# Phase Two Environmental Site Assessment

2155 Country Club Drive, Areas A & B

Burlington, Ontario

## Prepared For:

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# 1.0 Executive Summary

DS Consultants Ltd. (DS) was retained by Millcroft Greens Corporation (the "Client") to conduct a Phase Two Environmental Site Assessment (ESA) of the Property located at 2155 Country Club Drive, Areas A & B, Burlington, Ontario, herein referred to as the "Phase Two Property".

The Phase Two Property is a part of a larger parcel that has been used for commercial purposes (Millcroft Golf Course). In this report the Property refers only to the golf course portion of the parcel located to the south of Millcroft Park Drive, referred to as Areas A & B. DS understands that the Property is intended to be redeveloped from its current commercial use to a residential property use. The Property covers an approximate area of 9.48 hectares (approximately 28.5 acres) and comprises two holes of the Millcroft Golf Course.

Given that the proposed change in property use is to a more sensitive property use, the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment, Conservation, and Parks (MECP) will be mandated under O.Reg. 153/04 (as amended).

The Phase Two ESA was completed to satisfy the intent of the requirements, methodology and practices for a Phase Two ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

DS conducted a Phase One ESA for the Property dated November 2018 (revised July 2020, and again November 2020). According to the Phase One ESA findings, the Property was first developed for agricultural purposes and has been used as a golf course since the late 1980's. A total of three (3) Potentially Contaminating Activities (PCAs) were identified in the Phase One ESA, which were considered to be contributing to three (3) APECs on the Phase Two Property. A summary of the APECs, associated PCAs, and contaminants of potential concern (COPC) identified is presented in the table below:

**Table 1-1: Summary of APECs, PCAs, and COPCs**

| APEC[1] | Location of APEC on Phase One Property | PCA | Location of PCA | COPCs | Media Potentially Impacted |
|---|---|---|---|---|---|
| APEC #1 Use of possible Pesticides | Entire Property | PCA# 40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, | On-Site | OC pesticides | Soil, Ground water |

| | | | | | |
|---|---|---|---|---|---|
| | | Processing, Bulk Storage and Large-Scale Applications | | | |
| APEC #2 Use of fill materials | Within the Property | PCA#30. Importation of Fill Material of Unknown Quality | On-Site | Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PHCs, VOCs | Soil, Ground water |
| APEC #3 Presence of CNR | Southeast of the Property | PCA#46. Rail Yards, Tracks and Spurs | Off-Site | PAHs | Soil |

*Note:*
1. Area of potential environmental concern (APEC) means the area on, in or under the Property where one or more contaminants are potentially present.

Based on the findings of the Phase One ESA it was concluded that a Phase Two ESA is warranted in order to assess the soil and groundwater conditions at the Property.

The Phase Two ESA involved the advancement of nine (9) boreholes, which was completed between December 18 and 20, 2018. The boreholes were advanced to a maximum depth of 6.3 metres below ground surface (mbgs) under the supervision of DS personnel. The subsurface investigation was conducted in conjunction with geotechnical and hydrogeological investigations. Groundwater monitoring wells were installed in seven (7) of the boreholes to facilitate the collection of groundwater samples and the assessment of groundwater flow direction. The borehole locations were determined based on the findings of the Phase One ESA. All APECs were investigated with boreholes and/or monitoring wells in accordance with the requirements of O.Reg. 153/04 (as amended). Soil and groundwater samples were collected and submitted for analysis of all PCOCs, including: Petroleum Hydrocarbons (PHCs), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylene (BTEX), Metals and Other Regulated Parameters (ORPs), and Organochlorine Pesticides (OCPs).

The analytical results were compared to the "Table 8: Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition for all types of property use as contained in the MECP document entitled, "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*" dated April 15, 2011 (Table 8 Standards) for all property use.

Based on the findings of the Phase Two ESA, DS presents the following findings:

- The stratigraphy beneath the investigated areas of the Property generally consisted of fill to depths of 0.8 to 1.9m below grade. The fill was comprised of clayey silt, trace rootlets, and

trace topsoil. Native soil consisting of clayey silt to sandy silt till was found in all of the boreholes below the fill material, extending to a clayey silt till/shale complex or the shale bedrock. Shale bedrock of Queenston Formation was encountered at most borehole locations, below depths ranging from 1.5 to 6.1m, corresponding to Elevations 135.6 to 138.3 metres above sea level (masl).

- A total of nineteen (19) soil samples from borehole locations, including one quality control (QC) duplicate were submitted for chemical analysis of PHCs (F1-F4), BTEX, VOCs, PAHs, OCPs and metals and ORPs.
- The result of chemical analyses for soil revealed no exceedances of the applicable site condition Standards (Table 8) for parameters analyzed. All the samples met the MECP Table 8 SCS.
- A total of twenty four (24) ground water samples including a QC from the installed 7 monitoring wells on the Property were analysed for PHCs (F1-F4), BTEX, VOCs, PAHs, OCPs and metals and ORPs.
- No exceedances of the applicable Standards for parameters analyzed were found in any of the ground water samples analyzed. All other ground water samples met the MECP Table 8 SCS.
- According to the Certificate of Analysis, the pH of the soil and ground water samples was within the acceptable values of the MECP Guideline ( 5 to 9).
- All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required.

It is the opinion of the $QP_{ESA}$ that the applicable SCS for the soil and groundwater at the Phase Two Property have been met as of the Certification Date of January 2, 2019. No further sub-surface investigation is required regarding the environmental quality of the soil and groundwater at the Phase Two Property.

# 2.0 Introduction

DS Consultants Ltd. (DS) was retained by Millcroft Greens Corporation to complete a Phase Two Environmental Site Assessment (ESA) of the Property located at 2155 Country Club Drive, Areas A & B, Burlington, Ontario, herein referred to as the "Phase Two Property". It is DS's understanding that this Phase Two ESA has been requested for due diligence purposes in association with the proposed redevelopment of the Property. DS understands that this Phase Two ESA may be used to support the filing of a Record of Site Condition (RSC) as part of the proposed redevelopment of the Site for residential purposes. The Property has been used as a golf course. Given that the proposed change in property use is to a more sensitive property use, the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment, Conservation, and Parks (MECP) will be mandated under O.Reg. 153/04 (as amended).

The Phase Two ESA was completed to satisfy the intent of the requirements, methodology and practices for a Phase One ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

## 2.1 Site Description

The Phase Two Property is a 9.48 hectare (28.5 acres) parcel of land situated in the City of Burlington, Ontario. The Phase Two Property is located to the north of Upper Middle Road, approximately 0.5 km west of Appleby Line in a mixed residential, commercial, and open space area of City of Burlington. The Phase One Property is situated between Country Club Drive to the west, and the CNR railway line to the east. A tributary of Appleby Creek is located to the west of the Property. The Property was occupied by two holes of the Millcroft Golf Course at the time of this investigation. A man made stormwater management pond is located to the southwest portion of the Property. A Site Location Plan is provided in Figure 1.

For the purposes of this report, Upper Middle Road is assumed to be aligned in an east-west direction and Country Club Drive in a north-south direction. A Plan of Survey for the Property dated August 2018 and prepared by Randy Pentex & Edward Surveying Ltd, an Ontario Land Surveyor, has been provided under **Appendix A**.

Additional details regarding the Phase Two Property are provided in the tables below.

**Table 2-1: Phase Two Property Information West Hole, Area A**

| Phase One Property | Information | Source |
|---|---|---|
| Legal Description | PT Lot 8 Con 1 SDS Pt 1, 20R9030 Block 107 Plan 20M414 | Land Registry Office |
| Property Identification Number (PIN) | 07182-0254 (LT) | Land Registry Office |
| Municipal Address | 2155 Country Club Drive | City of Burlington, online-information |
| Zoning | O1 (open space) | City of Burlington, online information (Map No. 24 – Zoning Map) |

**Table 2-2: Phase Two Property Information East Hole, Area B**

| Phase One Property | Information | Source |
|---|---|---|
| Legal Description | Block 108 Plan 20M414 | Land Registry Office |
| Property Identification Number (PIN) | 07182-0255 (LT) | Land Registry Office |
| Municipal Address | 2155 Country Club Drive | City of Burlington, online-information |
| Zoning | O1 (open space) | City of Burlington, online information (Map No. 24 – Zoning Map) |

## 2.2 Property Ownership

The ownership details for the Phase Two Property are provided in the table below.

**Table 2-3: Phase Two Property Ownership**

| Property Owner | Address | Contact Name | Source |
|---|---|---|---|
| 2079610 Ontario Limited | 2155 Country Club Drive<br>Burlington, Ontario<br>Canada<br>L7M 4A8 | Mr. Ed Liptay<br>Phone: 289-242-0299 | Land Registry Office |

## 2.3 Current and Proposed Future Use

The Phase Two Property is currently comprised of two holes (Area A & B) of the Millcroft Golf Course which is considered to be Commercial Property Use under O.Reg. 153/04 (as amended). A residential development has been proposed for the Property. This proposed development represents a change to a more sensitive property use and therefore section 168.3.1 of the Environmental Protection Act would require mandatory filing of a Record of Site Condition prior to the change in use of the Property.

## 2.4 Applicable Site Condition Standards

The Phase Two Property is a commercial property located within the City of Burlington, and the proposed future land use is residential.

Under Section 41 of O.Reg. 153/04 (as amended), the Site is classified as "environmentally sensitive" if the pH of the surface soil (ground surface to 1.5 metres below ground surface) is less than 5 or greater than 9, if the subsurface soil (deeper than 1.5 mbgs) is less than 5 or greater than 11, or if the Site is considered to be an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance.

Soil samples were analyzed for pH as part of this Phase Two ESA, the results of which indicated that no samples were outside of the acceptable range, The Property is not considered to be an area of natural significance, however, the Property is located within 30 m of water body as such the Phase Two Property is considered to be environmentally sensitive.

The applicable Site Condition Standards (SCS) for the Phase Two Property are considered by the Qualified Person (QP) to be the Table 8 SCS: Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Ground Water Condition for Residential/Parkland/Institutional Use as contained in the April 15, 2011 Ontario Ministry of Environment, Conservation, and Parks (MECP) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", herein referred to as the "Table 8 SCS".

The selection of the Table 8 SCS is considered appropriate based on the following rationale:

- The Site is located within 30 m of a water body;
- The pH of the soils analyzed during this Phase Two ESA are within the accepted range specified under O.Reg. 153/04 (as amended); and
- Bedrock was not encountered within 2 metres of the ground surface.

# 3.0 Background Information

## 3.1 Physical Setting

### 3.1.1 Water Bodies and Areas of Natural Significance

A tributary of Appleby Creek is located to the west of the west hole (Area A). A man-made pond is located on the southwestern portion of the Property. There are no lakes or lagoons on the Property.

The following databases were reviewed to determine if any Areas of Natural Significance are present in the Property or within the Study Area:

I. An area reserved or set apart as a provincial park or conservation reserve under the *Provincial Parks and Conservation Reserves Act, 2006*.
II. An area of natural and scientific interest (life science or earth science) identified by the Ministry of Natural Resources as having provincial significance.
III. A wetland identified by the Ministry of Natural Resources as having provincial significance.
IV. An area designated by a municipality in its official plan as environmentally significant, however expressed, including designations of areas as environmentally sensitive, as being of environmental concern and as being ecologically significant.
V. An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act*.
VI. An area identified by the Ministry of Natural Resources as significant habitat of a threatened or endangered species.
VII. An area which is habitat of a species that is classified under section 7 of the *Endangered Species Act, 2007* as a threatened or endangered species.
VIII. Property within an area designated as a natural core area or natural linkage area within the area to which the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act, 2001* applies.
IX. An area set apart as a wilderness area under the *Wilderness Areas Act*.

The Phase Two Property includes no areas of Natural Significance.

### 3.1.2 Topography and Surface Water Draining Features

The Phase Two Property is located in an urban setting, at an elevation of approximately 140 metres above sea level (masl). The topography of the Phase Two Property is generally flat. According to the Conservation Halton, the Property is located in the Appleby Creek Watershed. A tributary of Appleby Creek is located to the west of the Property. The shallow groundwater flow on the Property is expected to be towards southwest-south towards the tributary of Appleby Creek and eventually towards Lake Ontario.

## 3.2 Past Investigations

DS prepared the following reports for the Property:

- Phase One ESA, titled "Phase One Environmental Site Assessment, 2155 Country Club Drive, Burlington, Ontario, dated November 2018.

- Geotechnical Investigation Proposed Residential Subdivision 2155 Country Club Drive, Burlington, Ontario, dated, January 21, 2019

Both reports were prepared for ARGO Development Corporation.

### 3.2.1 Previous Report Summary

**Phase One ESA-DS, November 2018**

According to the Phase One ESA report the potential contaminating activities (PCAs) within Phase One Property included the historical and current use of pesticides and importation of fill materials as follows:

- PCA# 40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.
- PCA#30. Importation of Fill Material of Unknown Quality

The CN railways line is located adjacent to the southeast property boundary. The PCAs within the Phase One Study Area included the presence of railways as follows:

- PCA#46. Rail Yards, Tracks and Spurs

Based on the findings of the Phase One ESA a Phase Two ESA was recommended.

**Geotechnical Investigation-DS January 2019**

- Nine (9) boreholes were advanced on the Property, to a maximum depth of 6.3 metres below existing grade.
- Fill material was found in all boreholes extending to depths of 0.8 to 1.9m below existing grade. The fill consisted of clayey silt, trace rootlets, trace topsoil.
- Native soil consisting of clayey silt to sandy silt till was found in all of the boreholes below the fill material.
- Shale bedrock of Queenston Formation was encountered at seven of nine borehole locations, except BH18-8 and BH18-9 which terminated in clayey silt till or clayey silt till/shale complex upon auger refusal.

# 4.0 Scope of the Investigation

The scope of the Phase Two ESA was designed to investigate the portions of the Site determined in the Phase One ESA to be Areas of Potential Environmental Concern. This Phase Two ESA was

conducted in general accordance with O.Reg. 153/04 (as amended). The scope of the investigation including the subsurface investigation, sampling, and laboratory analysis was based on the findings of the Phase One ESA and was limited to the portions of the site which were accessible.

## 4.1 Overview of Site Investigation

The following tasks were completed as part of the Phase Two ESA:

- Preparation of a Health and Safety Plan to ensure that all work was executed safely;
- Clearance of public private underground utility services prior to commencement of subsurface investigative operations;
- Preparation of a Sampling and Analysis Plan (SAP);
- Retained a MECP licenced driller to advance a total of nine (9) boreholes on the Phase Two Property, to depths ranging between 2.5 to 6.3 mbgs. Seven (7) of the boreholes were instrumented with groundwater monitoring wells upon completion. The soil lithology was logged during drilling, and representative soil samples were collected at regular intervals. The soil samples were screened for organic vapours using a RKI Eagle 2 MultiGas Detector, and examined for visual and olfactory indications of soil impacts;
- Submitted "worst case" soil samples collected from the boreholes for laboratory analysis of relevant contaminants of potential environmental concern (COPCs) as identified in the Phase One ESA;
- Conducted groundwater level measurements in the monitoring wells in order to determine the groundwater elevation, and to establish the local groundwater flow direction;
- Surveyed all monitoring wells to a geodetic benchmark;
- Developed and purged all monitoring wells prior to sampling. Groundwater samples were collected for all COPCs identified in the Phase One ESA;
- Compared all soil and groundwater analytical data to the applicable MECP SCS; and
- Prepared a Phase Two ESA Report in general accordance with O.Reg. 153/04 (as amended).

# Media Investigated

### 4.1.1 Rationale for Inclusion or Exclusion of Media

**Table 4-1: Rationale of Sampling Media**

| Media | Included or Excluded | Rationale |
|---|---|---|
| Soil | Included | Soil at the Phase Two Property was identified as being a potentially contaminated medium due to the use of pesticides to maintain the grass of the golf course, use of unknown quality fill materials and potential historical use of cinders for the construction of the adjoining rail line. |
| Groundwater | Included | Ground water at the Phase Two Property was identified as being a potentially contaminated medium as a result of above noted PCAs. |
| Sediment | Excluded | Sediment is not present on the Phase Two Property. |
| Surface Water | Excluded | A manmade pond for the storm management is located to the southwest of the Property. Surface water investigation was excluded from the scope of Phase Two ESA. However, the pond was not considered to be a media of concerns. |

### 4.1.2 Overview of Field Investigation of Media

**Table 4-2: Field Investigation of Media**

| Media | Methodology of Investigation |
|---|---|
| Soil | A total of nine (9) boreholes were advanced on the Phase Two Property, to a maximum depth of 6.3 mbgs. Soil samples were collected and submitted for analysis of all relevant PCOCs. |
| Groundwater | A total of seven (7) monitoring wells were present on the Phase Two Property at the time of the investigation. Representative groundwater samples were collected from each monitoring well and submitted for analysis of all relevant PCOCs. |

## 4.2 Phase One Conceptual Site Model

The conceptual site model has been based on the information presented in the Phase One ESA.

