Low level PFOS and PFOA by SPE/LCMS: Test repeated.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8K6848
Report Date: 2018/08/29

QUALITY ASSURANCE REPORT

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5692616	13C2-Perfluorodecanoic acid	2018/08/23	91	50 - 150	91	%		
5692616	13C2-Perfluorododecanoic acid	2018/08/23	82	50 - 150	80	%		
5692616	13C2-Perfluorohexanoic acid	2018/08/23	86	50 - 150	90	%		
5692616	13C2-perfluorotetradecanoic acid	2018/08/23	75	50 - 150	74	%		
5692616	13C2-Perfluoroundecanoic acid	2018/08/23	85	50 - 150	81	%		
5692616	13C4-Perfluorobutanoic acid	2018/08/23	87	50 - 150	88	%		
5692616	13C4-Perfluoroheptanoic acid	2018/08/23	86	50 - 150	91	%		
5692616	13C4-Perfluorooctanesulfonate	2018/08/23	93	50 - 150	83	%		
5692616	13C4-Perfluorooctanoic acid	2018/08/23	91	50 - 150	89	%		
5692616	13C5-Perfluorononanoic acid	2018/08/23	88	50 - 150	94	%		
5692616	13C5-Perfluoropentanoic acid	2018/08/23	86	50 - 150	92	%		
5692616	18O2-Perfluorohexanesulfonate	2018/08/23	87	50 - 150	84	%		
5702169	13C8-Perfluorooctane Sulfonamide	2018/08/29	21	20 - 100	19 (1)			
5692616	Perfluorobutane Sulfonate (PFBS)	2018/08/23	110	70 - 130	<2.0	ng/L	0.93	30
5692616	Perfluorobutanoic acid	2018/08/23	98	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorodecane Sulfonate	2018/08/23	94	70 - 130	<2.0	ng/L	0.75	30
5692616	Perfluorodecanoic Acid (PFDA)	2018/08/23	94	70 - 130	<2.0	ng/L	2.5	30
5692616	Perfluorododecanoic Acid (PFDoA)	2018/08/23	98	70 - 130	<2.0	ng/L	1.6	30
5692616	Perfluoroheptane sulfonate	2018/08/23	99	70 - 130	<2.0	ng/L	1.1	30
5692616	Perfluoroheptanoic Acid (PFHpA)	2018/08/23	99	70 - 130	<2.0	ng/L	3.0	30
5692616	Perfluorohexane Sulfonate (PFHxS)	2018/08/23	100	70 - 130	<2.0	ng/L	2.2	30
5692616	Perfluorohexanoic Acid (PFHxA)	2018/08/23	104	70 - 130	<2.0	ng/L	0.86	30
5692616	Perfluoro-n-Octanoic Acid (PFOA)	2018/08/23	100	70 - 130	<2.0	ng/L	5.3	30
5692616	Perfluorononanoic Acid (PFNA)	2018/08/23	99	70 - 130	<2.0	ng/L	7.1	30
5692616	Perfluorooctane Sulfonate (PFOS)	2018/08/23	98	70 - 130	<2.0	ng/L	5.2	30
5692616	Perfluoropentanoic Acid (PFPeA)	2018/08/23	100	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorotetradecanoic Acid	2018/08/23	102	70 - 130	<2.0	ng/L	1.3	30
5692616	Perfluorotridecanoic Acid	2018/08/23	109	70 - 130	<2.0	ng/L	0.74	30
5692616	Perfluoroundecanoic Acid (PFUnA)	2018/08/23	110	70 - 130	<2.0	ng/L	2.2	30

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Maxxam Job #: B8K6848
Report Date: 2018/08/29

QUALITY ASSURANCE REPORT(CONT'D)

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5702169	Perfluorooctane Sulfonamide (PFOSA)	2018/08/29	104	70 - 130	<4.0	ng/L	7.0	30

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

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

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

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

(1) Extracted internal standard analyte recovery was below the defined lower control limit (LCL). Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low extracted internal standard analyte recovery.

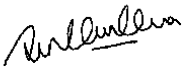
Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8K6848
Report Date: 2018/08/29

Maxxam Analytics
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

VALIDATION SIGNATURE PAGE

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



Sin Chii Chia, Scientific Services

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Your Project #: 110220176
Site Location: CBA
Your C.O.C. #: M086442

Attention: LINDSAY VAN NOORTWYK

STANTEC CONSULTING LTD
10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/09/05
Report #: R2614422
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B867483
Received: 2018/08/12, 10:00

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2018/08/14	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/08/13	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2018/08/14	AB SOP-00039	Auto Calc
Chloride by Automated Colourimetry	1	N/A	2018/08/15	AB SOP-00020	SM 22 4500-Cl-E m
Conductivity @25C	1	N/A	2018/08/14	AB SOP-00005	SM 23 2510 B m
Perfluorinated Compounds (Water) (1)	1	N/A	2018/09/05		
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2018/08/14	2018/08/15	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2018/08/14	AB WI-00065	Auto Calc
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2018/08/13	AB SOP-00042	EPA 6010d R4 m
Elements by ICP - Total	1	2018/08/17	2018/08/17	AB SOP-00014 / AB SOP-00042	EPA 6010d R4 m
Elements by ICPMS - Total	1	2018/08/17	2018/08/17	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2018/08/14	AB WI-00065	Auto Calc
Sum of cations, anions	1	N/A	2018/08/14	AB WI-00065	Auto Calc
Ammonia-N (Total)	1	N/A	2018/08/14	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite	1	N/A	2018/08/14	AB WI-00065	Auto Calc
Nitrate (as N)	1	2018/08/13	2018/08/14	AB WI-00065	Auto Calc
NO2 - NO2 + NO3 (N) by CFA	1	N/A	2018/08/14	AB SOP-00082	IM 857-871m
Oil and Grease (Gravimetric, n-Hexane)	1	2018/08/14	2018/08/14	EENVSOP-00093	SM 23 5520B m
Benzo[a]pyrene Equivalency (4)	1	N/A	2018/08/15	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	1	2018/08/14	2018/08/14	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
pH @25°C (5)	1	N/A	2018/08/14	AB SOP-00005	SM 23 4500 H+ B m
Phenols (4-AAP)	1	N/A	2018/08/17	EENVSOP-00061	MMCW 154 1996 m
Sulphate by Automated Colourimetry	1	N/A	2018/08/15	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	1	N/A	2018/08/15	AB WI-00065	Auto Calc
Total Suspended Solids (NFR)	1	2018/08/13	2018/08/14	AB SOP-00061	SM 23 2540 D m

Remarks:

Your Project #: 110220176
Site Location: CBA
Your C.O.C. #: M086442

Attention: LINDSAY VAN NOORTWYK

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10160-112 STREET
EDMONTON, AB
CANADA T5K 2L6

Report Date: 2018/09/05
Report #: R2614422
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B867483
Received: 2018/08/12, 10:00

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Ontario (From Edmonton)
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Geraldlyn Gouthro, Client Service Specialist
Email: GGouthro@maxxam.ca
Phone# (403)735-2230

==========

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UB2829			
Sampling Date		2018/08/09 16:30			
COC Number		M086442			
	UNITS	TRIP BLANK-02	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	0.10	9101176
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	9100683
Toluene	mg/L	<0.00040	N/A	0.00040	9100683
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	9100683
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	9100683
o-Xylene	mg/L	<0.00040	N/A	0.00040	9100683
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	9100051
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	9100051
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	9100683
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	102	N/A	N/A	9100683
4-Bromofluorobenzene (sur.)	%	102	N/A	N/A	9100683
D4-1,2-Dichloroethane (sur.)	%	122	N/A	N/A	9100683
O-TERPHENYL (sur.)	%	112	N/A	N/A	9101176

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		UB2829		UB2829			
Sampling Date		2018/08/09 16:30		2018/08/09 16:30			
COC Number		M086442		M086442			
	UNITS	TRIP BLANK-02	MU	TRIP BLANK-02 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	0.0000	N/A	N/A	N/A	N/A	9100060
Cation Sum	meq/L	0.010	N/A	N/A	N/A	N/A	9100060
Hardness (CaCO3)	mg/L	<0.50	N/A	N/A	N/A	0.50	9100057
Ion Balance (% Difference)	%	NC	N/A	N/A	N/A	N/A	9100059
Dissolved Nitrate (N)	mg/L	<0.020	N/A	N/A	N/A	0.020	9100065
Dissolved Nitrate (NO3)	mg/L	<0.089	N/A	N/A	N/A	0.089	9100064
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	9100064
Calculated Total Dissolved Solids	mg/L	<0.022	N/A	N/A	N/A	0.022	9100067
Misc. Inorganics							
Conductivity	uS/cm	<2.0	N/A	N/A	N/A	2.0	9101278
pH	pH	4.99	+/- 0.0723	N/A	N/A	N/A	9101274
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	9101277
Alkalinity (Total as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	9101277
Bicarbonate (HCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	9101277
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	9101277
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	9101277
Dissolved Sulphate (SO4)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9102235
Dissolved Chloride (Cl)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9102232
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	9101659
Dissolved Nitrate plus Nitrite (N)	mg/L	<0.020	N/A	N/A	N/A	0.020	9101659
Lab Filtered Elements							
Dissolved Calcium (Ca)	mg/L	<0.30	N/A	N/A	N/A	0.30	9100448
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	9100448
Dissolved Magnesium (Mg)	mg/L	<0.20	N/A	N/A	N/A	0.20	9100448
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	N/A	N/A	0.0040	9100448

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		UB2829		UB2829			
Sampling Date		2018/08/09 16:30		2018/08/09 16:30			
COC Number		M086442		M086442			
	UNITS	**TRIP BLANK-02**	**MU**	**TRIP BLANK-02 Lab-Dup**	**MU**	**RDL**	**QC Batch**
Dissolved Potassium (K)	mg/L	<0.30	N/A	N/A	N/A	0.30	9100448
Dissolved Sodium (Na)	mg/L	<0.50	N/A	N/A	N/A	0.50	9100448

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Lab-Dup = Laboratory Initiated Duplicate
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N/A = Not Applicable

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2829			
Sampling Date		2018/08/09 16:30			
COC Number		M086442			
	UNITS	TRIP BLANK-02	MU	RDL	QC Batch
Elements					
Total Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9106453
Total Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9106453
Total Arsenic (As)	mg/L	<0.00020	N/A	0.00020	9106453
Total Barium (Ba)	mg/L	<0.010	N/A	0.010	9106454
Total Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9106453
Total Boron (B)	mg/L	<0.020	N/A	0.020	9106454
Total Cadmium (Cd)	mg/L	<0.000020	N/A	0.000020	9106453
Total Calcium (Ca)	mg/L	<0.30	N/A	0.30	9106454
Total Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9106453
Total Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	9106453
Total Copper (Cu)	mg/L	<0.00020	N/A	0.00020	9106453
Total Iron (Fe)	mg/L	<0.060	N/A	0.060	9106454
Total Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9106453
Total Lithium (Li)	mg/L	<0.020	N/A	0.020	9106454
Total Magnesium (Mg)	mg/L	<0.20	N/A	0.20	9106454
Total Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	9106454
Total Molybdenum (Mo)	mg/L	<0.00020	N/A	0.00020	9106453
Total Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	9106453
Total Phosphorus (P)	mg/L	<0.10	N/A	0.10	9106454
Total Potassium (K)	mg/L	<0.30	N/A	0.30	9106454
Total Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9106453
Total Silicon (Si)	mg/L	<0.10	N/A	0.10	9106454
Total Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9106453
Total Sodium (Na)	mg/L	<0.50	N/A	0.50	9106454
Total Strontium (Sr)	mg/L	<0.020	N/A	0.020	9106454
Total Sulphur (S)	mg/L	<0.20	N/A	0.20	9106454
Total Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9106453
Total Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9106453
Total Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9106453
Total Uranium (U)	mg/L	<0.00010	N/A	0.00010	9106453

RDL = Reportable Detection Limit
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N/A = Not Applicable

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		UB2829			
Sampling Date		2018/08/09 16:30			
COC Number		M086442			
	UNITS	TRIP BLANK-02	MU	RDL	QC Batch
Total Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9106453
Total Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9106453