The following Table provides Area of Potential Environmental Concern:

**Table 4-3: Summary of APECs, PCAs, and COPCs**

| APEC[1] | Location of APEC on Phase One Property | PCA | Location of PCA | Contaminants of Potential Concern (COPCs) | Media Potentially Impacted |
|---|---|---|---|---|---|
| APEC #1<br>Historical use of Pesticides/Herbicides | Entire Property | PCA# 40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications | On-Site | OC pesticides | Soil, Groundwater |
| APEC #2<br>Use of fill materials | Within the Property | PCA#30. Importation of Fill Material of Unknown Quality | On-Site | Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PHCs, VOCs | Soil |
| APEC #3<br>Presence of CNR | Southeast of the Property | PCA#46. Presence of railway lines along the southeastern property boundary | Off-Site | PAHs | Soil |
| *Note:*<br>• area of potential environmental concern (APEC) means the area on, in or under the Phase One Property where one or more contaminants are potentially present. | | | | | |

Source: (Refer to clause 16(2)a, Table 2, Schedule D, O. Reg. 153/04)

**Underground Utilities:** Utilities servicing the Phase One Property are underground and the Property includes no structures. Based on the locations of the services with respect to the issues of potential environmental concern that have been identified on the Phase One Property, the potential for underground utility trenches to affect contaminant distribution and transport is considered to be low.

**Regional and Hydrogeological Information:** The near surface soil at and in the vicinity of the Phase One Property generally consists of clay to silty till. These are underlain by the Upper Ordovician,

Queenston Formation. The Queenston Formation consists of shale, limestone, dolostone and siltstone.

The near surface/shallow ground water flow direction below the Property is interpreted to be to the southwest-south, towards Appleby Creek and finally towards Lake Ontario.

Phase One Property information obtained through historical records and databases reviewed as part of this investigation are subject to the nature and accuracy of the records provided to DS. As a result of changes or additional details within these records or databases the conclusions of this Phase One ESA may be affected.

Information used in this report was evaluated based on proximity to the Phase One Property, anticipated direction of local groundwater flow, and the potential environmental impact on the Phase One Property as a result of potentially contaminating activities.

Freedom of Information records request was forwarded to the Ministry of Environment. The response from the Ministry revealed a permit to take water in 2005.

It should be noted that general environmental management and housekeeping practices were reviewed as part of this assessment with respect to their impact on the environmental condition of the Property; however, a detailed review of regulatory compliance issues was beyond the scope of our investigation. This Phase One ESA does not constitute an audit of environmental management practices, indicate geotechnical conditions or identify geologic hazards.

The QP has determined that the uncertainty does not affect the validity of the Phase One ESA Conceptual Site Model or the conclusions of this report. The Phase One Conceptual Site Model has been presented in Figure 5.

### 4.3 Deviations from Sampling and Analysis Plan

The Phase Two ESA was completed in accordance with DS sampling analysis plan (SAP).

### 4.4 Impediments

There were no physical impediments or denial of access with respect to the sampling and analysis plan developed for this Phase Two ESA.

## 5.0 Investigation Method

### 5.1 General

The Phase Two ESA followed the methodology outlined in the following documents:

- Ontario Ministry of the Environment “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario” (December 1996);
- Ontario Ministry of the Environment “Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04” (June 2011);

- Ontario Ministry of the Environment "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" (July 2011) (Analytical Protocol);

The methods used in the Phase Two ESA investigation did not differ from the associated standard operating procedures.

## 5.2 Drilling and Excavating

A site visit was conducted prior to drilling in order to identify the borehole locations based on the APECs identified in the Phase One ESA. The selected borehole locations are presented on Figure 2. The borehole locations were cleared of underground public and private utility services prior to commencement of drilling. A summary of the drilling activities is provided in the table below.

**Table 5-1: Summary of Drilling Activities**

| Parameter | Details |
|---|---|
| Drilling Contractor | Terra Firma Environmental Services Ltd (Terrafirma)<br>84 Martin Ross Ave., Toronto, ON M3J 2L4 |
| Drilling Dates | December 18, 2018, December 19, 2018, December 20, 2018 |
| Drilling Equipment Used | Geoprobe 7822DT |
| Measures taken to minimize the potential for cross contamination | Soil sampling was conducted using a 50 mm stainless steel split spoon sampler. The split spoon sampler was brushed clean of soil, washed in municipal water containing phosphate free detergent, rinsed in municipal water, and then rinsed with distilled water for each sampling interval in order to reduce the potential for cross contamination;<br>Soil samples were extracted from the interior of the sampler rather than from areas in contact with the sampler sidewalls;<br>Use of dedicated and disposable acrylonitrile gloves for the handling of soil samples. A new set of gloves was used for each sample. |
| Sample collection frequency | Samples were collected at a frequency of every 0.6 m per 0.8 m from the ground surface to 3.1 mbgs, followed by one sample per 1.5 m to borehole termination depth. |

## 5.3 Soil Sampling

Soil samples were collected using laboratory supply sampling containers, nitrile gloves, coolers with loose ice, and headspace readings were performed using a RKI Eagle 2, Model 5101-P2. Discrete soil samples were collected from the split-spoon samplers by DS personnel using dedicated acrylonitrile gloves.

A portion of each sample was placed in a resealable plastic bag for field screening, and the remaining portion was placed into laboratory supplied glass sampling jars. Samples intended for VOC and the

F1 fraction of petroleum hydrocarbons analysis were collected using a laboratory-supplied soil core sampler, placed into the vials containing methanol for preservation purposes and sealed using Teflon lined septa lids. All sample jars were stored in dedicated coolers with ice for storage, pending transport to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

The subsurface soil conditions were logged by DS personnel at the time of drilling and recorded on field borehole logs. The borehole logs are presented under **Appendix B**. Additional detail regarding the lithology encountered in the boreholes is presented under Section 6.1 and depicted visually in Figures 8A and 8B.

## 5.4 Field Screening Measurements

All retrieved soil samples were screened in the field for visual and olfactory observations. No obvious visual or olfactory evidence of potential contamination were noted. No aesthetic impacts (e.g. cinders, slag, hydrocarbon odours) were encountered during this investigation. The soil sample headspace vapour concentrations for all soil samples recovered during the investigation were screened using portable organic vapour testing equipment in accordance with the procedure outlined in the MECP's '*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario'.*

The soil samples were inspected and examined to assess soil type, ground water conditions, and possible chemical contamination by visual and olfactory observations or by organic vapour screening. Samples submitted for chemical analysis were collected from locations judged by the assessor to be most likely to exhibit the highest concentrations of contaminants based on several factors including (i) visual or olfactory observations, (ii) sample location, depth, and soil type (iii) ground water conditions and headspace reading. A summary of the equipment used for field screening is provided below:

**Table 5-2: Field Screening Equipment**

| Parameter | Details |
|---|---|
| Make and Model of Field Screening Instrument | RKI Eagle 2, Model 5101-P2<br>Serial Number: E2G721 |
| Chemicals the equipment can detect and associated detection limits | VOCs with dynamic range of 0 parts per million (ppm) to 2,000 ppm PHCs with range of 0 to 50, 000 ppm |
| Precision of the measurements | 3 significant figures |
| Accuracy of the measurements | VOCs: ± 10% display reading + one digit |

| Parameter | Details |
|---|---|
| | Hydrocarbons: ± 5% display reading + one digit |
| Calibration reference standards | PID: Isobutylene<br>CGD: Hexane |
| Procedures for checking calibration of equipment | In-field re-calibration of the CGI was conducted (using the gas standard in accordance with the operator's manual instructions) if the calibration check indicated that he calibration had drifted by more than +/- 10%. |

A summary of the soil headspace measurements is provided in the borehole logs, appended under **Appendix B**.

## 5.5 Groundwater Monitoring Well Installation

Monitoring wells were installed upon completion of the boreholes advanced on the Phase Two Property. The monitoring wells were constructed of 51-millimetre (2-inch) inner diameter (ID) flush-threaded schedule 40 polyvinyl chloride (PVC) risers, equipped with a 3.1 m or 1.5 m length of No. 10 slot PVC screen. The well screens were sealed at the bottom using a threaded cap and at the top with a lockable J-plug.

Silica sand was placed around and up to 0.6m above the well screen to act as a filter pack. Bentonite was placed from the ground surface to the top of the sand pack. The wells were completed with protective flush mount casings.

Details regarding the monitoring well construction can be found in Table 1, and on the borehole logs provided in **Appendix B**.

Disposable acrylonitrile gloves were used to minimize the potential for cross-contamination during well installation. Dedicated equipment was used for well development and sampling to further minimize the risk of cross contamination.

The monitoring wells were developed on January 4, 2019. In accordance with DS SOPs for monitoring well development, the wells were developed by removing a minimum of three standing water column volumes using dedicated inertial pumps comprised of Waterra polyethylene tubing and dedicated foot valves.

## 5.6 Groundwater Field Measurement of Water Quality Parameters

The monitoring wells were developed by purging the wells by using Waterra. The monitoring wells were then purged by removing approximately three (3) casing volumes or until the well was dry.

Ground water had a slow recovery. The details of the individual monitoring wells are shown on the borehole logs in **Appendix A**.

## 5.7 Groundwater Sampling

Groundwater samples were collected a minimum of 24 hours after the development of the monitoring wells. The Groundwater samples were collected using dedicated inertial pumps comprised of Waterra tubing equipped with dedicated foot valves.

Groundwater samples for metals analysis were field filtered using dedicated 0.45 micron in-line filters. The groundwater was transferred directly into laboratory supplied containers and preserved as appropriate using the containers supplied by the analytical laboratory. The samples were placed in coolers upon completion of sampling and stored on ice for storage, pending transport to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

## 5.8 Sediment Sampling

Sampling the Mill Pond was excluded from the Phase Two ESA. The Phase Two ESA included the west and east holes (Areas A and B respectfully). No sediment as defined under O.Reg. 153/04 (as amended) was present on the Phase Two Property at the time of this investigation. Sediment sampling was not conducted as a result.

## 5.9 Analytical Testing

The soil and groundwater samples collected were submitted to ALS Environmental under chain of custody protocols. ALS Environmental is an independent laboratory accredited by the Canadian Association for Laboratory Accreditation. ALS Environmental conducted the analyses in accordance with the MECP document "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" dated March 9, 2004 (revised on July 1, 2011).

## 5.10 Residue Management Procedures

### 5.10.1 Soil Cuttings From Drilling and Excavations

The soil cuttings generated by the borehole left at the site upon receipt of analytical result. No impacted soil was observed at the Property.

### 5.10.2 Water from Well Development and Purging

Excess water derived from well purging activities was stored in 20-L sealed plastic pails, and temporarily stored on site. Upon receipt of the analytical results it was determined that the purged groundwater meets the applicable Table 8 SCS. Based on this the purged groundwater was allowed to re-infiltrate adjacent to the monitoring wells.

### 5.10.3 Fluids from Equipment Cleaning

Excess equipment cleaning fluids were removed from the Property by driller.

## 5.11 Elevation Surveying

The ground surface elevations of the boreholes/monitoring wells were surveyed using a Sokkia GCX-2 GNSS RTK receiver as part of DS geotechnical investigation.

The ground surface elevations can be found on the borehole logs presented in **Appendix B**.

## 5.12 Quality Assurance and Quality Control Measures

### 5.12.1 Sample containers, preservation, labelling, handling and custody for samples submitted for laboratory analysis, including any deviations from the SAP

All soil and groundwater samples were stored in laboratory-supplied sample containers in accordance with the MECP Analytical Protocol. A summary of the preservatives supplied by the laboratory is provided in the table below.

**Table 5-3: Summary of Sample Bottle Preservatives**

| Media | Parameter | Sample Container |
|---|---|---|
| Soil | PHCs F1<br>VOCs | 40 mL methanol preserved glass vial with septum lid. |
| | PHCs F2-F4<br>Metals and ORPs<br>PAHs | 120 mL or 250 mL unpreserved glass jar with Teflon™-lined lid. |
| Ground water | PHCs F1<br>VOCs | 40 mL glass vial with septum lid, containing sodium bisulphate preservative. |
| | PHCs F2-F4 | 250 mL amber glass bottle with sodium bisulphate preservative |
| | PAHs | 250 mL amber glass bottle (unpreserved) |

| Media | Parameter | Sample Container |
|---|---|---|
| | Inorganics | 500 mL high density polyethylene bottle (unpreserved) |
| | Metals | 125 mL high density polyethylene bottle containing nitric acid preservative |
| | Hexavalent Chromium | 125 mL high density polyethylene bottle containing ammonium sulphate/ammonium hydroxide preservative |
| | Mercury | 125 mL glass bottle containing hydrochloric acid preservative |
| | Cyanide | 125 mL high density polyethylene bottle containing sodium hydroxide preservative |

Groundwater samples were collected using dedicated equipment for each well. Groundwater samples collected for analysis of dissolved metals, mercury and hexavalent chromium were filtered in the field using a dedicated 0.45-micron in-line filter. Each sample container was labelled with a unique sample identification, the project number, and the sampling date. All samples were placed in an ice-filled cooler upon completion of sampling and kept under refrigerated conditions until the time of delivery to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

### 5.12.2 Description of equipment cleaning procedures followed during all sampling

Dedicated, disposable nitrile gloves were used for each sampling event to reduce the potential for cross-contamination.

2-inch split spoon soil sampling device was use for each sampling event.
Dedicated equipment was used for well development and sampling for further minimize the risk of cross contamination. Non-dedicated equipment (i.e. interface probe) was cleaned before initial use and between all measurement points with a solution of Alconox™ and distilled water. The Alconox™ solution was rinsed off using distilled water.

### 5.12.3 Description of how the field quality control measures referred to in subsection 3 (3) were carried out

Field duplicate samples were collected at the time of sampling. In accordance with O.Reg. 153/04, one duplicate sample was analyzed per ten samples submitted for analysis. A laboratory prepared trip blank accompanied the groundwater samples during each sampling event and was submitted for laboratory analysis of VOCs.

All field screening devices (i.e. PID, CGD, YSI Water Quality Meter) were calibrated prior to use by the supplier. Calibration checks were completed, and re-calibrations were conducted as required.

### 5.12.4 Description of, and rational for, any deviations from the procedures set out in the quality assurance and quality control program set out in the SAP

There were no deviations from the QA/QC program described in the SAP.

# 6.0 Review and Evaluation

## 6.1 Geology

The boundaries of soil indicated on the log sheets are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change. The general stratigraphy at the Property, as observed in the boreholes, consists of clayey silt to silty clay till, silt to sandy silt and sand. No aesthetic impacts (e.g. cinders, slag, hydrocarbon odours) were encountered during this investigation. A brief description of the soil stratigraphy at the Property, in order of depth, is summarized in the following sections. Detailed information for site stratigraphy is provided in our geotechnical report (January 2019). The investigation included advancing the nine (9) boreholes and installing seven (7) monitoring wells in the selected boreholes.

The detailed soil profiles encountered in each borehole are provided on the attached borehole logs (**Appendix B**).

**Surficial Materials**

In the boreholes, a 130 to 350 mm thick layer of surficial topsoil was found. The thickness of the topsoil in each borehole was shown in the borehole log. It should be noted that the thickness of the topsoil explored at the borehole locations may not be representative for the site and should not be relied on to calculate the amount of topsoil at the site.

Underneath the topsoil, loose to compact fill material was found in all boreholes extending to depths of 0.8 to 1.9m below grade. The fill consisted of clayey silt, trace rootlets, and trace topsoil.

**Native Soil**

Native soil consisting of clayey silt to sandy silt till was found in all of the boreholes below the fill material, extending to a clayey silt till/shale complex or the shale bedrock. The clayey silt till was present in a very stiff to hard, generally hard consistency.

**Bedrock**

Shale bedrock of Queenston Formation was encountered at most borehole locations, except BH18-8 and BH18-9 which were terminated in clayey silt till or clayey silt till/shale complex upon auger refusal. The highly weathered shale was encountered below depths ranging from 1.5 to 6.1m, corresponding to Elevations 135.6 to 138.3 m as shown on the following Table.

**Table 6-1: Approximate Depth and Elevation of Shale Bedrock Surface**

| Borehole No. | Depth to Shale Bedrock Surface below Existing Ground (m) | Approximate Elevation of Shale Bedrock Surface (m) |
|---|---|---|
| BH18-1 | 6.1 | 136.7 |
| BH18-2 | 4.7 | 137.5 |
| BH18-3 | 3.4 | 138.3 |
| BH18-4 | 4.6 | 136.0 |
| BH18-5 | 4.6 | 135.6 |
| BH18-6 | 1.5 | 136.6 |
| BH18-7 | 2.3 | 136.3 |
| BH18-8 | Auger refusal at 4.6 m | Auger refusal at 135.8 |
| BH18-9 | Auger refusal at 3.9 m | Auger refusal at 136.9 |

## 6.2 Ground Water Elevations and Flow Direction

### 6.2.1 Rationale for Monitoring Well Location and Well Screen Intervals

A total of seven monitoring wells were installed on the Phase Two Property in order to assess the groundwater quality in relation to APEC-1, APEC-2, and APEC-3. The COPCs associated with these APECs were PHCs, VOCs, PAHs, OCPs, and Metals and ORPs. The monitoring wells were screened to intersect the first water bearing formation encountered, in order to allow for the assessment of LNAPL, and to provide information regarding the quality of the groundwater at the water table. The monitoring well BH18-1 was screened within the till shale complex unit encountered at an approximate depth of 3.1 mbgs. The monitoring wells BH18-2, BH18-4 and 18-9 were screened within the sandy silt till unit encountered at an approximate depth of 1.5 to 2.3 mbgs. The monitoring well BH18-5 was screened within fill encountered at an approximate depth of 0.1 mbgs. The monitoring wells BH18-6 and BH18-7 were screened within the clayey silt/clayey silt till unit encountered at an approximate depth of 0.8 to 1.5 mbgs. This unit is inferred to be an unconfined aquifer.