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		UB2829			UB2830		
Sampling Date		2018/08/09 16:30			2018/08/09 16:40		
COC Number		M086442			M086442		
	UNITS	TRIP BLANK-02	MU	RDL	FIELD BLANK-02	MU	QC Batch
Parameter							
Subcontract Parameter	ug/L	N/A	N/A	N/A	ATTACHED	N/A	9130737
Misc. Inorganics							
Total Suspended Solids	mg/L	<1.0	N/A	1.0	N/A	N/A	9100680
Nutrients							
Total Ammonia (N)	mg/L	<0.015	N/A	0.015	N/A	N/A	9101643
Misc. Organics							
Extractable (n-Hex.) Oil and grease	mg/L	<2.0	N/A	2.0	N/A	N/A	9101842
Phenols	mg/L	<0.0020	N/A	0.0020	N/A	N/A	9106764

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Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UB2829			
Sampling Date		2018/08/09 16:30			
COC Number		M086442			
	UNITS	TRIP BLANK-02	MU	RDL	QC Batch
Polycyclic Aromatics					
Benzo[a]pyrene equivalency	mg/L	<0.000010	N/A	0.000010	9099738
Acenaphthene	mg/L	<0.00010	N/A	0.00010	9101169
Acenaphthylene	mg/L	<0.00010	N/A	0.00010	9101169
Acridine	mg/L	<0.000050	N/A	0.000050	9101169
Anthracene	mg/L	<0.000010	N/A	0.000010	9101169
Benzo(a)anthracene	mg/L	<0.0000085	N/A	0.0000085	9101169
Benzo(b&j)fluoranthene	mg/L	<0.0000085	N/A	0.0000085	9101169
Benzo(k)fluoranthene	mg/L	<0.0000085	N/A	0.0000085	9101169
Benzo(g,h,i)perylene	mg/L	<0.0000085	N/A	0.0000085	9101169
Benzo(c)phenanthrene	mg/L	<0.000050	N/A	0.000050	9101169
Benzo(a)pyrene	mg/L	<0.0000075	N/A	0.0000075	9101169
Benzo[e]pyrene	mg/L	<0.000050	N/A	0.000050	9101169
Chrysene	mg/L	<0.0000085	N/A	0.0000085	9101169
Dibenz(a,h)anthracene	mg/L	<0.0000075	N/A	0.0000075	9101169
Fluoranthene	mg/L	<0.000010	N/A	0.000010	9101169
Fluorene	mg/L	<0.000050	N/A	0.000050	9101169
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	N/A	0.0000085	9101169
1-Methylnaphthalene	mg/L	<0.00010	N/A	0.00010	9101169
2-Methylnaphthalene	mg/L	<0.00010	N/A	0.00010	9101169
Naphthalene	mg/L	<0.00010	N/A	0.00010	9101169
Phenanthrene	mg/L	<0.000050	N/A	0.000050	9101169
Perylene	mg/L	<0.000050	N/A	0.000050	9101169
Pyrene	mg/L	<0.000020	N/A	0.000020	9101169
Quinoline	mg/L	<0.00020	N/A	0.00020	9101169
Surrogate Recovery (%)					
D10-ANTHRACENE (sur.)	%	115	N/A	N/A	9101169
D8-ACENAPHTHYLENE (sur.)	%	103	N/A	N/A	9101169
D8-NAPHTHALENE (sur.)	%	74	N/A	N/A	9101169
TERPHENYL-D14 (sur.)	%	119	N/A	N/A	9101169

RDL = Reportable Detection Limit
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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.0°C

Sample UB2829 [TRIP BLANK-02] : Please see attachment for Perfluorinated Compounds (Water) results.