### 6.2.2 Results of Interface Probe Measurements

A summary of the groundwater level measurements is provided in in Table 6-2, Section 6.2.4. The groundwater level measurements were collected using a Solinst interface probe. The depth to

groundwater was found to range between 1.04 to 4.16 mbgs on January 3, 2019. There was no indication of DNAPL or LNAPL in the monitoring wells at this time.

### 6.2.3 Product Thickness and Free Flowing Product

No evidence of product was observed in the monitoring wells at the time of the investigation.

### 6.2.4 Groundwater Elevation

The groundwater elevation was calculated by subtracting the depth to groundwater from the surface elevation determined by the surface elevation survey conducted as part of this investigation. A summary of the groundwater elevations calculated is presented in the following Table.

No groundwater was found in the boreholes during drilling or upon completion of drilling, except in BH18-7 where groundwater level was measured at 2.1 m below grade upon completion of the borehole. The stabilized groundwater levels observed in the monitoring wells installed in the boreholes are listed on Table 1.

**Table 6-2: Groundwater Levels Observed in Monitoring Wells**

| BH ID | Date of installation | Date of Observation | Depth of GW (m) | Elevation of GW (m) |
|---|---|---|---|---|
| BH18-1 | December 18, 2018 | January 3, 2019<br>January 7, 2019 | 4.2<br>4.3 | 138.6<br>138.5 |
| BH18-2 | December 18, 2018 | January 3, 2019<br>January 7, 2019 | 1.1<br>1.4 | 141.1<br>140.8 |
| BH18-4 | December 19, 2018 | January 3, 2019<br>January 7, 2019 | 1.8<br>2.1 | 138.8<br>138.5 |
| BH18-5 | December 19, 2018 | January 3, 2019<br>January 7, 2019 | 2.6<br>3.4 | 137.5<br>136.7 |
| BH18-6 | December 19, 2018 | January 3, 2019<br>January 7, 2019 | 1.5<br>1.6 | 136.5<br>136.6 |
| BH18-7 | December 20, 2018 | January 3, 2019<br>January 7, 2019 | 2.1<br>2.1 | 136.5<br>136.5 |
| BH18-9 | December 20, 2018 | January 3, 2019<br>January 7, 2019 | 1.7<br>2.0 | 139.1<br>138.8 |

Ground water elevations in the monitoring wells were established using a water level probe with depth measurements referenced to geodetic top-of-casing elevations.

### 6.2.5 Groundwater Flow Direction

The groundwater flow direction was interpreted using the groundwater elevations calculated for the monitoring wells installed on the Phase Two Property. Based on the ground water levels measured in the onsite monitoring wells, shallow ground water condition is present at the Property and it is subject to vary depending on seasonal weather condition.

Based on the groundwater elevations calculated, the shallow groundwater flow on the Property is expected to follow the topography of the site and to be towards the tributary of Appleby Creek and Mill Pond located to the southwest-south of the Property and eventually to southeast towards Lake Ontario. The groundwater elevation contours and flow direction are presented on Figure 5.

### 6.2.6 Assessment of Potential for Temporal Variability in Groundwater Flow Direction

The shallow aquifer investigated is inferred to be an unconfined aquifer, based on the soil stratigraphy observed in the boreholes advanced on the Phase Two Property. It is possible that temporal variations in groundwater elevations may occur on the Phase Two Property in response to seasonal weather patterns.

Temporal variability in groundwater level has the ability to influence the groundwater flow direction. The degree of variation in groundwater levels on the Phase Two Property can only be confirmed with long-term monitoring.

### 6.2.7 Evaluation of Potential Interaction Between Buried Utilities and the Water Table

The groundwater table was encountered at depths ranging from 1.0 to 4.3 mbgs on the Phase Two Property. Ground water was not impacted and the buried utility services are not a potential to act as preferential pathways.

### 6.2.8 Horizontal Hydraulic Gradient

Concurrently with this Phase Two ESA, a hydrogeological investigation has been prepared for the Property by R.J. Burnside & Associates Limited (Burnside) in a separate cover. Detailed information for the hydrogeological condition of the Property will be provided in that report.

### 6.2.9 Vertical Hydraulic Gradient

A hydraulic gradient based on the limited number of ground water level readings and lack of installation of the nested wells may be unreliable. Information for hydraulic conductivity of the soil has been provided in the hydrogeological report. The hydraulic conductivity of values based on Hazen estimation is between $3.2x10^{-6}$ cm/sec and $2.8 x10^{-5}$ cm/sec. Based on the grain size analysis, soil has a low permeabilities and transmit ground water poorly.

## 6.3 Fine-Medium Soil Texture

Grain size analyses of seven (7) till samples (BH18-1/SS4, BH18-2/SS5, BH18-4/SS4, BH18-5/SS4, BH18-6/SS2, BH18-7/SS3, and BH18-9/SS4) were conducted and the results are presented in **Appendix D**, with the following fractions:

Clay: 5 to 18%

Silt: 29 to 61%

Sand: 22 to 40%

Gravel: 3 to 12%

The soils encountered on the Phase Two Property are considered to be medium-fine textured. It should be noted that there is no differentiation between the Site Condition Standards for medium-fine and coarse textured soils in Table 8 of the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"

### 6.3.1 Results of Grain Size Analysis

A summary of the soil samples analyzed and the corresponding grain size results is presented in the table below:

**Table 6-1: Summary of Grain Size Analyses**

| Sample | % Gravel | % Sand | % Silt | % Clay | Classification |
|---|---|---|---|---|---|
| BH18-1 SS4 | 14% | 23% | 54% | 9% | Medium-fine textured |
| BH18-2 SS5 | 5% | 26% | 61% | 8% | Medium-fine textured |
| BH18-4 SS4 | 18% | 40% | 39% | 3% | Coarse |
| BH18-5 SS4 | 17% | 28% | 29% | 26% | Medium-fine textured |
| BH18-6 SS2 | 5% | 34% | 57% | 4% | Medium-fine textured |
| BH18-7 SS3 | 16% | 22% | 46% | 16% | Medium-fine textured |
| BH18-9 SS4 | 15% | 28% | 47% | 10% | Medium-fine textured |

### 6.3.2 Rational for the Number of Samples Collected and Analyzed

The grain size analyses were conducted for the purposes of this Phase Two ESA, in addition to a geotechnical investigation which was conducted concurrently. At least one sample was analyzed per stratigraphic unit encountered in order to characterize the various strata encountered.

## 6.4 Soil Field Screening

Soil vapour headspace readings were collected at the time of sample collection, the results of which are presented on the borehole logs (**Appendix B**). The soil vapour headspace readings were collected using a PID and CGD in methane elimination mode. The PID readings were all 0 ppm (non-detectable). The CGD readings ranged between 0 and 75 ppm. The soil samples were also screened for visual and olfactory indicators of impacts (e.g. staining, odours). No significant olfactory indicators were present.

## 6.5 Soil Quality

The results of the chemical analyses conducted are presented in Tables 5 through 8. A visual summary of the location of the sample locations is provided on Figure 6. The laboratory certificates of analysis have been provided under **Appendix C**.

### 6.5.1 Metals and ORPs

A total of 6 soil samples, including 1 field duplicate for QA/QC purposes were submitted for analysis of metals and ORPs. The results of the analyses are tabulated in Table 5 and presented on Figure 6. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

**Soil pH**

The following Table presents the pH values for the soil found across the Property.

**Table 6-5: pH of Soil Samples**

| CaCl2 Extraction | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 (BH18-1 SS2) |
|---|---|---|---|---|---|---|
| pH Unit N/A | 18-Dec-2018 | 18-Dec-2018 | 18-Dec-2018 | 19-Dec-2018 | 19-Dec-2018 | 18-Dec-2018 |
| 5 to 9 for surface soil (depth less than 1.5 m) | 0.8-1.4 mbgs | 1.5-2.1 mbgs | 0.8-1.4 mbgs | 0-0.6 mbgs | 0.8-1.4 mbgs | 0.8-1.4 mbgs |
| | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 |
| | Soil | Soil | Soil | Soil | Soil | Soil |
| 5 to 11 for sub-surface soil (depth more than 1.5 m) | 7.81 | 7.81 | 7.76 | 7.40 | 7.90 | 7.80 |

Based on the above noted Table, the pH for the soil is within 7.40 to 7. 90 at the Property and within the MECP guideline.

### 6.5.2 Petroleum Hydrocarbons

A total of 3 samples were submitted for analysis of PHCs (incl. BTEX). The results of the analyses are tabulated in Table 6 and presented on Figure 6. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.5.3 Polycyclic Aromatic Hydrocarbons

A total of 4 soil samples, including 1 field duplicate for QA/QC purposes were submitted for analysis of PAHs. The results of the analyses are tabulated in Table 7 and presented on Figure 6. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.5.4 Organochlorine Pesticides

A total of 6 soil samples, including 1 field duplicate for QA/QC purposes were submitted for analysis of OCPs. The results of the analyses are tabulated in Table 8 and presented on Figure 6. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.5.5 Commentary on Soil Quality

No evidence of chemical or biological transformations of the parameters analyzed was observed.

No groundwater impacts were identified on the Phase Two Property; therefore, it is unlikely that the soil is acting as a contaminant source for groundwater.

No evidence of NAPL was observed in the samples recovered during the field investigation. All samples analyzed were well below the corresponding free-product threshold values.

Complete laboratory results are provided in **Appendix C**.

## 6.6 Ground Water Quality

The results of the chemical analyses conducted are presented in Tables 9 through 13. A visual summary of the location of the sample locations is provided on Figure 7. The laboratory certificates of analysis have been provided under **Appendix C**.

### 6.6.1 Metals and ORPs

A total of 7 ground water samples, including 1 field duplicate for QA/QC purposes were submitted for analysis of metals and ORPs. The results of the analyses are tabulated in Table 9 and presented on Figure 7. The groundwater samples transferred into the metals, mercury, and hexavalent chromium bottles were field filtered using a 0.45-micron in-line filter. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.6.2 Petroleum Hydrocarbons

A total of 4 ground water samples, including 1 field duplicates for QA/QC purposes were submitted for analysis of PHCs (incl. BTEX). The results of the analyses are tabulated in Table 10 and presented on Figure 7. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.6.3 Volatile Organic Compounds

A total of 5 samples, including 1 field duplicate for QA/QC purposes, and one Trip Blank were submitted for analysis of VOCs. The results of the analyses are tabulated in Table 11 and presented on Figure 7. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.6.4 Polycyclic Aromatic Hydrocarbons

A total of 4 ground water samples, including 1 field duplicate for QA/QC purposes were submitted for analysis of PAHs. The results of the analyses are tabulated in Table 12 and presented on Figure 7. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.6.5 Organochlorine Pesticides

A total of 4 ground water samples, including 1 field duplicates for QA/QC purposes were submitted for analysis of OC Pesticides. The results of the analyses are tabulated in Table 13 and presented on Figure 7. The results of the analyses indicated that there were no exceedances of the Table 8 SCS.

### 6.6.6 Commentary on Groundwater Quality

No evidence of chemical or biological transformations of the parameters analyzed was observed.

No soil impacts were identified on the Phase Two Property; therefore it is unlikely that the groundwater is acting as a contaminant source for soil.

No evidence of NAPL was observed in the samples recovered during the field investigation. All samples analyzed were well below the corresponding free-product threshold values.

According to the Certificate of Analysis, the pH of the ground water sample was within the acceptable values of the MECP Standards of 5 to 9 (7.4-7.9).

## 6.7 Sediment Quality

Sediment sampling from the pond was not included in the scope of work.

## 6.8 Quality Assurance and Quality Control Results

Collection of soil and groundwater samples was conducted in general accordance with the MECP *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*. As described in Section 5.12, dedicated equipment was used where possible, and all non-dedicated equipment was decontaminated before and between sampling events. All soil and groundwater samples were transferred directly into laboratory-supplied containers. The laboratory containers were prepared by the laboratory with suitable preservative, as required. All samples were stored and transported under refrigerated conditions. Chain of custody protocols were maintained from the time of sampling to delivery to the analytical laboratory.

The field QA/QC program involved the collection of field duplicate soil and groundwater samples, and the use of a trip blank for each groundwater sampling event (when suitable). In addition to the controls listed above, the analytical laboratory employed method blanks, internal laboratory duplicates, surrogate spike samples, matrix spike samples, and standard reference materials.

A summary of the field duplicate samples analyzed and an interpretation of the efficacy of the QA/QC program is provided in the table below.

**Table 6-6: Summary of QA/QC Results**

| Sample ID | QA/QC duplicate | Medium | Parameter Analyzed | QA/QC Result |
|---|---|---|---|---|
| BH18-1 SS2 | DUP1 | Soil | Metals and ORPs | All results were within the analytical protocol criteria for RPD |
| BH18-8 SS2 | DUP2 | Soil | OCPs | All results were within the analytical protocol criteria for RPD |
| BH18-6 SS1 | DUP3 | Soil | PAHs | All results were within the analytical protocol criteria for RPD |
| BH18-2 | DUP1 | Water | OCPs | All results were within the analytical protocol criteria for RPD |
| BH18-4 | DUP2 | Water | PAHs | All results were within the analytical protocol criteria for RPD |
| BH18-7 | DUP3 | Water | Metals and ORPs | All results were within the analytical protocol criteria for RPD |
| BH18-9 | DUP4 | Water | PHCs and VOCs | All results were within the analytical protocol criteria for RPD |

Based on the interpretation of the laboratory results and the QA/QC program, it is the opinion of the QP that the laboratory analytical data can be relied upon.

All samples were handled in accordance with the MECP Analytical Protocol regarding sample holding time, preservation methods, storage requirements, and type of container, with the exception of the following:

- Sample BH18-2, BH18-4, BH18-6, BH18-7, BH18-9 was collected on January 7, 2018, and submitted to ALS on January 8, 2019 for hexavalent chromium analysis. The time elapsed between the sample collection date and submittal to the laboratory for filtering (1 day) was greater than the required holding time for filtering of hexavalent chromium (same-day). While the hold time for the remaining metals was met, the sample was not field filter as mandated in the MECP Analytical Protocol. Although this sample was not handled in accordance with the Analytical protocol, the reported results are considered to be reliable due to the inherent physical and chemical properties of the analyte.
- d14-T surrogate results exceeded ALS DQO.

ALS routinely conducts internal QA/QC analyses in order to satisfy regulatory QA/QC requirements. The results of the ALSQA/QC analyses for the submitted soil samples are summarized in the laboratory Certificates of Analyses provided in **Appendix C**.

The following comments were provided by ALS on the laboratory Certificates of Analysis. Commentary on the comments has been provided below:

- Laboratory Certificate L2217334 – BH18-6 exceeded ALS DQO for d14-T surrogate results. Although the results exceeded ALS DQO it meets the Table 8 SCS requirements. Therefore, DS does not consider this result to be an issue of significant concern and it has no impact on the overall interpretation of the analytical data;

With respect to subsection 47(3) of O.Reg 153/04 (as amended), all certificates of analysis or analytical reports pursuant to clause 47(2) (b) of the regulation comply with subsection 47(3). A certificate of analysis has been received for each sample submitted for analysis and have been provided (in full) in **Appendix C**.

A review of the QA/QC sample results indicated that no issues were identified with respect to both the field collection methodology and the laboratory reporting. It is the opinion of the QP that the analytical data obtained are representative of the soil and groundwater conditions at the Phase Two Property for the purpose of assessing whether the soil and groundwater at the Phase Property meet the applicable MECP SCS.

## 6.9 Phase Two Conceptual Site Model

This Phase Two Conceptual Site Model was developed through a synthesis of the information obtained through the completion of the Phase One ESA, and the data collected as part of the Phase Two ESA.

**Description and Assessment of:**

**A. Areas where potentially contaminating activity has occurred**

A total of three PCAs were identified in the Phase One ESA. A summary of the PCAs considered to be contributing to APECs on the Phase Two Property is provided below:

***Within Phase One Property***

1. ***PCA# 40.*** *Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications*;
2. ***PCA#30.*** *Importation of Fill Material of Unknown Quality;*

***Within Phase One Study Area***

3. ***Other*** *Presence of railway lines along the southeastern property boundary.*

**B. Areas of potential environmental concern**

A total of three (3) APECs were identified to be present on the Phase Two Property through the completion of the Phase One ESA. A summary of the APECs identified, and the associated PCOCs is provided in the table below.

**Table 6-7: Summary of APECs, PCAs, and COPCs**

| APEC[1] | Location of APEC on Phase One Property | PCA | Location of PCA | PCOCs | Media Potentially Impacted |
|---|---|---|---|---|---|
| APEC #1<br>Historical use of Pesticides/Herbicides | Entire Property | PCA# 40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications | On-Site | OC pesticides | Soil, Groundwater |
| APEC #2<br>Use of fill materials | Within the Property | PCA#30. Importation of Fill | On-Site | Metals, As, Sb, Se, B-HWS, CN-, electrical | Soil |

| | | | | | |
|---|---|---|---|---|---|
| | | Material of Unknown Quality | | conductivity, Cr (VI), Hg, low or high pH, SAR PHCs, VOCs | |
| APEC #3 Presence of CNR | Southeast of the Property | Other presence of railway lines along the southeastern property boundary | Off-Site | PAHs | Soil |

*Note:*
1. area of potential environmental concern (APEC) means the area on, in or under the Phase One Property where one or more contaminants are potentially present.

**C. <u>Any subsurface structures and utilities on, in or under the Phase Two Property that may affect contaminant distribution and transport</u>**

The groundwater table was encountered at depths ranging from 1.0 to 4.3 mbgs on the Phase Two Property. No groundwater impacts were identified, therefore the potential for preferential migration of contaminants is not of concern at this time.