Sample UB2830 [FIELD BLANK-02] : Please see attachment for Perfluorinated Compounds (Water) results.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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STANTEC CONSULTING LTD
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Site Location: CBA
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9100448	JK9	Matrix Spike	Dissolved Calcium (Ca)	2018/08/13		97	%	80 - 120
			Dissolved Iron (Fe)	2018/08/13		98	%	80 - 120
			Dissolved Magnesium (Mg)	2018/08/13		104	%	80 - 120
			Dissolved Manganese (Mn)	2018/08/13		97	%	80 - 120
			Dissolved Potassium (K)	2018/08/13		103	%	80 - 120
			Dissolved Sodium (Na)	2018/08/13		99	%	80 - 120
9100448	JK9	Spiked Blank	Dissolved Calcium (Ca)	2018/08/13		97	%	80 - 120
			Dissolved Iron (Fe)	2018/08/13		97	%	80 - 120
			Dissolved Magnesium (Mg)	2018/08/13		102	%	80 - 120
			Dissolved Manganese (Mn)	2018/08/13		96	%	80 - 120
			Dissolved Potassium (K)	2018/08/13		101	%	80 - 120
			Dissolved Sodium (Na)	2018/08/13		100	%	80 - 120
9100448	JK9	Method Blank	Dissolved Calcium (Ca)	2018/08/13	<0.30		mg/L	
			Dissolved Iron (Fe)	2018/08/13	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2018/08/13	<0.20		mg/L	
			Dissolved Manganese (Mn)	2018/08/13	<0.0040		mg/L	
			Dissolved Potassium (K)	2018/08/13	<0.30		mg/L	
			Dissolved Sodium (Na)	2018/08/13	<0.50		mg/L	
9100448	JK9	RPD	Dissolved Calcium (Ca)	2018/08/13	2.9		%	20
			Dissolved Iron (Fe)	2018/08/13	NC		%	20
			Dissolved Magnesium (Mg)	2018/08/13	2.2		%	20
			Dissolved Manganese (Mn)	2018/08/13	NC		%	20
			Dissolved Potassium (K)	2018/08/13	4.9		%	20
			Dissolved Sodium (Na)	2018/08/13	13		%	20
9100680	LCA	Matrix Spike	Total Suspended Solids	2018/08/14		95	%	80 - 120
9100680	LCA	Spiked Blank	Total Suspended Solids	2018/08/14		101	%	80 - 120
9100680	LCA	Method Blank	Total Suspended Solids	2018/08/14	<1.0		mg/L	
9100680	LCA	RPD	Total Suspended Solids	2018/08/14	0		%	20
9100683	HP5	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/08/13		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/13		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/13		115	%	50 - 140
			Benzene	2018/08/13		102	%	50 - 140
			Toluene	2018/08/13		91	%	50 - 140
			Ethylbenzene	2018/08/13		100	%	50 - 140
			m & p-Xylene	2018/08/13		97	%	50 - 140
			o-Xylene	2018/08/13		100	%	50 - 140
			F1 (C6-C10)	2018/08/13		85	%	60 - 140
9100683	HP5	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/13		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/13		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/13		126	%	50 - 140
			Benzene	2018/08/13		96	%	60 - 130
			Toluene	2018/08/13		86	%	60 - 130
			Ethylbenzene	2018/08/13		95	%	60 - 130
			m & p-Xylene	2018/08/13		92	%	60 - 130
			o-Xylene	2018/08/13		96	%	60 - 130
			F1 (C6-C10)	2018/08/13		108	%	60 - 140
9100683	HP5	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/13		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/13		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/13		116	%	50 - 140
			Benzene	2018/08/13	<0.00040		mg/L	
			Toluene	2018/08/13	<0.00040		mg/L	
			Ethylbenzene	2018/08/13	<0.00040		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			m & p-Xylene	2018/08/13	<0.00080		mg/L	
			o-Xylene	2018/08/13	<0.00040		mg/L	
			F1 (C6-C10)	2018/08/13	<0.10		mg/L	
9100683	HP5	RPD	Benzene	2018/08/13	NC		%	30
			Toluene	2018/08/13	NC		%	30
			Ethylbenzene	2018/08/13	NC		%	30
			m & p-Xylene	2018/08/13	NC		%	30
			o-Xylene	2018/08/13	NC		%	30
			F1 (C6-C10)	2018/08/13	NC		%	30
9101169	BC5	Matrix Spike	D10-ANTHRACENE (sur.)	2018/08/14		113	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		98	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		68	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		107	%	50 - 130
			Acenaphthene	2018/08/14		88	%	50 - 130
			Acenaphthylene	2018/08/14		95	%	50 - 130
			Acridine	2018/08/14		104	%	50 - 130
			Anthracene	2018/08/14		101	%	50 - 130
			Benzo(a)anthracene	2018/08/14		102	%	50 - 130
			Benzo(b&j)fluoranthene	2018/08/14		94	%	50 - 130
			Benzo(k)fluoranthene	2018/08/14		105	%	50 - 130
			Benzo(g,h,i)perylene	2018/08/14		85	%	50 - 130
			Benzo(c)phenanthrene	2018/08/14		121	%	50 - 130
			Benzo(a)pyrene	2018/08/14		96	%	50 - 130
			Benzo[e]pyrene	2018/08/14		100	%	50 - 130
			Chrysene	2018/08/14		108	%	50 - 130
			Dibenz(a,h)anthracene	2018/08/14		79	%	50 - 130
			Fluoranthene	2018/08/14		121	%	50 - 130
			Fluorene	2018/08/14		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/08/14		78	%	50 - 130
			1-Methylnaphthalene	2018/08/14		74	%	50 - 130
			2-Methylnaphthalene	2018/08/14		73	%	50 - 130
			Naphthalene	2018/08/14		77	%	50 - 130
			Phenanthrene	2018/08/14		97	%	50 - 130
			Perylene	2018/08/14		84	%	50 - 130
			Pyrene	2018/08/14		118	%	50 - 130
			Quinoline	2018/08/14		106	%	50 - 130
9101169	BC5	Spiked Blank	D10-ANTHRACENE (sur.)	2018/08/14		122	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		102	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		74	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		141 (1)	%	50 - 130
			Acenaphthene	2018/08/14		93	%	50 - 130
			Acenaphthylene	2018/08/14		100	%	50 - 130
			Acridine	2018/08/14		107	%	50 - 130
			Anthracene	2018/08/14		106	%	50 - 130
			Benzo(a)anthracene	2018/08/14		120	%	50 - 130
			Benzo(b&j)fluoranthene	2018/08/14		109	%	50 - 130
			Benzo(k)fluoranthene	2018/08/14		120	%	50 - 130
			Benzo(g,h,i)perylene	2018/08/14		99	%	50 - 130
			Benzo(c)phenanthrene	2018/08/14		128	%	50 - 130
			Benzo(a)pyrene	2018/08/14		111	%	50 - 130
			Benzo[e]pyrene	2018/08/14		119	%	50 - 130
			Chrysene	2018/08/14		122	%	50 - 130

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			Dibenz(a,h)anthracene	2018/08/14		92	%	50 - 130
			Fluoranthene	2018/08/14		132 (1)	%	50 - 130
			Fluorene	2018/08/14		101	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/08/14		91	%	50 - 130
			1-Methylnaphthalene	2018/08/14		76	%	50 - 130
			2-Methylnaphthalene	2018/08/14		75	%	50 - 130
			Naphthalene	2018/08/14		77	%	50 - 130
			Phenanthrene	2018/08/14		102	%	50 - 130
			Perylene	2018/08/14		96	%	50 - 130
			Pyrene	2018/08/14		138 (1)	%	50 - 130
			Quinoline	2018/08/14		104	%	50 - 130
9101169	BC5	Method Blank	D10-ANTHRACENE (sur.)	2018/08/14		116	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/14		92	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/14		61	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/14		142 (1)		50 - 130
			Acenaphthene	2018/08/14	<0.00010		mg/L	
			Acenaphthylene	2018/08/14	<0.00010		mg/L	
			Acridine	2018/08/14	<0.000050		mg/L	
			Anthracene	2018/08/14	<0.000010		mg/L	
			Benzo(a)anthracene	2018/08/14	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/08/14	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/08/14	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/08/14	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/08/14	<0.000050		mg/L	
			Benzo(a)pyrene	2018/08/14	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/08/14	<0.000050		mg/L	
			Chrysene	2018/08/14	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/08/14	<0.0000075		mg/L	
			Fluoranthene	2018/08/14	<0.000010		mg/L	
			Fluorene	2018/08/14	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/08/14	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/08/14	<0.00010		mg/L	
			2-Methylnaphthalene	2018/08/14	<0.00010		mg/L	
			Naphthalene	2018/08/14	<0.00010		mg/L	
			Phenanthrene	2018/08/14	<0.000050		mg/L	
			Perylene	2018/08/14	<0.000050		mg/L	
			Pyrene	2018/08/14	<0.000020		mg/L	
			Quinoline	2018/08/14	<0.00020		mg/L	
9101169	BC5	RPD	Acenaphthene	2018/08/14	NC		%	30
			Acenaphthylene	2018/08/14	NC		%	30
			Acridine	2018/08/14	NC		%	30
			Anthracene	2018/08/14	NC		%	30
			Benzo(a)anthracene	2018/08/14	NC		%	30
			Benzo(b&j)fluoranthene	2018/08/14	NC		%	30
			Benzo(k)fluoranthene	2018/08/14	NC		%	30
			Benzo(g,h,i)perylene	2018/08/14	NC		%	30
			Benzo(c)phenanthrene	2018/08/14	NC		%	30
			Benzo(a)pyrene	2018/08/14	NC		%	30
			Benzo[e]pyrene	2018/08/14	NC		%	30
			Chrysene	2018/08/14	NC		%	30
			Dibenz(a,h)anthracene	2018/08/14	NC		%	30
			Fluoranthene	2018/08/14	NC		%	30