- **Description of, and as appropriate, figures illustrating, the physical setting of the Phase Two Property and any areas under it including:**

**A. <u>Stratigraphy from ground surface to the deepest aquifer or aquitard investigated</u>**

In the boreholes, a 130 to 350 mm thick layer of surficial topsoil was found. The thickness of the topsoil in each borehole was shown in the borehole log. It should be noted that the thickness of the topsoil explored at the borehole locations may not be representative for the site and should not be relied on to calculate the amount of topsoil at the site.

Underneath the topsoil, loose to compact fill material was found in all boreholes extending to depths of 0.8 to 1.9m below grade. The fill consisted of clayey silt, trace rootlets, and trace topsoil.

Native soil consisting of clayey silt to sandy silt till was found in all of the boreholes below the fill material, extending to a clayey silt till/shale complex or the shale bedrock. The clayey silt till was present in a very stiff to hard, generally hard consistency.

Underlying the clayey silt till and/or overlying the shale bedrock, a deposit termed clayey silt till /shale complex was encountered in some boreholes (BH18-1 and BH18-9). The deposit consisted of clayey silt till mixed with highly weathered shale. The till/shale complex was in a hard state.

Shale bedrock of Queenston Formation was encountered at most borehole locations, except BH18-8 and BH18-9 which were terminated in clayey silt till or clayey silt till/shale complex upon auger refusal. The highly weathered shale was encountered below depths ranging from 1.5 to 6.3m, corresponding to Elevations 135.6 to 138.3 m. The shale bedrock was not proven by core drilling.

The borehole locations are depicted on Figure 2. A visual representation of the stratigraphy investigated is presented on the cross-sections provided in Figures 8A through 8B.

**B. Hydrogeological Characteristics, including aquifers, aquitards and, in each hydrostratigraphic unit where one or more contaminants is present at concentrations above the applicable site condition standards, lateral and vertical gradients**

The groundwater table was encountered in the weathered shale. Based on the groundwater elevations, the groundwater flow direction is interpreted to be southwest towards Appleby Creek.

**C. Depth to bedrock**

The highly weathered shale was encountered below depths ranging from 1.5 to 6.1m, corresponding to elevations 135.6 to 138.3 masl.

**D. Approximate depth to water table**

The depth to groundwater was found to range between 1.36 to 4.27 mbgs on January 7, 2019.

**E. Any respect in which section 41 or 43.1 of the regulation applies to the property**

The pH values measured were within the acceptable limits for non-sensitive sites. There are no areas of natural significance on the Phase Two Property. However, the property located within 30 m of a water body. As such, section 43.1 of the regulation applies to the Phase Two Property. The results of the chemical analyses have been assessed against the Table 8 Standards accordingly.

**F. Areas where soil has been brought from another property and placed on, in or under the Phase Two Property**

A layer of fill material was observed from 0.8 to 1.9mbgs. Fill material is inferred to have been brought to the site for grading purposes when the golf course was constructed in the late 1980s.

**G. Approximate locations, if known, of any proposed buildings and other structures**

It is our understanding that redevelopment of the Site for residential purposes has been proposed, and that the development will feature a multi-story building with seventy-two (72) residential units.

It is further understood that the proposed development will occupy the entirety of the Phase Two Property.

- **Where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable site condition standard, identification of**

**A. Each area where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable SCS**

No contaminants were found to exceed Table 8 SCS.

**B. The contaminants associated with each of the areas**

A visual representation of the location of the APECs identified can be found on Figure 3B.

**C. Medium that contaminants were identified in**

Contaminants were not identified at concentrations greater than the applicable SCS.

**D. Description and assessment of what is know about each of the areas**

All tests for potential contaminants of concern met the Table 8 SCS.

**E. Distribution in which the areas of each contaminant is present in the area at a concentration greater than the applicable SCS, for each medium in which the contaminant is present, together with figures showing the distribution**

No impacts were identified on the Phase Two Property.

**F. Anything known about the reason for the discharge of the contaminants present on, in or under the Phase Two Property at a concentration greater than the applicable SCS**

No contaminants were found to exceed the Table 8 SCS.

**G. Anything known about migration of the contaminants present on, in or under the phase two property at a concentration greater than the applicable SCS away from any area of potential environmental concern, including the identification of any preferential pathways**

No contaminants were found to exceed the Table 8 SCS.

**H. Climatic or meteorological conditions that may have influenced distribution and migration of the contaminants, such as temporal fluctuations in groundwater levels**

Two groundwater level measurements were recorded throughout the course of this investigation. The ground water level is high in spring and low in summer. The ground water levels were found to fluctuate by a maximum of 80 cm between January 3, 2019 and January 7, 2019. Shallow ground water levels typically exhibit seasonal fluctuations. Ground water monitoring is ongoing by hydrogeological investigation. The soil and ground water at the Property meets the SCS and includes no migration of the contamination.

**I. Information concerning soil vapour intrusion of the contaminants into buildings**

No volatile parameters were identified at concentrations greater than the applicable SCS, therefore vapour intrusion is not considered to be an exposure pathway at this time.

- **Where contaminants on, in or under the Phase Two Property are present at concentrations greater than the applicable SCS, one or more cross-sections showing**
  - **A. The lateral and vertical distribution of a contaminant in each area where the contaminants are present at concentrations greater than the applicable SCS in soil, groundwater and sediment**
  - **B. Approximate depth to water table**
  - **C. Stratigraphy from ground surface to the deepest aquifer or aquitard investigated**
  - **D. Any subsurface structures and utilities that may affect contaminants distribution and transport**

Cross-sections depicting this content have been prepared, refer to Figures 8A through 8B.

- **For each area where a contaminant is present on, in or under the property at a concentration greater than the applicable SCS for the contaminant, a diagram identifying, with narrative explanatory notes**
  - **A. The release mechanisms**
  - **B. Contaminant transport pathway**
  - **C. The human and ecological receptors located on, in or under the phase two property**
  - **D. Receptor exposure points**
  - **E. Routes of exposure**

# 7.0 Conclusions

This Phase Two ESA involved that advancement of nine (9) boreholes, the installation of seven (7) monitoring wells on the Phase One Property, and the collection of soil and groundwater samples for analysis of the potential contaminants of concern, including: Petroleum Hydrocarbons (PHCs), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), Metals and Other Registered Parameters (ORPs), and Organochlorine Pesticides (OCPs).

Based on the results of the information gathered through the course of the investigation, DS presents the following conclusions:

- The stratigraphy beneath the investigated areas of the Property generally consisted of fill to depths of 0.8 to 1.9m below grade. The fill was comprised of clayey silt, trace rootlets, and trace topsoil. Native soil consisting of clayey silt to sandy silt till was found in all of the boreholes below the fill material, extending to a clayey silt till/shale complex or the shale bedrock. Shale bedrock of Queenston Formation was encountered at most borehole locations, below depths ranging from 1.5 to 6.1m, corresponding to Elevations 135.6 to 138.3 metres above sea level (masl).
- A total of nineteen (19) soil samples from borehole locations, including one quality control (QC) duplicate were submitted for chemical analysis of PHCs (F1-F4), BTEX, VOCs, PAHs), OCPs and metals and ORPs.
- The result of chemical analyses for soil revealed no exceedances of the applicable site condition Standards (Table 8) for parameters analyzed. All the samples met the MECP Table 8 SCS.
- A total of thirteen (13) ground water samples including a QC from the installed 7 monitoring wells on the Property were analysed for PHCs (F1-F4), BTEX, VOCs, PAHs), OCPs and metals and ORPs.
- No exceedances of the applicable Standards for parameters analyzed were found in any of the ground water samples analyzed. All other ground water samples met the MECP Table 8 SCS.
- According to the Certificate of Analysis, the pH of the soil and ground water samples was within the acceptable values of the MECP Guideline ( 5 to 9).
- All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required.

It is the opinion of the $QP_{ESA}$ that the applicable SCS for the soil and groundwater at the Phase Two Property have been met as of the Certification Date of January 2, 2019. No further sub-surface investigation is required regarding the environmental quality of the soil and groundwater at the Phase Two Property.

## 7.1 Qualifications of the Assessors

**Shafi Andseta, Ph.D., P.Geo., $QP_{ESA-RA}$**

Dr. Andseta is Senior Project Manager in the Environmental Services Department of DS Consultants Inc.'s Head Office located in Vaughan, Ontario. Dr. Andseta has over 25 years of experience in the academic, private and government sectors. Her areas of expertise include environmental site assessments, geology, remediation, brownfields redevelopment and hydrogeology. She also specializes in remediation and designated substances and hazardous material and asbestos management projects. Dr. Andseta has managed numerous environmental projects within Ontario and, in addition, has coordinated Environmental Projects of the Post-Graduate Diploma students at Sheridan College, Brampton, Ontario. Dr. Andseta is a Qualified Person under O.Reg. 153/04 for submitting Records of Site Condition and submitting of Risk Assessment.

**Patrick (Rick) Fioravanti, B.Sc., P.Geo., $QP_{ESA}$**

Mr. Fioravanti an Environmental Project Manager with DS Consultants Limited. Patrick holds an Honours Bachelor of Science with distinction in Toxicology from the University of Guelph and is a practicing member of the Association of Professional Geoscientists of Ontario (APGO). Patrick has over seven years of environmental consulting experience and has conducted and/or managed over 100 projects in his professional experience. Patrick has extensive experience conducting Phase One and Phase Two Environmental Site Assessments in support of brownfields redevelopment in urban settings, and been involved in numerous remediation projects, supported many risk assessments, and successfully filed Records of Site Condition with the Ministry of Environment. He has conducted work across southern and eastern Ontario, and Quebec in his professional experience. Patrick is considered a Qualified Person to conduct Environmental Site Assessments as defined by Ontario Regulation 153/04 (as amended).

**Aphrodite Koseos, B.Sc., EPt.**

Ms. Koseos is an Environmental Technician with DS Consultants Ltd. Aphrodite holds a Bachelor of Science Degree from Simon Fraser University with a major in Environmental Science and a specialization in Earth Systems. Aphrodite is also registered as an environmental professional in training with ECO Canada. Aphrodite has had several years of experience in the environmental sector conducting Phase One and Phase Two Environmental Site Assessments.

## 7.2 Signatures

This Phase Two ESA was conducted under the supervision of Shafi Andseta, Ph.D., P.Geo., $QP_{ESA-RA}$ in accordance with the requirements of O.Reg. 153/04 (as amended). The findings and conclusions presented have been determined based on the information obtained at the time of the investigation, and on an assessment of the conditions of the Site at this time.

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

**DS Consultants Ltd.**

**Aphrodite Koseos, B.Sc., EPt.**
Environmental Technician

**Shafi Andseta, Ph.D., P.Geo., $QP_{ESA-RA}$**
Environmental Project Manager

**Patrick Fioravanti, B.Sc., P.Geo., $QP_{ESA}$**
Environmental Project Manager



## 7.3 Limitations

This report was prepared for the sole use of Millcroft Greens Corporation and is intended to provide an assessment of the environmental condition on the property located at 2155 Country Club Drive, Areas A & B, Burlington, Ontario. The information presented in this report is based on information collected during the completion of the Phase Two Environmental Site Assessment by DS Consultants Ltd. The material in this report reflects DS' judgment in light of the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this documents or findings, conclusions and recommendations represented herein, is at the sole risk of said users.

The conclusions drawn from the Phase Two ESA were based on information at selected observation and sampling locations. Conditions between and beyond these locations may become apparent during future investigations or on-site work, which could not be detected or anticipated at the time of this investigation. The sampling locations were chosen based upon a cursory historical search, visual observations and limited information provided by persons knowledgeable about past and current activities on this site during the Phase Two ESA activities. As such, DS Consultants Ltd. cannot be held responsible for environmental conditions at the site that was not apparent from the available information.

# 8.0 References


- Armstrong, D.K. and Dodge, J.E.P. *Paleozoic Geology Map of Southern Ontario*. Ontario Geological Survey, Miscellaneous Release--Data 219.
- Chapman, L.J. and Putnam, D.F. 2007. *The Physiography of Southern Ontario*. Ontario Geological Survey, Miscellaneous Release--Data 228.
- Freeze, R. Allen and Cherry, John A., 1979. *Ground water*. Page 29.
- Ontario Ministry of the Environment, December 1996. *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario.*
- Ontario Ministry of Environment, 15 April 2011. *Soil, Ground Water and Sediment Standards for use under part XV.1of the Environmental Protection Act.*
- Ontario Ministry of the Environment, June 2011. *Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04.*
- Ontario Ministry of the Environment, July 2011. *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.*
- The Ontario Geological Survey. 2003. *Surficial Geology of Southern Ontario*.
- Phase One Environmental Site Assessment, 2155 Country Club Drive, Burlington, Ontario, dated November 1, 2018, prepared for Argo Development Corporation.
- Geotechnical Investigation, Proposed Residential Subdivision, 2155 Country Club Drive, Burlington, Ontario, dated January 21, 2019, prepared for Argo Development Corporation

# Tables

**Table 1: Summary of Monitoring Well Installation and Groundwater Data**

| Well ID | | | BH18-1 | BH18-2 | BH18-4 | BH18-5 | BH18-6 | BH18-7 | BH18-9 |
|---|---|---|---|---|---|---|---|---|---|
| Installed By: | | | DS | DS | DS | DS | DS | DS | DS |
| Installation Date: | | | December 18, 2018 | December 18, 2018 | December 19, 2018 | December 19, 2018 | December 19, 2018 | December 20, 2018 | December 20, 2018 |
| Well Status: | | | Active | Active | Active | Active | Active | Active | Active |
| Inner Diameter | | (mm) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Surface Elevation | | (masl) | 142.78 | 142.17 | 140.58 | 140.16 | 138.10 | 138.57 | 140.80 |
| Bottom of Concrete Seal/Top of Bentonite Seal | | mbgs | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| | | masl | 142.48 | 141.87 | 140.28 | 139.86 | 137.80 | 138.27 | 140.50 |
| Bottom of Bentonite Seal/Top of Sand Pack | | mbgs | 2.40 | 2.40 | 2.10 | 0.90 | 0.50 | 1.20 | 1.70 |
| | | masl | 140.38 | 139.77 | 138.48 | 139.26 | 137.60 | 137.37 | 139.10 |
| Top of Well Screen | | mbgs | 3.10 | 3.10 | 2.70 | 1.50 | 0.80 | 1.50 | 2.30 |
| | | masl | 139.68 | 139.07 | 137.88 | 138.66 | 137.30 | 137.07 | 138.50 |
| Well Screen Length | | m | 3.10 | 1.50 | 1.60 | 3.10 | 1.50 | 3.10 | 1.50 |
| Bottom of Well Screen | | mbgs | 6.10 | 4.60 | 4.30 | 4.60 | 2.30 | 4.60 | 3.80 |
| | | masl | 136.68 | 137.57 | 135.98 | 135.26 | 135.50 | 133.67 | 136.70 |
| **GW Monitoring** | | | | | | | | | |
| 03-Jan-19 | Depth to GW | mbgs | 4.16 | 1.04 | 1.76 | 2.62 | 1.49 | 2.06 | 1.74 |
| | GW Elevation | masl | 138.62 | 141.13 | 138.82 | 137.54 | 136.61 | 136.51 | 139.06 |
| 07-Jan-19 | Depth to GW | mbgs | 4.27 | 1.36 | 2.07 | 3.44 | 1.60 | 2.40 | 1.95 |
| | GW Elevation | masl | 138.51 | 140.81 | 138.51 | 136.72 | 136.50 | 136.17 | 138.85 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 2: Summary of Soil Samples Submitted for Chemical Analysis**

| Borehole ID | Sample No. | Sample Depth (mbgs) | Soil Description | Parameter Analyzed | APEC Investigated |
|---|---|---|---|---|---|
| BH18-1 | SS2 | 0.76-1.37 | Fill: clayey silt, trace rootlets | Metals and ORPs | APEC1, APEC-2 |
| | SS3 | 1.52-2.13 | Fill: clayey silt, trace rootlets<br><br>Clayey silt till: sandy, trace gravel/cobble | OC Pesticides | APEC1, APEC-2 |
| | SS6 | 4.57-5.18 | Till shale complex | PHCs | APEC1, APEC-2 |
| BH18-2 | SS2 | 0.76-1.52 | Fill: clayey silt, trace topsoil | OC Pesticides | APEC1, APEC-2 |
| | SS3 | 1.52-2.13 | Clayey silt till: sandy, trace gravel/cobble | Metals, ORPs | APEC1, APEC-2 |
| BH18-3 | SS1 | 0.00-0.60 | Topsoil<br><br>Fill: clayey silt, trace topsoil | OC Pesticides | APEC1, APEC-2 |
| | SS2 | 0.76-1.37 | Fill: clayey silt, trace topsoil | Metals and ORPs | APEC1, APEC-2 |
| BH18-4 | SS2 | 0.76-1.37 | Fill: clayey silt, trace rootlets | PAHs | APEC1, APEC-2, APEC-3 |
| BH18-5 | SS1 | 0.00-0.60 | Topsoil<br><br>Fill: clayey silt, trace topsoil | Metals and ORPs, PAHs | APEC1, APEC-2, APEC-3 |
| BH18-6 | SS1 | 0.00-0.60 | Topsoil<br><br>Fill: clayey silt | PAHs | APEC1, APEC-2 |
| | SS2 | 0.76-1.37 | Clayey silt till:trace sand, trace gravel/cobble, trace shale fragments | Metals and ORPs | APEC1, APEC-2 |
| | SS3 | 1.52-2.13 | Shale bedrock: Highly weathered shale | OC Pesticides | APEC1, APEC-2 |
| BH18-7 | SS4 | 2.29-2.90 | Shale bedrock: Highly weathered shale | PHCs | APEC1, APEC-2 |
| BH18-8 | SS2 | 0.76-1.37 | Fill: clayey silt, trace rootlet/topsoil, trace organics | OC Pesticides | APEC1, APEC-2 |
| BH18-9 | SS3 | 1.52-2.13 | Fill: clayey silt, trace rootlet/topsoil, trace organics<br><br>Sandy Silt Till: trace clay, trace gravel/cobble | PHCs | APEC1, APEC-2 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 3: Summary of Groundwater Samples Submitted for Chemical Analysis**

| Well ID | Well Screen Interval (masl) | | | Sample Date | Parameter Analyzed | APEC Investigated |
|---|---|---|---|---|---|---|
| BH18-1 | 136.7 | - | 139.7 | January 7, 2019 | Metals, ORPs, PHCs, VOCs | APEC-1, APEC-2 |
| BH18-2 | 137.6 | - | 139.1 | January 7, 2019 | Metals, ORPs, OCPs | APEC-1, APEC-2 |
| BH18-4 | 136.0 | - | 137.9 | January 7, 2019 | Metals, ORPs, PAHs | APEC-1, APEC-2, APEC-3 |
| BH18-5 | 135.3 | - | 138.7 | January 7, 2019 | PAHs, OCPs | APEC-1, APEC-2, APEC-3 |
| BH18-6 | 135.5 | - | 137.3 | January 7, 2019 | Metals, ORPs, PAHs, OCPs | APEC-1, APEC-2 |
| BH18-7 | 133.7 | - | 137.1 | January 7, 2019 | Metals, ORPs, PHCs, VOCs | APEC-2 |
| BH18-9 | 136.7 | - | 138.5 | January 7, 2019 | Metals, ORPs, PHCs, VOCs | APEC-2 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 4: Summary of APECs Investigated**

| APEC | Description | PCOCs | Media | Boreholes Within APEC | Samples Analysed | Parameter Analyzed |
|---|---|---|---|---|---|---|
| APEC-1 | PCA 40: Pesticides (including Herbicides, Fungicides, and Ant-Fouling Agents) Manufacturing, Processing, Bulk Storage, and Large-Scale Applications | OC Pesticides | Soil | BH18-1 | SS3 | OC Pesticides |
| | | | | BH18-2 | SS2 | OC Pesticides |
| | | | | BH18-3 | SS1 | OC Pesticides |
| | | | | BH18-6 | SS3 | OC Pesticides |
| | | | | BH18-8 | SS2 | OC Pesticides |
| | | | Groundwater | BH18-2 | BH18-2 | OC Pesticides |
| | | | | BH18-5 | BH18-5 | OC Pesticides |
| | | | | BH18-6 | BH18-6 | OC Pesticides |
| APEC-2 | PCA 30: Importation of Fill Materail of Unknown Quality | Metals, ORPs, PAHs, PHCs, VOCs | Soil | BH18-1 | SS2 | Metals, ORPs |
| | | | | | SS6 | PHCs |
| | | | | BH18-2 | SS3 | Metals, ORPs |
| | | | | BH18-3 | SS2 | Metals, ORPs |
| | | | | BH18-4 | SS2 | PAHs |
| | | | | BH18-5 | SS1 | Metals, ORPs, PAHs |
| | | | | BH18-6 | SS1 | PHCs |
| | | | | | SS2 | Metals, ORPs |
| | | | | BH18-7 | SS4 | PHCs |
| | | | | BH18-9 | SS3 | PHCs |
| | | | Groundwater | BH18-1 | BH18-1 | Metals, ORPs, PHCs, VOCs |
| | | | | BH18-2 | BH18-2 | Metals, ORPs |
| | | | | BH18-4 | BH18-4 | Metals, ORPs, PAHs |
| | | | | BH18-5 | BH18-5 | PAHs |
| | | | | BH18-6 | BH18-6 | Metals, ORPs, PAHs |
| | | | | BH18-7 | BH18-7 | Metals, ORPs, PHCs, VOCs |
| | | | | BH18-9 | BH18-9 | Metals, ORPs, PHCs, VOCs |
| APEC-3 | PCA 46: Rail Yards, Tracks and Spurs | Metals, ORPs, PAHs | Soil | BH18-4 | SS2 | PAHs |
| | | | | BH18-5 | SS1 | Metals, ORPs, PAHs |
| | | | Water | BH18-4 | BH18-4 | Metals, ORPs, PAHs |
| | | | | BH18-5 | BH18-5 | Metals, ORPs |

**Table 5: Summary of Metals and ORPs in Soil**

| Parameter | MECP Table 8 SCS | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 (BH18-1 SS2) |
|---|---|---|---|---|---|---|---|
| Date of Collection | | December 18, 2018 | December 18, 2018 | December 18, 2018 | December 19, 2018 | December 19, 2018 | December 18, 2018 |
| Date Reported | | January 3, 2019 | January 3, 2019 | January 3, 2019 | January 3, 2019 | January 3, 2019 | January 3, 2019 |
| Sampling Depth (mbgs) | | 0.76-1.37 | 1.52-2.13 | 0.76-1.37 | 0.00-0.60 | 0.76-1.37 | 0.76-1.37 |
| Analytical Report Reference No. | | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 |
| Antimony (Sb) | 1.3 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Arsenic (As) | 18 | 7.1 | 5.2 | 5.9 | 4.9 | 4.2 | 5 |
| Barium (Ba) | 220 | 78.9 | 132 | 140 | 101 | 66.3 | 86.8 |
| Beryllium (Be) | 2.5 | 0.63 | 0.69 | 0.66 | 0.71 | 0.52 | 0.63 |
| Boron (B), Hot Water Ext. | 1.5 | <0.10 | 0.15 | <0.10 | 0.32 | 0.19 | <0.10 |
| Boron (B) | 36 | 11.3 | 10.8 | 10.8 | 5 | 14.9 | 11.1 |
| Cadmium (Cd) | 1.2 | <0.50 | <0.50 | <0.50 | 0.95 | <0.50 | <0.50 |
| Chromium (Cr) | 70 | 20.9 | 22.5 | 22.1 | 24.8 | 16.1 | 20 |
| Cobalt (Co) | 22 | 11.5 | 11.6 | 12.2 | 10.4 | 10 | 11.1 |
| Copper (Cu) | 92 | 24.8 | 28.9 | 27.6 | 27.7 | 15.1 | 24.3 |
| Lead (Pb) | 120 | 11.9 | 12.2 | 12.4 | 21.6 | 10 | 12.2 |
| Mercury (Hg) | 0.27 | 0.0165 | 0.0189 | 0.0177 | 0.0633 | 0.007 | 0.0148 |
| Molybdenum (Mo) | 2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Nickel (Ni) | 82 | 24.8 | 25.4 | 26.3 | 19.9 | 20.1 | 24.6 |
| Selenium (Se) | 1.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Silver (Ag) | 0.5 | <0.20 | <0.20 | <0.20 | 0.24 | <0.20 | <0.20 |
| Thallium (Tl) | 1 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Uranium (U) | 2.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Vanadium (V) | 86 | 29.6 | 30.7 | 32.2 | 33 | 21.9 | 28.7 |
| Zinc (Zn) | 290 | 54.8 | 60.2 | 59.3 | 95.3 | 43.9 | 54.8 |
| Chromium, Hexavalent | 0.66 | <0.20 | <0.20 | 0.25 | <0.20 | <0.20 | <0.20 |
| SAR | 5 | 0.3 | 0.52 | 0.15 | 0.12 | 0.22 | 0.26 |
| Cyanide, Weak Acid Diss | 0.051 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Conductivity | 0.7 | 0.164 | 0.267 | 0.148 | 0.216 | 0.113 | 0.168 |
| pH | - | 7.81 | 7.81 | 7.76 | 7.4 | 7.9 | 7.8 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 6: Summary of PHCs in Soil**

| Parameter | MECP Table 8 SCS | BH18-1 SS6 | BH18-7 SS4 | BH18-9 SS3 |
|---|---|---|---|---|
| Date of Collection | | December 18, 2018 | December 20, 2018 | December 20, 2018 |
| Date Reported | | January 3, 2019 | January 3, 2019 | January 3, 2019 |
| Sampling Depth (mbgs) | | 4.57-5.18 | 2.29-2.90 | 1.52-2.13 |
| Analytical Report Reference No. | | L2213801-1 | L2213801-2 | L2213801-3 |
| Benzene | 0.02 | <0.0068 | <0.0068 | <0.0068 |
| Ethylbenzene | 0.05 | <0.018 | <0.018 | <0.018 |
| Toluene | 0.2 | <0.080 | <0.080 | <0.080 |
| Xylenes (Total) | 0.05 | <0.050 | <0.050 | <0.050 |
| F1 (C6-C10) | 25 | <5.0 | <5.0 | <5.0 |
| F1-BTEX | 25 | <5.0 | <5.0 | <5.0 |
| F2 (C10-C16) | 10 | <10 | <10 | <10 |
| F3 (C16-C34) | 240 | <50 | <50 | <50 |
| F4 (C34-C50) | 120 | <50 | <50 | <50 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 7: Summary of PAHs in Soil**

| Parameter | MECP Table 8 SCS | BH18-6 SS1 | BH18-5 SS1 | BH18-4 SS2 | DUP3 (BH18-6 SS1) |
|---|---|---|---|---|---|
| Date of Collection | | December 19, 2018 | December 19, 2018 | December 19, 2018 | December 18, 2018 |
| Date Reported | | January 3, 2019 | January 3, 2019 | January 3, 2019 | January 3, 2019 |
| Screen Interval (mbgs) | | 0.00-0.60 | 0.00-0.60 | 0.76-1.37 | 0.00-0.60 |
| Analytical Report Reference No. | | L2213801-4 | L2213801-5 | L2213801-6 | L2213801-7 |
| Acenaphthene | 0.072 | <0.050 | <0.050 | <0.050 | <0.050 |
| Acenaphthylene | 0.093 | <0.050 | <0.050 | <0.050 | <0.050 |
| Anthracene | 0.22 | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(a)anthracene | 0.36 | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(a)pyrene | 0.3 | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(b)fluoranthene | 0.47 | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(g,h,i)perylene | 0.68 | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(k)fluoranthene | 0.48 | <0.050 | <0.050 | <0.050 | <0.050 |
| Chrysene | 2.8 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dibenzo(ah)anthracene | 0.1 | <0.050 | <0.050 | <0.050 | <0.050 |
| Fluoranthene | 0.69 | <0.050 | <0.050 | <0.050 | <0.050 |
| Fluorene | 0.19 | <0.050 | <0.050 | <0.050 | <0.050 |
| Indeno(1,2,3-cd)pyrene | 0.23 | <0.050 | <0.050 | <0.050 | <0.050 |
| 1+2-Methylnaphthalenes | 0.59 | <0.042 | <0.042 | <0.042 | <0.042 |
| 1-Methylnaphthalene | 0.59 | <0.030 | <0.030 | <0.030 | <0.030 |
| 2-Methylnaphthalene | 0.59 | <0.030 | <0.030 | <0.030 | <0.030 |
| Naphthalene | 0.09 | <0.013 | <0.013 | <0.013 | <0.013 |
| Phenanthrene | 0.69 | <0.046 | <0.046 | <0.046 | <0.046 |
| Pyrene | 1 | <0.050 | <0.050 | <0.050 | <0.050 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 8: Summary of Organochlorine Pesticides (OCPs) in Soil**