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			Fluorene	2018/08/14	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/08/14	NC		%	30
			1-Methylnaphthalene	2018/08/14	NC		%	30
			2-Methylnaphthalene	2018/08/14	NC		%	30
			Naphthalene	2018/08/14	NC		%	30
			Phenanthrene	2018/08/14	NC		%	30
			Perylene	2018/08/14	NC		%	30
			Pyrene	2018/08/14	NC		%	30
			Quinoline	2018/08/14	NC		%	30
9101176	KHO	Matrix Spike	O-TERPHENYL (sur.)	2018/08/15		110	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15		107	%	60 - 140
9101176	KHO	Spiked Blank	O-TERPHENYL (sur.)	2018/08/15		114	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15		109	%	60 - 140
9101176	KHO	Method Blank	O-TERPHENYL (sur.)	2018/08/15		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/15	<0.10		mg/L	
9101176	KHO	RPD	F2 (C10-C16 Hydrocarbons)	2018/08/15	NC		%	30
9101274	MA4	Spiked Blank	pH	2018/08/14		100	%	97 - 103
9101274	MA4	RPD	pH	2018/08/14	0.15		%	N/A
9101277	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2018/08/14		99	%	80 - 120
9101277	MA4	Method Blank	Alkalinity (PP as CaCO3)	2018/08/14	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2018/08/14	<1.0		mg/L	
			Bicarbonate (HCO3)	2018/08/14	<1.0		mg/L	
			Carbonate (CO3)	2018/08/14	<1.0		mg/L	
			Hydroxide (OH)	2018/08/14	<1.0		mg/L	
9101277	MA4	RPD	Alkalinity (PP as CaCO3)	2018/08/14	NC		%	20
			Alkalinity (Total as CaCO3)	2018/08/14	1.0		%	20
			Bicarbonate (HCO3)	2018/08/14	1.0		%	20
			Carbonate (CO3)	2018/08/14	NC		%	20
			Hydroxide (OH)	2018/08/14	NC		%	20
9101278	MA4	Spiked Blank	Conductivity	2018/08/14		99	%	90 - 110
9101278	MA4	Method Blank	Conductivity	2018/08/14	<2.0		uS/cm	
9101278	MA4	RPD	Conductivity	2018/08/14	0.19		%	10
9101643	AL2	Matrix Spike	Total Ammonia (N)	2018/08/14		103	%	80 - 120
9101643	AL2	Spiked Blank	Total Ammonia (N)	2018/08/14		102	%	80 - 120
9101643	AL2	Method Blank	Total Ammonia (N)	2018/08/14	<0.015		mg/L	
9101643	AL2	RPD	Total Ammonia (N)	2018/08/14	17		%	20
9101659	AF6	Matrix Spike	Dissolved Nitrite (N)	2018/08/14		106	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/08/14		94	%	80 - 120
9101659	AF6	Spiked Blank	Dissolved Nitrite (N)	2018/08/14		103	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/08/14		94	%	80 - 120
9101659	AF6	Method Blank	Dissolved Nitrite (N)	2018/08/14	<0.010		mg/L	
			Dissolved Nitrate plus Nitrite (N)	2018/08/14	<0.020		mg/L	
9101659	AF6	RPD	Dissolved Nitrite (N)	2018/08/14	NC		%	20
			Dissolved Nitrate plus Nitrite (N)	2018/08/14	NC		%	20
9101842	GG3	Spiked Blank	Extractable (n-Hex.) Oil and grease	2018/08/14		98	%	70 - 130
9101842	GG3	Method Blank	Extractable (n-Hex.) Oil and grease	2018/08/14	<2.0		mg/L	
9102232	MRD	Matrix Spike [UB2829-01]	Dissolved Chloride (Cl)	2018/08/15		109	%	80 - 120
9102232	MRD	Spiked Blank	Dissolved Chloride (Cl)	2018/08/15		110	%	80 - 120
9102232	MRD	Method Blank	Dissolved Chloride (Cl)	2018/08/15	<1.0		mg/L	
9102232	MRD	RPD [UB2829-01]	Dissolved Chloride (Cl)	2018/08/15	NC		%	20
9102235	MRD	Matrix Spike [UB2829-01]	Dissolved Sulphate (SO4)	2018/08/15		107	%	80 - 120
9102235	MRD	Spiked Blank	Dissolved Sulphate (SO4)	2018/08/15		106	%	80 - 120