| Parameter | MECP Table 8 SCS | BH18-1 SS3 | BH18-2 SS2 | BH18-3 SS1 | BH18-6 SS3 | BH18-8 SS2 | DUP2 (BH18-8 SS2) |
|---|---|---|---|---|---|---|---|
| Date of Collection | | December 18, 2018 | December 18, 2018 | December 18, 2018 | December 19, 2018 | December 20, 2018 | December 18, 2018 |
| Date Reported | | January 3, 2019 | January 4, 2019 | January 5, 2019 | January 6, 2019 | January 7, 2019 | January 8, 2019 |
| Screen Interval (mbgs) | | 1.52-2.13 | 0.76-1.37 | 0.00-0.60 | 1.52-2.13 | 0.76-1.37 | 0.76-1.37 |
| Analytical Report Reference No. | | L2213807-6 | L2213807-7 | L2213807-8 | L2213807-9 | L2213807-10 | L2213807-12 |
| Aldrin | 0.05 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| gamma-hexachlorocyclohexane | 0.01 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Chlordane (Total) | 0.05 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Total DDD | 0.05 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Total DDE | 0.05 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Total DDT | 1.4 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Dieldrin | 0.05 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Endosulfan (Total) | 0.04 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Endrin | 0.04 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Heptachlor | 0.05 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Heptachlor Epoxide | 0.05 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Hexachlorobenzene | 0.02 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobutadiene | 0.01 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachloroethane | 0.01 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Methoxychlor | 0.05 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 9: Summary of Metals and ORPs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-1 | BH18-2 | BH18-4 | BH18-6 |
|---|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 3.1-6.1 | 3.1-4.6 | 2.7-4.3 | 0.8-2.3 |
| Analytical Report Reference No. | | | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 |
| Antimony (Sb)-Dissolved | 6 | ug/L | 0.33 | 0.13 | 0.17 | 0.16 |
| Arsenic (As)-Dissolved | 25 | ug/L | 3.6 | 0.61 | 0.55 | 0.79 |
| Barium (Ba)-Dissolved | 1000 | ug/L | 76 | 67.3 | 108 | 74.1 |
| Beryllium (Be)-Dissolved | 4 | ug/L | <0.10 | <0.10 | <0.10 | <0.10 |
| Boron (B)-Dissolved | 5000 | ug/L | 265 | 115 | 134 | 135 |
| Cadmium (Cd)-Dissolved | 2.1 | ug/L | 0.011 | <0.010 | <0.010 | <0.010 |
| Chromium (Cr)-Dissolved | 50 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Cobalt (Co)-Dissolved | 3.8 | ug/L | 0.24 | 0.12 | 0.19 | <0.10 |
| Copper (Cu)-Dissolved | 69 | ug/L | 1.14 | 0.41 | 0.45 | 0.76 |
| Lead (Pb)-Dissolved | 10 | ug/L | 0.139 | <0.050 | <0.050 | <0.050 |
| Mercury (Hg)-Dissolved | 0.29 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Molybdenum (Mo)-Dissolved | 70 | ug/L | 22.7 | 6.03 | 6.72 | 4.7 |
| Nickel (Ni)-Dissolved | 100 | ug/L | 1.56 | 0.85 | 0.86 | 0.54 |
| Selenium (Se)-Dissolved | 10 | ug/L | 0.285 | 0.693 | 0.088 | 0.111 |
| Silver (Ag)-Dissolved | 1.2 | ug/L | <0.050 | <0.050 | <0.050 | <0.050 |
| Sodium (Na)-Dissolved | 490000 | ug/L | 29000 | 17600 | 44900 | 14100 |
| Thallium (Tl)-Dissolved | 2 | ug/L | 0.027 | 0.016 | 0.025 | 0.013 |
| Uranium (U)-Dissolved | 20 | ug/L | 7.77 | 4.86 | 2.14 | 2.51 |
| Vanadium (V)-Dissolved | 6.2 | ug/L | 2.12 | 0.63 | 0.81 | 1.02 |
| Zinc (Zn)-Dissolved | 890 | ug/L | 6.6 | <1.0 | <1.0 | <1.0 |
| Chromium, Hexavalent | 25 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Cyanide, Weak Acid Diss | 52 | ug/L | <2.0 | <2.0 | <2.0 | <2.0 |
| Chloride (Cl) | 790 | mg/L | 37.8 | 7.79 | 132 | 28.6 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 9: Summary of Metals and ORPs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-7 | BH18-9 | DUP3 (BH18-7) |
|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 1.5-4.6 | 2.3-3.8 | 1.5-4.6 |
| Analytical Report Reference No. | | | L2217334-6 | L2217334-7 | L2217334-10 |
| Antimony (Sb)-Dissolved | 6 | ug/L | 0.22 | 0.21 | 0.2 |
| Arsenic (As)-Dissolved | 25 | ug/L | 1.38 | 1.07 | 1.48 |
| Barium (Ba)-Dissolved | 1000 | ug/L | 93.3 | 91.1 | 93.6 |
| Beryllium (Be)-Dissolved | 4 | ug/L | <0.10 | <0.10 | <0.10 |
| Boron (B)-Dissolved | 5000 | ug/L | 500 | 175 | 494 |
| Cadmium (Cd)-Dissolved | 2.1 | ug/L | <0.010 | <0.010 | <0.010 |
| Chromium (Cr)-Dissolved | 50 | ug/L | <0.50 | <0.50 | <0.50 |
| Cobalt (Co)-Dissolved | 3.8 | ug/L | 0.43 | 0.23 | 0.45 |
| Copper (Cu)-Dissolved | 69 | ug/L | 0.96 | 1.11 | 1 |
| Lead (Pb)-Dissolved | 10 | ug/L | <0.050 | <0.050 | <0.050 |
| Mercury (Hg)-Dissolved | 0.29 | ug/L | <0.010 | <0.010 | <0.010 |
| Molybdenum (Mo)-Dissolved | 70 | ug/L | 7.84 | 9.51 | 7.73 |
| Nickel (Ni)-Dissolved | 100 | ug/L | 1.41 | 1.22 | 1.5 |
| Selenium (Se)-Dissolved | 10 | ug/L | 0.241 | 0.163 | 0.229 |
| Silver (Ag)-Dissolved | 1.2 | ug/L | <0.050 | <0.050 | <0.050 |
| Sodium (Na)-Dissolved | 490000 | ug/L | 41800 | 38300 | 41300 |
| Thallium (Tl)-Dissolved | 2 | ug/L | 0.016 | 0.028 | 0.016 |
| Uranium (U)-Dissolved | 20 | ug/L | 11.3 | 3.26 | 11.3 |
| Vanadium (V)-Dissolved | 6.2 | ug/L | 1.19 | 1.13 | 1.24 |
| Zinc (Zn)-Dissolved | 890 | ug/L | <1.0 | <1.0 | <1.0 |
| Chromium, Hexavalent | 25 | ug/L | <0.50 | <0.50 | <0.50 |
| Cyanide, Weak Acid Diss | 52 | ug/L | <2.0 | <2.0 | <2.0 |
| Chloride (Cl) | 790 | mg/L | 129 | 87.1 | 130 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 10: Summary of PHCs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-1 | BH18-7 | BH18-9 | DUP4 (BH18-9) |
|---|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 3.1-6.1 | 1.5-4.6 | 2.3-3.8 | 2.3-3.8 |
| Analytical Report Reference No. | | | L2217334-1 | L2217334-6 | L2217334-7 | L2217334-11 |
| F1 (C6-C10) | 420 | ug/L | <25 | <25 | <25 | <25 |
| F1-BTEX | 420 | ug/L | <25 | <25 | <25 | <25 |
| F2 (C10-C16) | 150 | ug/L | <100 | <100 | <100 | <100 |
| F3 (C16-C34) | 500 | ug/L | <250 | <250 | <250 | <250 |
| F4 (C34-C50) | 500 | ug/L | <250 | <250 | <250 | <250 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 11:Summary of VOCs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-1 | BH18-7 | BH18-9 | DUP4 (BH18-9) |
|---|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 3.1-6.1 | 1.5-4.6 | 2.3-3.8 | 2.3-3.8 |
| Analytical Report Reference No. | | | L2217334-1 | L2217334-6 | L2217334-7 | L2217334-11 |
| Acetone | 2700 | ug/L | <30 | <30 | <30 | <30 |
| Benzene | 5 | ug/L | <0.50 | 0.6 | <0.50 | <0.50 |
| Bromodichloromethane | 16 | ug/L | <2.0 | <2.0 | <2.0 | <2.0 |
| Bromoform | 25 | ug/L | <5.0 | <5.0 | <5.0 | <5.0 |
| Bromomethane | 0.89 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Carbon tetrachloride | 0.79 | ug/L | <0.20 | <0.20 | <0.20 | <0.20 |
| Chlorobenzene | 30 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Dibromochloromethane | 25 | ug/L | <2.0 | <2.0 | <2.0 | <2.0 |
| Chloroform | 2.4 | ug/L | <1.0 | <1.0 | <1.0 | <1.0 |
| 1,2-Dibromoethane | 0.2 | ug/L | <0.20 | <0.20 | <0.20 | <0.20 |
| 1,2-Dichlorobenzene | 3 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,3-Dichlorobenzene | 59 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,4-Dichlorobenzene | 1 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Dichlorodifluoromethane | 590 | ug/L | <2.0 | <2.0 | <2.0 | <2.0 |
| 1,1-Dichloroethane | 5 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,2-Dichloroethane | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,1-Dichloroethylene | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| cis-1,2-Dichloroethylene | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| trans-1,2-Dichloroethylene | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Methylene Chloride | 50 | ug/L | <5.0 | <5.0 | <5.0 | <5.0 |
| 1,2-Dichloropropane | 5 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,3-Dichloropropene (cis & trans) | 0.5 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Ethylbenzene | 2.4 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| n-Hexane | 51 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Methyl Ethyl Ketone | 1800 | ug/L | <20 | <20 | <20 | <20 |
| Methyl Isobutyl Ketone | 640 | ug/L | <20 | <20 | <20 | <20 |
| MTBE | 15 | ug/L | <2.0 | <2.0 | <2.0 | <2.0 |
| Styrene | 5.4 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,1,1,2-Tetrachloroethane | 1.1 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,1,2,2-Tetrachloroethane | 1 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Tetrachloroethylene | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Toluene | 22 | ug/L | <0.50 | 0.52 | <0.50 | <0.50 |
| 1,1,1-Trichloroethane | 200 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,1,2-Trichloroethane | 4.7 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Trichloroethylene | 1.6 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Trichlorofluoromethane | 150 | ug/L | <5.0 | <5.0 | <5.0 | <5.0 |
| Vinyl chloride | 0.5 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |
| Xylenes (Total) | 300 | ug/L | <0.50 | <0.50 | <0.50 | <0.50 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 11:Summary of VOCs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | TRIP BLANK |
|---|---|---|---|
| Date of Collection | | | January 7, 2019 |
| Date Reported | | | January 15, 2019 |
| Screen Interval (mbgs) | | | N/A |
| Analytical Report Reference No. | | | L2217334-12 |
| Acetone | 2700 | ug/L | <30 |
| Benzene | 5 | ug/L | <0.50 |
| Bromodichloromethane | 16 | ug/L | <2.0 |
| Bromoform | 25 | ug/L | <5.0 |
| Bromomethane | 0.89 | ug/L | <0.50 |
| Carbon tetrachloride | 0.79 | ug/L | <0.20 |
| Chlorobenzene | 30 | ug/L | <0.50 |
| Dibromochloromethane | 25 | ug/L | <2.0 |
| Chloroform | 2.4 | ug/L | <1.0 |
| 1,2-Dibromoethane | 0.2 | ug/L | <0.20 |
| 1,2-Dichlorobenzene | 3 | ug/L | <0.50 |
| 1,3-Dichlorobenzene | 59 | ug/L | <0.50 |
| 1,4-Dichlorobenzene | 1 | ug/L | <0.50 |
| Dichlorodifluoromethane | 590 | ug/L | <2.0 |
| 1,1-Dichloroethane | 5 | ug/L | <0.50 |
| 1,2-Dichloroethane | 1.6 | ug/L | <0.50 |
| 1,1-Dichloroethylene | 1.6 | ug/L | <0.50 |
| cis-1,2-Dichloroethylene | 1.6 | ug/L | <0.50 |
| trans-1,2-Dichloroethylene | 1.6 | ug/L | <0.50 |
| Methylene Chloride | 50 | ug/L | <5.0 |
| 1,2-Dichloropropane | 5 | ug/L | <0.50 |
| 1,3-Dichloropropene (cis & trans) | 0.5 | ug/L | <0.50 |
| Ethylbenzene | 2.4 | ug/L | <0.50 |
| n-Hexane | 51 | ug/L | <0.50 |
| Methyl Ethyl Ketone | 1800 | ug/L | <20 |
| Methyl Isobutyl Ketone | 640 | ug/L | <20 |
| MTBE | 15 | ug/L | <2.0 |
| Styrene | 5.4 | ug/L | <0.50 |
| 1,1,1,2-Tetrachloroethane | 1.1 | ug/L | <0.50 |
| 1,1,2,2-Tetrachloroethane | 1 | ug/L | <0.50 |
| Tetrachloroethylene | 1.6 | ug/L | <0.50 |
| Toluene | 22 | ug/L | <0.50 |
| 1,1,1-Trichloroethane | 200 | ug/L | <0.50 |
| 1,1,2-Trichloroethane | 4.7 | ug/L | <0.50 |
| Trichloroethylene | 1.6 | ug/L | <0.50 |
| Trichlorofluoromethane | 150 | ug/L | <5.0 |
| Vinyl chloride | 0.5 | ug/L | <0.50 |
| Xylenes (Total) | 300 | ug/L | <0.50 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 12: Summary of PAHs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-4 | BH18-5 | BH18-6 | DUP2 (BH18-4) |
|---|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 2.7-4.3 | 1.5-4.6 | 0.8-2.3 | 2.7-4.3 |
| Analytical Report Reference No. | | | L2217334-3 | L2217334-4 | L2217334-5 | L2217334-9 |
| Acenaphthene | 4.1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Acenaphthylene | 1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Anthracene | 1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(a)anthracene | 1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(a)pyrene | 0.01 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Benzo(b)fluoranthene | 0.1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(g,h,i)perylene | 0.2 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(k)fluoranthene | 0.1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Chrysene | 0.1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Dibenzo(ah)anthracene | 0.2 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Fluoranthene | 0.41 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Fluorene | 120 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Indeno(1,2,3-cd)pyrene | 0.2 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| 1+2-Methylnaphthalenes | 3.2 | ug/L | <0.028 | <0.028 | <0.028 | <0.028 |
| 1-Methylnaphthalene | 3.2 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| 2-Methylnaphthalene | 3.2 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |
| Naphthalene | 11 | ug/L | <0.050 | <0.050 | <0.050 | <0.050 |
| Phenanthrene | 1 | ug/L | <0.020 | <0.020 | 0.029 | <0.020 |
| Pyrene | 4.1 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 13: Summary of OCPs in Groundwater**

| Parameter | MECP Table 8 SCS | Units | BH18-2 | BH18-5 | BH18-6 | DUP1 (BH18-2) |
|---|---|---|---|---|---|---|
| Date of Collection | | | January 7, 2019 | January 7, 2019 | January 7, 2019 | January 7, 2019 |
| Date Reported | | | January 15, 2019 | January 15, 2019 | January 15, 2019 | January 15, 2019 |
| Screen Interval (mbgs) | | | 3.1-4.6 | 1.5-4.6 | 0.8-2.3 | 3.1-4.6 |
| Analytical Report Reference No. | | | L2217334-2 | L2217334-4 | L2217334-5 | L2217334-8 |
| Aldrin | 0.35 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| gamma-hexachlorocyclohexane | 0.95 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Chlordane (Total) | 0.06 | ug/L | <0.057 | <0.057 | <0.057 | <0.057 |
| Total DDD | 1.8 | ug/L | <0.042 | <0.042 | <0.042 | <0.042 |
| Total DDE | 10 | ug/L | <0.011 | <0.011 | <0.011 | <0.011 |
| Total DDT | 0.05 | ug/L | <0.042 | <0.042 | <0.042 | <0.042 |
| Dieldrin | 0.35 | ug/L | <0.050 | <0.050 | <0.050 | <0.050 |
| Endosulfan (Total) | 0.56 | ug/L | <0.042 | <0.042 | <0.042 | <0.042 |
| Endrin | 0.36 | ug/L | <0.040 | <0.040 | <0.040 | <0.040 |
| Heptachlor | 0.038 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Heptachlor Epoxide | 0.038 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobenzene | 1 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobutadiene | 0.44 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachloroethane | 2.1 | ug/L | <0.010 | <0.010 | <0.010 | <0.010 |
| Methoxychlor | 0.3 | ug/L | <0.050 | <0.050 | <0.050 | <0.050 |

For Table Notes see **Notes for Soil and Groundwater Summary Tables,** included at the end of this Section

**Table 14: Summary of Maximum Concentrations in Soil**

| | Parameter | Standard | Maximum Concentration | Location |
|---|---|---|---|---|
| Metals and ORPs | Antimony (Sb) | 1.3 | <1.0 | All Samples |
| | Arsenic (As) | 18 | 7.1 | BH18-1 SS2 |
| | Barium (Ba) | 220 | 140 | BH18-3 SS2 |
| | Beryllium (Be) | 2.5 | 0.71 | BH18-5 SS1 |
| | Boron (B), Hot Water Ext. | 1.5 | 0.32 | BH18-5 SS1 |
| | Boron (B) | 36 | 14.9 | BH18-6 SS2 |
| | Cadmium (Cd) | 1.2 | 0.95 | BH18-5 SS1 |
| | Chromium (Cr) | 70 | 24.8 | BH18-5 SS1 |
| | Cobalt (Co) | 22 | 12.2 | BH18-3 SS2 |
| | Copper (Cu) | 92 | 28.9 | BH18-2 SS3 |
| | Lead (Pb) | 120 | 21.6 | BH18-5 SS1 |
| | Mercury (Hg) | 0.27 | 0.0633 | BH18-5 SS1 |
| | Molybdenum (Mo) | 2 | <1.0 | All Samples |
| | Nickel (Ni) | 82 | 26.3 | BH18-3 SS2 |
| | Selenium (Se) | 1.5 | <1.0 | All Samples |
| | Silver (Ag) | 0.5 | 0.24 | BH18-5 SS1 |
| | Thallium (Tl) | 1 | <0.50 | All Samples |
| | Uranium (U) | 2.5 | <1.0 | All Samples |
| | Vanadium (V) | 86 | 33 | BH18-5 SS1 |
| | Zinc (Zn) | 290 | 95.3 | BH18-5 SS1 |
| | Chromium, Hexavalent | 0.66 | 0.25 | BH18-3 SS2 |
| | SAR | 5 | 0.52 | BH18-2 SS3 |
| | Cyanide, Weak Acid Diss | 0.051 | <0.050 | All Samples |
| | Conductivity | 0.7 | 0.267 | BH18-2 SS3 |
| PHCs | Benzene | - | 7.9 | BH18-6 SS2 |
| | Ethylbenzene | 0.02 | <0.0068 | All Samples |
| | Toluene | 0.05 | <0.018 | All Samples |
| | Xylenes (Total) | #REF! | #REF! | #REF! |
| | F1 (C6-C10) | #REF! | #REF! | #REF! |
| | F1-BTEX | 25 | <5.0 | All Samples |
| | F2 (C10-C16) | 25 | <5.0 | All Samples |
| | F3 (C16-C34) | 10 | <10 | All Samples |
| | F4 (C34-C50) | 240 | <50 | All Samples |
| PAHs | Acenaphthene | 0.072 | <0.050 | All Samples |
| | Acenaphthylene | 0.093 | <0.050 | All Samples |
| | Anthracene | 0.22 | <0.050 | All Samples |
| | Benzo(a)anthracene | 0.36 | <0.050 | All Samples |
| | Benzo(a)pyrene | 0.3 | <0.050 | All Samples |
| | Benzo(b)fluoranthene | 0.47 | <0.050 | All Samples |
| | Benzo(g,h,i)perylene | 0.68 | <0.050 | All Samples |
| | Benzo(k)fluoranthene | 0.48 | <0.050 | All Samples |
| | Chrysene | 2.8 | <0.050 | All Samples |
| | Dibenzo(ah)anthracene | 0.1 | <0.050 | All Samples |
| | Fluoranthene | 0.69 | <0.050 | All Samples |

**Table 14: Summary of Maximum Concentrations in Soil**

| | Parameter | Standard | Maximum Concentration | Location |
|---|---|---|---|---|
| PAHs | Fluorene | 0.19 | <0.050 | All Samples |
| | Indeno(1,2,3-cd)pyrene | 0.23 | <0.050 | All Samples |
| | 1+2-Methylnaphthalenes | 0.59 | <0.042 | All Samples |
| | 1-Methylnaphthalene | 0.59 | <0.030 | All Samples |
| | 2-Methylnaphthalene | 0.59 | <0.030 | All Samples |
| | Naphthalene | 0.09 | <0.013 | All Samples |
| | Phenanthrene | 0.69 | <0.046 | All Samples |
| | Pyrene | 1 | <0.050 | All Samples |
| OCPs | Aldrin | 0.05 | <0.020 | All Samples |
| | gamma-hexachlorocyclohexane | 0.01 | <0.010 | All Samples |
| | Chlordane (Total) | 0.05 | <0.028 | All Samples |
| | Total DDD | 0.05 | <0.028 | All Samples |
| | Total DDE | 0.05 | <0.028 | All Samples |
| | Total DDT | 1.4 | <0.028 | All Samples |
| | Dieldrin | 0.05 | <0.020 | All Samples |
| | Endosulfan (Total) | 0.04 | <0.028 | All Samples |
| | Endrin | 0.04 | <0.020 | All Samples |
| | Heptachlor | 0.05 | <0.020 | All Samples |
| | Heptachlor Epoxide | 0.05 | <0.020 | All Samples |
| | Hexachlorobenzene | 0.02 | <0.010 | All Samples |
| | Hexachlorobutadiene | 0.01 | <0.010 | All Samples |
| | Hexachloroethane | 0.01 | <0.010 | All Samples |
| | Methoxychlor | 0.05 | <0.020 | All Samples |