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9102235	MRD	Method Blank	Dissolved Sulphate (SO4)	2018/08/15	<1.0		mg/L	
9102235	MRD	RPD [UB2829-01]	Dissolved Sulphate (SO4)	2018/08/15	NC		%	20
9106453	JHS	Matrix Spike [UB2829-04]	Total Aluminum (Al)	2018/08/17		94	%	80 - 120
			Total Antimony (Sb)	2018/08/17		95	%	80 - 120
			Total Arsenic (As)	2018/08/17		97	%	80 - 120
			Total Beryllium (Be)	2018/08/17		96	%	80 - 120
			Total Cadmium (Cd)	2018/08/17		94	%	80 - 120
			Total Chromium (Cr)	2018/08/17		101	%	80 - 120
			Total Cobalt (Co)	2018/08/17		100	%	80 - 120
			Total Copper (Cu)	2018/08/17		99	%	80 - 120
			Total Lead (Pb)	2018/08/17		96	%	80 - 120
			Total Molybdenum (Mo)	2018/08/17		98	%	80 - 120
			Total Nickel (Ni)	2018/08/17		98	%	80 - 120
			Total Selenium (Se)	2018/08/17		97	%	80 - 120
			Total Silver (Ag)	2018/08/17		96	%	80 - 120
			Total Thallium (Tl)	2018/08/17		99	%	80 - 120
			Total Tin (Sn)	2018/08/17		96	%	80 - 120
			Total Titanium (Ti)	2018/08/17		97	%	80 - 120
			Total Uranium (U)	2018/08/17		97	%	80 - 120
			Total Vanadium (V)	2018/08/17		102	%	80 - 120
			Total Zinc (Zn)	2018/08/17		96	%	80 - 120
9106453	JHS	Spiked Blank	Total Aluminum (Al)	2018/08/17		101	%	80 - 120
			Total Antimony (Sb)	2018/08/17		97	%	80 - 120
			Total Arsenic (As)	2018/08/17		99	%	80 - 120
			Total Beryllium (Be)	2018/08/17		99	%	80 - 120
			Total Cadmium (Cd)	2018/08/17		96	%	80 - 120
			Total Chromium (Cr)	2018/08/17		102	%	80 - 120
			Total Cobalt (Co)	2018/08/17		102	%	80 - 120
			Total Copper (Cu)	2018/08/17		99	%	80 - 120
			Total Lead (Pb)	2018/08/17		98	%	80 - 120
			Total Molybdenum (Mo)	2018/08/17		100	%	80 - 120
			Total Nickel (Ni)	2018/08/17		98	%	80 - 120
			Total Selenium (Se)	2018/08/17		101	%	80 - 120
			Total Silver (Ag)	2018/08/17		98	%	80 - 120
			Total Thallium (Tl)	2018/08/17		98	%	80 - 120
			Total Tin (Sn)	2018/08/17		96	%	80 - 120
			Total Titanium (Ti)	2018/08/17		101	%	80 - 120
			Total Uranium (U)	2018/08/17		97	%	80 - 120
			Total Vanadium (V)	2018/08/17		104	%	80 - 120
			Total Zinc (Zn)	2018/08/17		98	%	80 - 120
9106453	JHS	Method Blank	Total Aluminum (Al)	2018/08/17	<0.0030		mg/L	
			Total Antimony (Sb)	2018/08/17	<0.00060		mg/L	
			Total Arsenic (As)	2018/08/17	<0.00020		mg/L	
			Total Beryllium (Be)	2018/08/17	<0.0010		mg/L	
			Total Cadmium (Cd)	2018/08/17	<0.000020		mg/L	
			Total Chromium (Cr)	2018/08/17	<0.0010		mg/L	
			Total Cobalt (Co)	2018/08/17	<0.00030		mg/L	
			Total Copper (Cu)	2018/08/17	<0.00020		mg/L	
			Total Lead (Pb)	2018/08/17	<0.00020		mg/L	
			Total Molybdenum (Mo)	2018/08/17	<0.00020		mg/L	
			Total Nickel (Ni)	2018/08/17	<0.00050		mg/L	
			Total Selenium (Se)	2018/08/17	<0.00020		mg/L	

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			Total Silver (Ag)	2018/08/17	<0.00010		mg/L	
			Total Thallium (Tl)	2018/08/17	<0.00020		mg/L	
			Total Tin (Sn)	2018/08/17	<0.0010		mg/L	
			Total Titanium (Ti)	2018/08/17	<0.0010		mg/L	
			Total Uranium (U)	2018/08/17	<0.00010		mg/L	
			Total Vanadium (V)	2018/08/17	<0.0010		mg/L	
			Total Zinc (Zn)	2018/08/17	<0.0030		mg/L	
9106453	JHS	RPD	Total Aluminum (Al)	2018/08/17	8.9		%	20
			Total Antimony (Sb)	2018/08/17	NC		%	20
			Total Arsenic (As)	2018/08/17	2.3		%	20
			Total Beryllium (Be)	2018/08/17	NC		%	20
			Total Cadmium (Cd)	2018/08/17	15		%	20
			Total Chromium (Cr)	2018/08/17	NC		%	20
			Total Cobalt (Co)	2018/08/17	2.6		%	20
			Total Copper (Cu)	2018/08/17	18		%	20
			Total Lead (Pb)	2018/08/17	5.5		%	20
			Total Molybdenum (Mo)	2018/08/17	0.38		%	20
			Total Nickel (Ni)	2018/08/17	2.6		%	20
			Total Selenium (Se)	2018/08/17	6.4		%	20
			Total Silver (Ag)	2018/08/17	9.5		%	20
			Total Thallium (Tl)	2018/08/17	NC		%	20
			Total Tin (Sn)	2018/08/17	NC		%	20
			Total Titanium (Ti)	2018/08/17	NC		%	20
			Total Uranium (U)	2018/08/17	0.50		%	20
			Total Vanadium (V)	2018/08/17	10		%	20
			Total Zinc (Zn)	2018/08/17	1.5		%	20
9106454	ACY	Matrix Spike	Total Barium (Ba)	2018/08/17		87	%	80 - 120
			Total Boron (B)	2018/08/17		91	%	80 - 120
			Total Calcium (Ca)	2018/08/17		NC	%	80 - 120
			Total Iron (Fe)	2018/08/17		NC	%	80 - 120
			Total Lithium (Li)	2018/08/17		91	%	80 - 120
			Total Magnesium (Mg)	2018/08/17		NC	%	80 - 120
			Total Manganese (Mn)	2018/08/17		89	%	80 - 120
			Total Phosphorus (P)	2018/08/17		94	%	80 - 120
			Total Potassium (K)	2018/08/17		NC	%	80 - 120
			Total Silicon (Si)	2018/08/17		95	%	80 - 120
			Total Sodium (Na)	2018/08/17		NC	%	80 - 120
			Total Strontium (Sr)	2018/08/17		87	%	80 - 120
9106454	ACY	Spiked Blank	Total Barium (Ba)	2018/08/17		95	%	80 - 120
			Total Boron (B)	2018/08/17		98	%	80 - 120
			Total Calcium (Ca)	2018/08/17		97	%	80 - 120
			Total Iron (Fe)	2018/08/17		99	%	80 - 120
			Total Lithium (Li)	2018/08/17		96	%	80 - 120
			Total Magnesium (Mg)	2018/08/17		98	%	80 - 120
			Total Manganese (Mn)	2018/08/17		97	%	80 - 120
			Total Phosphorus (P)	2018/08/17		96	%	80 - 120
			Total Potassium (K)	2018/08/17		96	%	80 - 120
			Total Silicon (Si)	2018/08/17		100	%	80 - 120
			Total Sodium (Na)	2018/08/17		98	%	80 - 120
			Total Strontium (Sr)	2018/08/17		97	%	80 - 120
9106454	ACY	Method Blank	Total Barium (Ba)	2018/08/17	<0.010		mg/L	
			Total Boron (B)	2018/08/17	<0.020		mg/L	