**Table 15: Summary of Maximum Concentrations in Groundwater**

| Parameter | | Standard | Maximum Concentration | Location |
|---|---|---|---|---|
| Metals and ORPs | Antimony (Sb)-Dissolved | 6 | 0.33 | BH18-1 |
| | Arsenic (As)-Dissolved | 25 | 3.6 | BH18-1 |
| | Barium (Ba)-Dissolved | 1000 | 108 | BH18-4 |
| | Beryllium (Be)-Dissolved | 4 | <0.10 | All Samples |
| | Boron (B)-Dissolved | 5000 | 500 | BH18-7 |
| | Cadmium (Cd)-Dissolved | 2.1 | 0.011 | BH18-1 |
| | Chromium (Cr)-Dissolved | 50 | <0.50 | All Samples |
| | Cobalt (Co)-Dissolved | 3.8 | 0.45 | DUP3 (BH18-7) |
| | Copper (Cu)-Dissolved | 69 | 1.14 | BH18-1 |
| | Lead (Pb)-Dissolved | 10 | 0.139 | BH18-1 |
| | Mercury (Hg)-Dissolved | 0.29 | <0.010 | All Samples |
| | Molybdenum (Mo)-Dissolved | 70 | 22.7 | BH18-1 |
| | Nickel (Ni)-Dissolved | 100 | 1.56 | BH18-1 |
| | Selenium (Se)-Dissolved | 10 | 0.693 | BH18-2 |
| | Silver (Ag)-Dissolved | 1.2 | <0.050 | All Samples |
| | Sodium (Na)-Dissolved | 490000 | 44900 | BH18-4 |
| | Thallium (Tl)-Dissolved | 2 | 0.028 | BH18-9 |
| | Uranium (U)-Dissolved | 20 | 11.3 | BH18-7 |
| | Vanadium (V)-Dissolved | 6.2 | 2.12 | BH18-1 |
| | Zinc (Zn)-Dissolved | 890 | 6.6 | BH18-1 |
| | Chromium, Hexavalent | 25 | <0.50 | All Samples |
| | Cyanide, Weak Acid Diss | 52 | <2.0 | All Samples |
| | Chloride (Cl) | 790 | 132 | BH18-4 |
| PHCs | F1 (C6-C10) | 420 | <25 | All Samples |
| | F1-BTEX | 420 | <25 | All Samples |
| | F2 (C10-C16) | 150 | <100 | All Samples |
| | F3 (C16-C34) | 500 | <250 | All Samples |
| | F4 (C34-C50) | 500 | <250 | All Samples |
| VOCs | Acetone | 2700 | <30 | All Samples |
| | Benzene | 5 | 0.6 | BH18-7 |
| | Bromodichloromethane | 16 | <2.0 | All Samples |
| | Bromoform | 25 | <5.0 | All Samples |
| | Bromomethane | 0.89 | <0.50 | All Samples |
| | Carbon tetrachloride | 0.79 | <0.20 | All Samples |
| | Chlorobenzene | 30 | <0.50 | All Samples |
| | Dibromochloromethane | 25 | <2.0 | All Samples |
| | Chloroform | 2.4 | <1.0 | All Samples |
| | 1,2-Dibromoethane | 0.2 | <0.20 | All Samples |
| | 1,2-Dichlorobenzene | 3 | <0.50 | All Samples |
| | 1,3-Dichlorobenzene | 59 | <0.50 | All Samples |
| | 1,4-Dichlorobenzene | 1 | <0.50 | All Samples |
| | Dichlorodifluoromethane | 590 | <2.0 | All Samples |
| | 1,1-Dichloroethane | 5 | <0.50 | All Samples |
| | 1,2-Dichloroethane | 1.6 | <0.50 | All Samples |

**Table 15: Summary of Maximum Concentrations in Groundwater**

| | Parameter | Standard | Maximum Concentration | Location |
|---|---|---|---|---|
| VOCs | 1,1-Dichloroethylene | 1.6 | <0.50 | All Samples |
| | cis-1,2-Dichloroethylene | 1.6 | <0.50 | All Samples |
| | trans-1,2-Dichloroethylene | 1.6 | <0.50 | All Samples |
| | Methylene Chloride | 50 | <5.0 | All Samples |
| | 1,2-Dichloropropane | 5 | <0.50 | All Samples |
| | 1,3-Dichloropropene (cis & trans | 0.5 | <0.50 | All Samples |
| | Ethylbenzene | 2.4 | <0.50 | All Samples |
| | n-Hexane | 51 | <0.50 | All Samples |
| | Methyl Ethyl Ketone | 1800 | <20 | All Samples |
| | Methyl Isobutyl Ketone | 640 | <20 | All Samples |
| | MTBE | 15 | <2.0 | All Samples |
| | Styrene | 5.4 | <0.50 | All Samples |
| | 1,1,1,2-Tetrachloroethane | 1.1 | <0.50 | All Samples |
| | 1,1,2,2-Tetrachloroethane | 1 | <0.50 | All Samples |
| | Tetrachloroethylene | 1.6 | <0.50 | All Samples |
| | Toluene | 22 | 0.52 | BH18-7 |
| | 1,1,1-Trichloroethane | 200 | <0.50 | All Samples |
| | 1,1,2-Trichloroethane | 4.7 | <0.50 | All Samples |
| | Trichloroethylene | 1.6 | <0.50 | All Samples |
| | Trichlorofluoromethane | 150 | <5.0 | All Samples |
| | Vinyl chloride | 0.5 | <0.50 | All Samples |
| | Xylenes (Total) | 300 | <0.50 | All Samples |
| PAHs | Acenaphthene | 4.1 | <0.020 | All Samples |
| | Acenaphthylene | 1 | <0.020 | All Samples |
| | Anthracene | 1 | <0.020 | All Samples |
| | Benzo(a)anthracene | 1 | <0.020 | All Samples |
| | Benzo(a)pyrene | 0.01 | <0.010 | All Samples |
| | Benzo(b)fluoranthene | 0.1 | <0.020 | All Samples |
| | Benzo(g,h,i)perylene | 0.2 | <0.020 | All Samples |
| | Chrysene | 0.1 | <0.020 | All Samples |
| | Dibenzo(ah)anthracene | 0.2 | <0.020 | All Samples |
| | Fluoranthene | 0.41 | <0.020 | All Samples |
| | Fluorene | 120 | <0.020 | All Samples |
| | Indeno(1,2,3-cd)pyrene | 0.2 | <0.020 | All Samples |
| | 1+2-Methylnaphthalenes | 3.2 | <0.028 | All Samples |
| | 1-Methylnaphthalene | 3.2 | <0.020 | All Samples |
| | 2-Methylnaphthalene | 3.2 | <0.020 | All Samples |
| | Naphthalene | 11 | <0.050 | All Samples |
| | Phenanthrene | 1 | 0.029 | BH18-6 |
| | Pyrene | 4.1 | <0.020 | All Samples |
| OCPs | Aldrin | 0.35 | <0.010 | All Samples |
| | gamma-hexachlorocyclohexane | 0.95 | <0.010 | All Samples |
| | Chlordane (Total) | 0.06 | <0.057 | All Samples |
| | Total DDD | 1.8 | <0.042 | All Samples |

**Table 15: Summary of Maximum Concentrations in Groundwater**

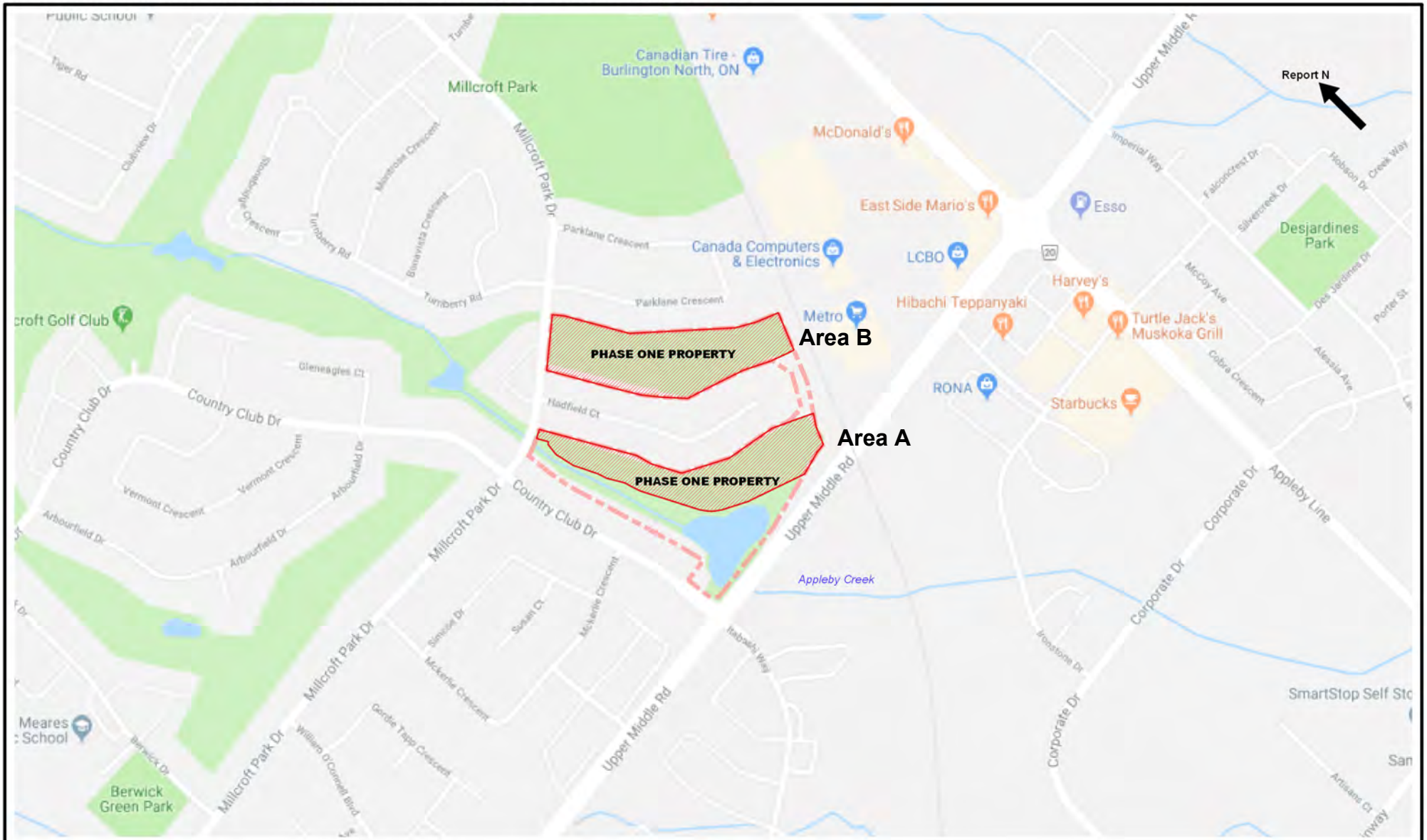
| Parameter | | Standard | Maximum Concentration | Location |
|---|---|---|---|---|
| OCPs | Total DDE | 10 | <0.011 | All Samples |
| | Total DDT | 0.05 | <0.042 | All Samples |
| | Dieldrin | 0.35 | <0.050 | All Samples |
| | Endosulfan (Total) | 0.56 | <0.042 | All Samples |
| | Endrin | 0.36 | <0.040 | All Samples |
| | Heptachlor | 0.038 | <0.010 | All Samples |
| | Heptachlor Epoxide | 0.038 | <0.010 | All Samples |
| | Hexachlorobenzene | 1 | <0.010 | All Samples |
| | Hexachlorobutadiene | 0.44 | <0.010 | All Samples |
| | Hexachloroethane | 2.1 | <0.010 | All Samples |
| | Methoxychlor | 0.3 | <0.050 | All Samples |

**Notes for Soil & Groundwater Summary Tables**

| | | |
|---|---|---|
| 1. | mbgs = | Meters below ground surface |
| 2. | masl = | Meters above sea level |
| 3. | | Units for all soil analyses are in µg/g (ppm) unless otherwise indicated |
| 4. | | Units for all groundwater analyses are in µg/L (ppb) unless otherwise indicated |
| 5. | MECP Table 8 SCS = | Generic Condition Standards in a Potable Groundwater Condition for Use within 30 m of a Water Body as contained in Table 8 of the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", published by the MECP on April 15, 2011 |
| 6. | | For soil and groundwater analytical results, concentration exceeds the applicable Standards |
| 7. | NM = | Not Monitored |
| 8. | PHC = | Petroleum Hydrocarbon |
| 9. | PAH = | Polycyclic Aromatic Hydrocarbon |
| 10. | BTEX = | Benzene, Toluene, Ethylbenzene, Xylene |
| 11. | OCPs = | Organochlorine Pesticides |

# Figures

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 1 - Phase One Property Location.qgs




Legend

- Site Boundary
- Phase One Property

0 150 300 m


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Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2155 Country Club Drive, Burlington, ON

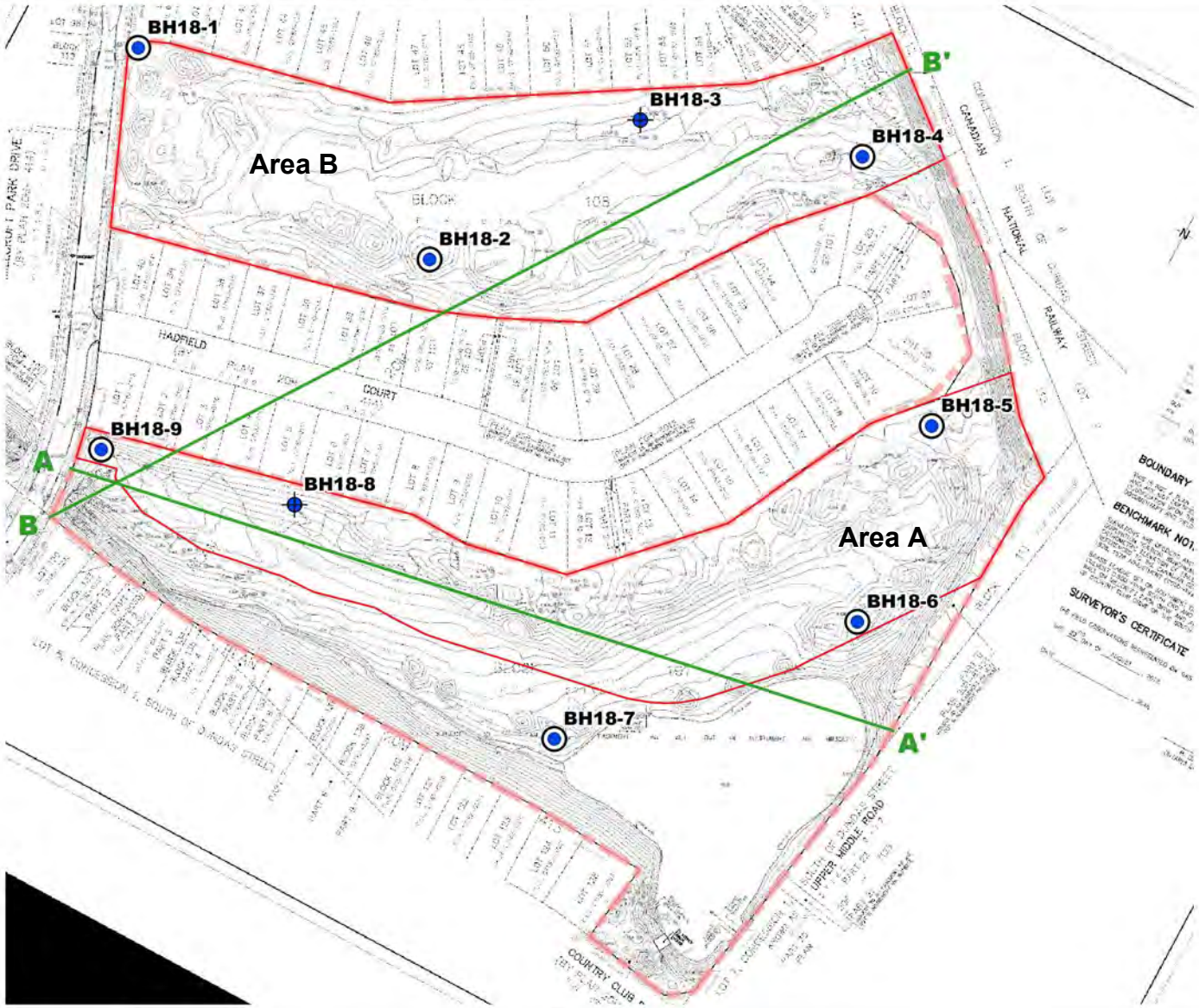
Title: **SITE LOCATION PLAN**

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: 1 |

Image/Map Source: *Google Street Map*

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 2 - Borehole Location Plan.qgs




Legend

- Site Boundary
- Phase One Property
- Cross Section Line
- Borehole Location
- Monitoring Well Location

0 50 100 m


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Title: **BOREHOLE AND MONITORING WELL LOCATIONS**

N

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: 2 |
| | Image/Map Source: *PDF Survey* | | |

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 3A - PCA Locations.qgs




*Potentially Contaminating Activities (PCAs)*

*1. PCA# 40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications*

*2. PCA#30. Importation of Fill Material of Unknown Quality*

*3. PCA#46. Other (Presence of railway lines)*

Legend

- Site Boundary
- Phase One Property
- 250m Buffer

0 100 200 m


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Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
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Title: **POTENTIALLY CONTAMINATING ACTIVITIES (PCAs)**

N

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: **3A** |

Image/Map Source: *Google Satellite Image*

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 3B - APEC Locations.qgs




*Areas of Potential Environmental Concern*
*APEC-1 Entire property. Historical use of pesticides and herbicides on the golf course.*
*APEC-2 Entire property. Use of fill materials of unknown quality.*
*APEC -3 southeastern portion. Proximity to CNR*

Legend

- Phase One Property
- Site Boundary
- 250m Buffer
- APEC 1 & 2
- APEC 3


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Title: **AREAS OF POTENTIAL ENVIRONMENTAL CONCERN**