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Maxxam Job #: B867483
Report Date: 2018/09/05

STANTEC CONSULTING LTD
Client Project #: 110220176
Site Location: CBA
Sampler Initials: LA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Calcium (Ca)	2018/08/17	<0.30		mg/L	
			Total Iron (Fe)	2018/08/17	<0.060		mg/L	
			Total Lithium (Li)	2018/08/17	<0.020		mg/L	
			Total Magnesium (Mg)	2018/08/17	<0.20		mg/L	
			Total Manganese (Mn)	2018/08/17	<0.0040		mg/L	
			Total Phosphorus (P)	2018/08/17	<0.10		mg/L	
			Total Potassium (K)	2018/08/17	<0.30		mg/L	
			Total Silicon (Si)	2018/08/17	<0.10		mg/L	
			Total Sodium (Na)	2018/08/17	<0.50		mg/L	
			Total Strontium (Sr)	2018/08/17	<0.020		mg/L	
			Total Sulphur (S)	2018/08/17	<0.20		mg/L	
9106454	ACY	RPD	Total Barium (Ba)	2018/08/17	NC		%	20
			Total Boron (B)	2018/08/17	0.32		%	20
			Total Calcium (Ca)	2018/08/17	1.2		%	20
			Total Iron (Fe)	2018/08/17	2.2		%	20
			Total Lithium (Li)	2018/08/17	11		%	20
			Total Magnesium (Mg)	2018/08/17	1.6		%	20
			Total Manganese (Mn)	2018/08/17	1.4		%	20
			Total Phosphorus (P)	2018/08/17	NC		%	20
			Total Potassium (K)	2018/08/17	1.6		%	20
			Total Silicon (Si)	2018/08/17	1.1		%	20
			Total Sodium (Na)	2018/08/17	0.13		%	20
			Total Strontium (Sr)	2018/08/17	1.5		%	20
			Total Sulphur (S)	2018/08/17	2.1		%	20
9106764	YY	Matrix Spike	Phenols	2018/08/17		98	%	80 - 120
9106764	YY	Spiked Blank	Phenols	2018/08/17		91	%	80 - 120
9106764	YY	Method Blank	Phenols	2018/08/17	<0.0020		mg/L	
9106764	YY	RPD	Phenols	2018/08/17	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Client Project #: 110220176
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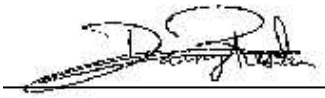
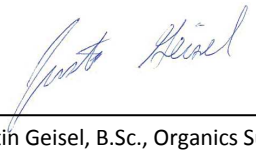
VALIDATION SIGNATURE PAGE

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



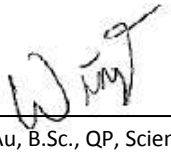
Daniel Reslan, cCT, QP, Organics Manager

Geraldlyn Gouthro, Client Service Specialist



Justin Geisel, B.Sc., Organics Supervisor

Poonam Sharma, cCT, Organics Supervisor



Winnie Au, B.Sc., QP, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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maxxam.ca

612 **CHAIN OF CUSTODY RECORD** M 086442 Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: Stantec	Company:	Quotation #:	[x] 5 - 7 Days Regular (Most analyses)
Contact Name: Lindsay Van Noortwyk	Contact Name:	P.O. #/ AFE#: 110220176	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 10160 112 St NW Edmonton AB T5K 2L6	Address:	Project #: 110220176	Rush TAT (Surcharges will be applied)
Phone: 780 232 1114	Phone:	Site Location: CBA	[ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3-4 Days
Email: Lindsay.VanNoortwyk@stantec.com	Email:	Site #:	Date Required:
Copies:	Copies:	Sampled By: LA	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID	Temp
Seal Present	✓			
Seal Intact	✓			
Cooling Media	✓			
	YES	NO	Cooler ID	Temp
Seal Present	✓			
Seal Intact	✓			
Cooling Media	✓			
	YES	NO	Cooler ID	Temp
Seal Present				
Seal Intact				
Cooling Media				

Depot Reception
RECEIVED IN YELLOWKNIFE
By: Coreta Monkton
2018 -08- 12
ice yes ✓
sealed yes ✓
10:00
Temp: 1 2 1

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot ☒ Diss ☐	Mercury Total ☐ Dissolved ☐	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	TSS	Nitrogen/Ammonia	Oil+Grease(Total)	Total Phenols	PAH	PFAS (17 Parameter)	Low Detection Limit			HOLD - DO NOT ANALYZE
1	Trip Blank-02		2018/08/09	1630	W	14		X		X	X						X	X	X	X	X	X				
2	Field Blank-02		2018/08/09	1640	W	2																X				
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
	Please indicate Filtered, Preserved or Both (F, P, F/P)										P															

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water
- [ ] D50 (Drilling Waste)
- [ ] Saskatchewan
- [ ] Other:

Special Instructions

"Trip Blank-02" labelled in pencil above pre printed trip blank label

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Luke Anderson	2018/08/10	1005	RACHEL BERNARD	20180813	11:19	B867483

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

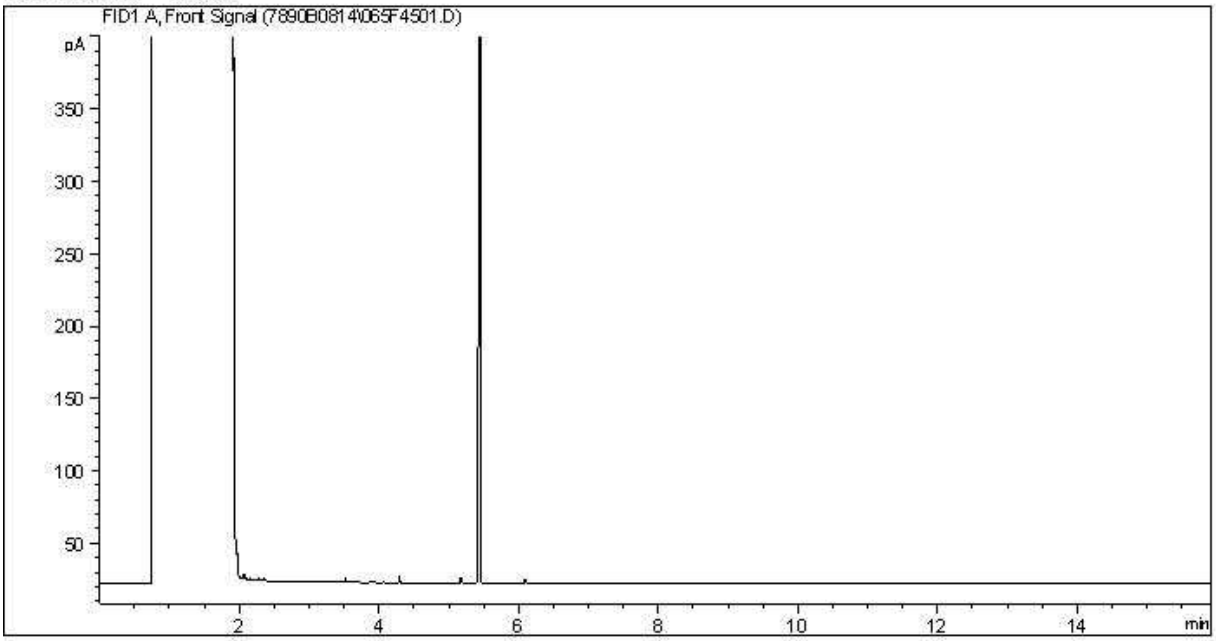
AB FCD-00331/7

Maxxam Job #: B867483
Report Date: 2018/09/05
Maxxam Sample: UB2829

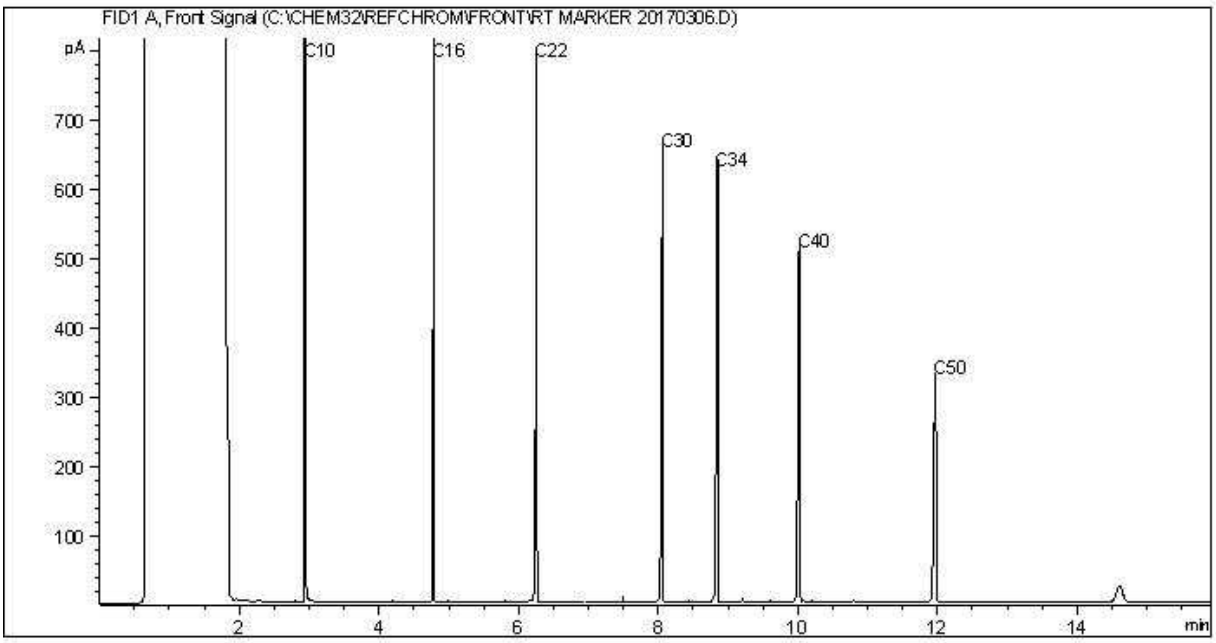
STANTEC CONSULTING LTD
Client Project #: 110220176
Site Reference: CBA
Client ID: TRIP BLANK-02

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

APPENDIX E

Photographic Log

Photograph 1: North view of Apron LTU during tilling, August 12, 2018

Photograph 2: Northwest view of Apron LTU after tilling, August 13, 2018

Photograph 3: West view of Apron LTU sump during initiation of de-watering, August 15, 2018.

Photograph 4: West view of Apron LTU sump during de-watering, August 16, 2018

Photograph 5: Southwest view of de-watered Apron LTU Sump, August 17, 2018.