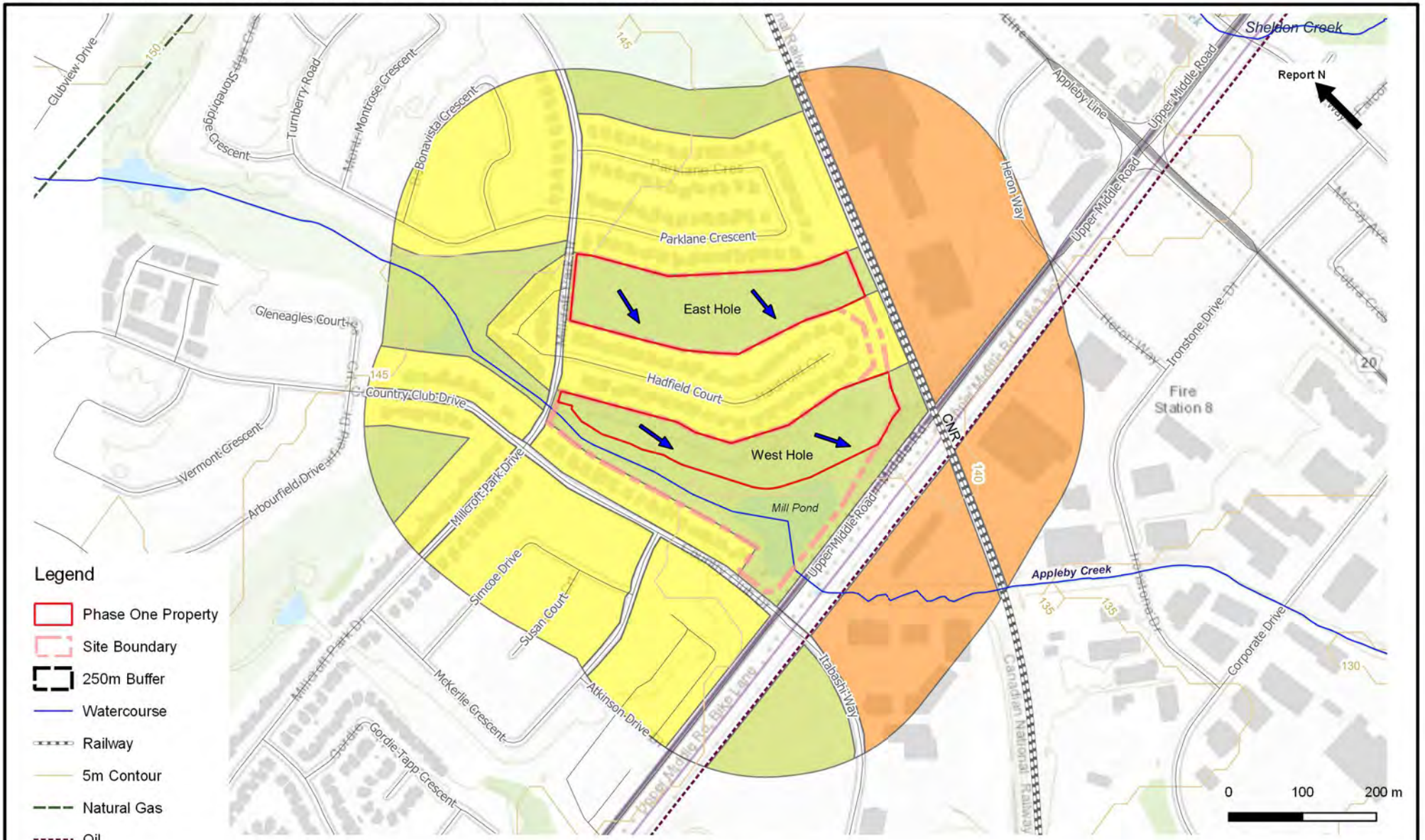
N

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: **3B** |

Image/Map Source: *Google Satellite Image*

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 4 - Phase One Conceptual Site Model.qgs




## Legend

- Phase One Property
- Site Boundary
- 250m Buffer
- Watercourse
- Railway
- 5m Contour
- Natural Gas
- Oil
- Power Line
- Groundwater Flow Direction
- Residential
- Commercial
- Parkland


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Title: **PHASE ONE CONCEPTUAL SITE MODEL**

N

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: | Scale: | Project No.: | Figure No.: |
| 0 | As Shown | 18-687-100 | 4 |

Image/Map Source: *Esri Topo Map*

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 5 - GW Elevation Contours.qgs




Legend

- Site Boundary
- Phase One Property
- Borehole Location
- Monitoring Well Location
- Groundwater Contour
- Groundwater Flow Direction

Groundwater Elevation on January 7, 2019


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Title: **GROUND WATER ELEVATION CONTOURS**

N

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: 5 |
| | Image/Map Source: *PDF Survey* | | |

J:\-GIS\18-687-20 Millcroft Golf Course_Argo (Millcroft) Ltd\1-QGIS\Phase Two\Figure 6 - Soil Characterization.qgs




| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-1 SS2 | 0.76-1.37 | Metals and ORPs | Pass |
| BH18-1 SS3 | 1.52-2.13 | OCPs | Pass |
| BH18-1 SS6 | 4.57-5.18 | PHCs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-3 SS1 | 0.00-0.60 | Metals and ORPs | Pass |
| BH18-3 SS2 | 0.76-1.37 | OCPs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-4 SS2 | 0.76-1.37 | PAHs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-2 SS2 | 0.76-1.37 | Metals and ORPs | Pass |
| BH18-2 SS3 | 1.52-2.13 | OCPs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-5 SS1 | 0.00-0.60 | Metals and ORPs, PAHs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-9 SS3 | 1.52-2.13 | PHCs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-6 SS1 | 0.00-0.60 | PAHs | Pass |
| BH18-6 SS2 | 0.76-1.37 | Metals and ORPs | Pass |
| BH18-6 SS3 | 1.52-2.13 | OCPs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-8 SS2 | 0.76-1.37 | OCPs | Pass |

| Sample ID | Sample Depth (m) | Parameter Analysed (O.Reg. 153/04 as amended) | Table 8 SCS |
|---|---|---|---|
| BH18-7 SS4 | 2.29-2.90 | PHCs | Pass |

Legend

- Site Boundary
- Phase Two Property
- Borehole Location
- Monitoring Well Location

0 50 100 m


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Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2155 Country Club Drive, Burlington, ON

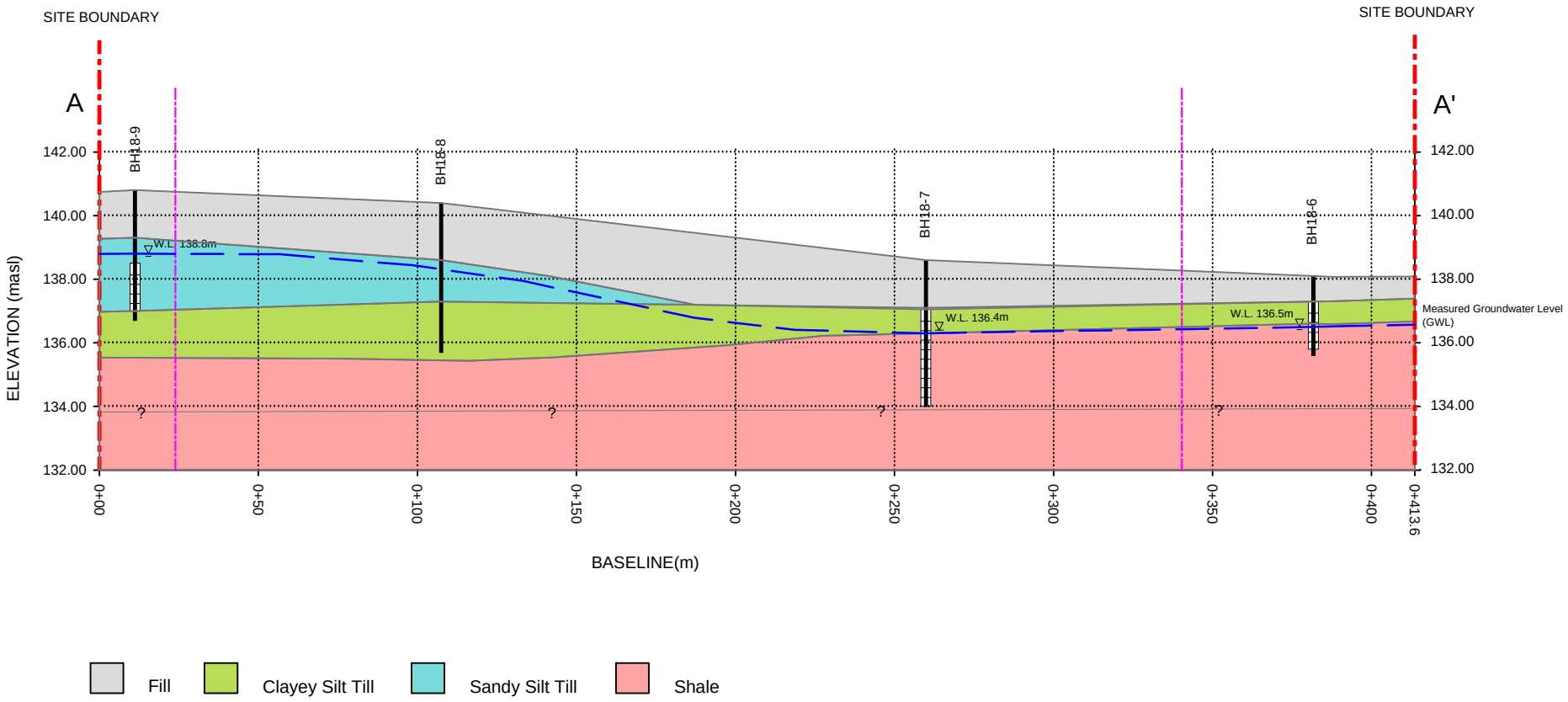
Title: **SOIL CHARACTERIZATION**

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev: 0 | Scale: As Shown | Project No.: 18-687-100 | Figure No.: 6 |

Image/Map Source: *Google Satellite Image*

Path:j:\-gis\18-687-20 millcroft golf course_argo (millcroft) ltd\7-misc\cad\geological cross sections -millcroft.dwg




Well

Screen

Phase Two Property Boundary


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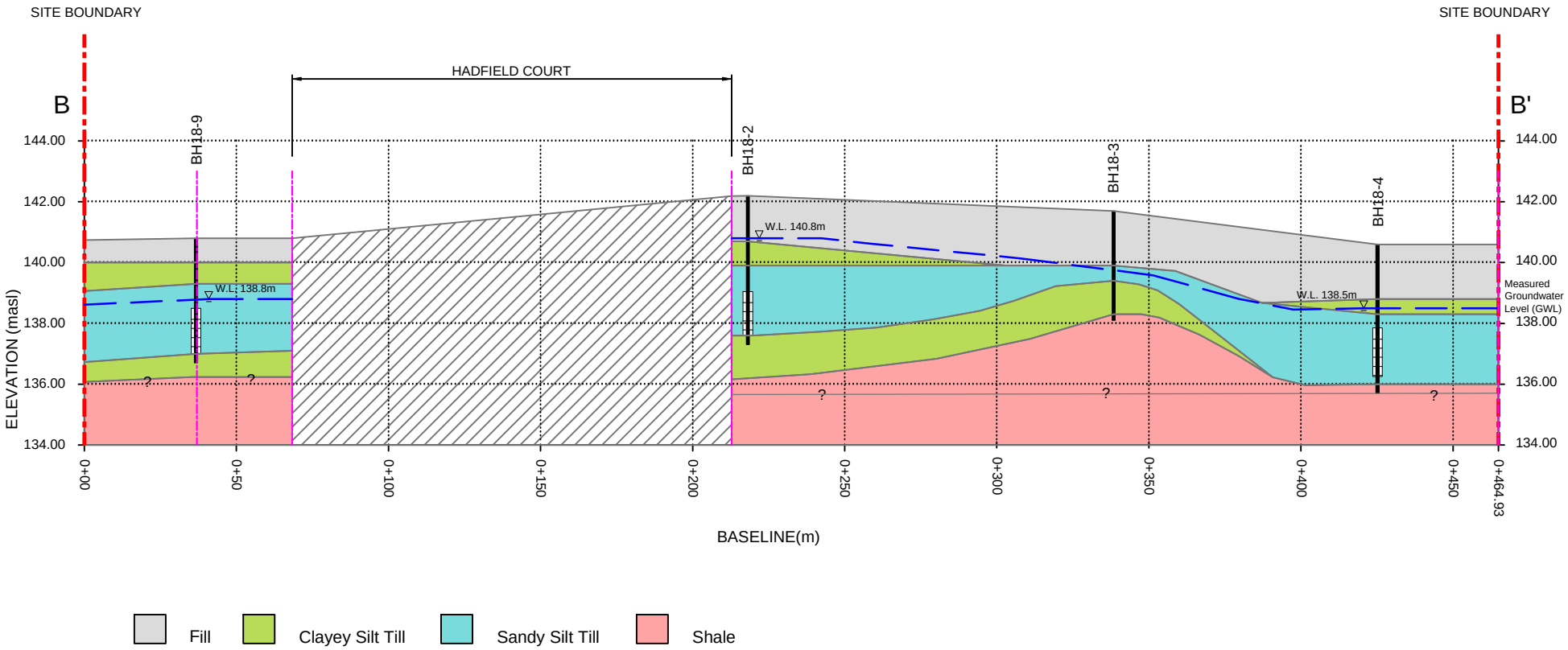

Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2155 Country Club Drive, Burlington, ON

Title: **GEOLOGICAL CROSS SECTION A-A'**

Client: ARGO DEVELOPMENT CORP.

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev. | Scale: 1:2000 | Project No: 18-687-100 | Figure No. 8A |

Path:j:\-gis\18-687-20 millcroft golf course_argo (millcroft) ltd\7-misc\cad\geological cross sections -millcroft.dwg





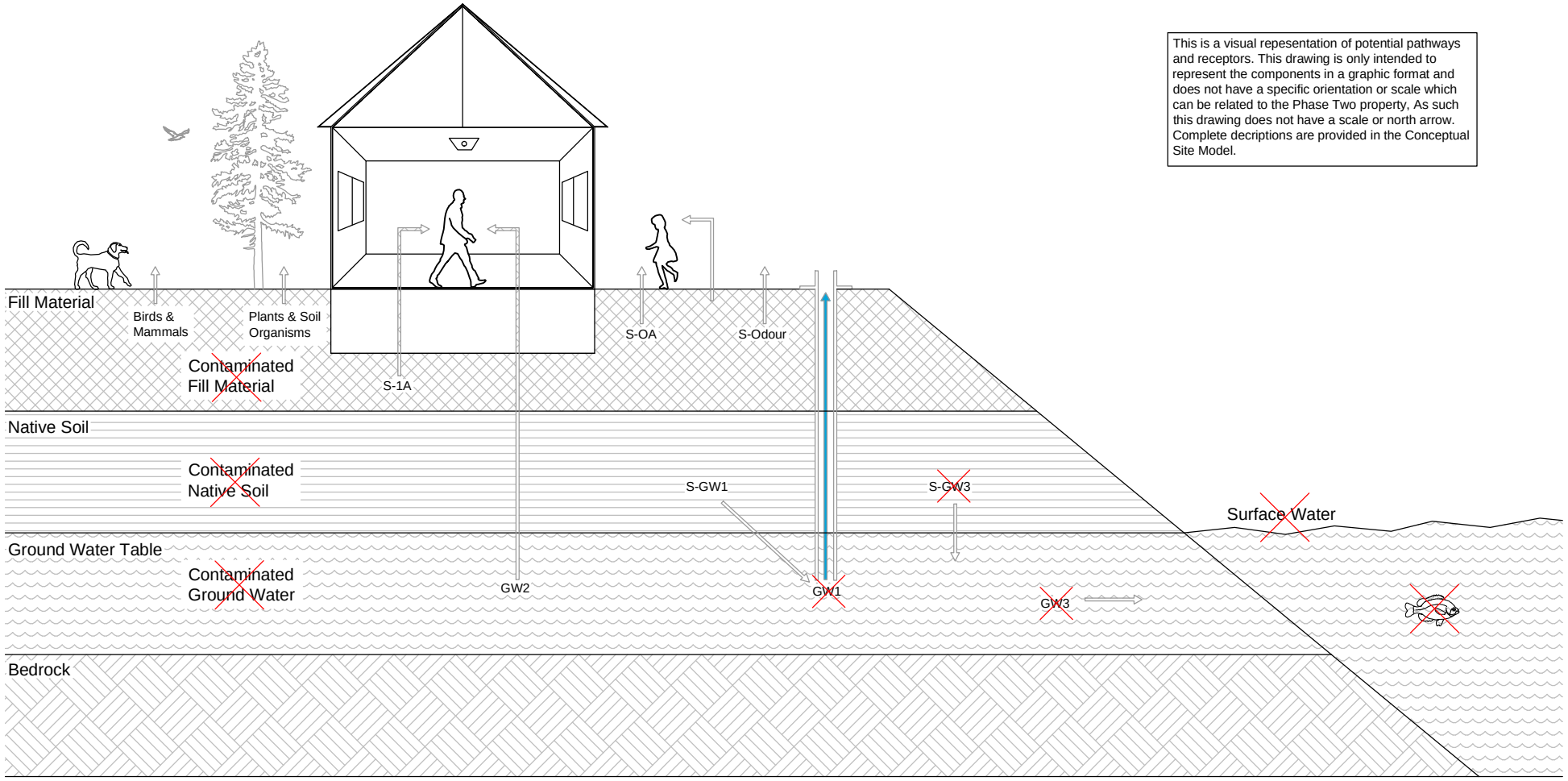
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Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2155 Country Club Drive, Burlington, ON

Title: **GEOLOGICAL CROSS SECTION B-B'**

| Client: | Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|---|
| ARGO DEVELOPMENT CORP. | 8.5 x 11 | S.A | S.Y | February 2019 |
| | Rev. | Scale: 1:2000 | Project No: 18-687-100 | Figure No. 8B |

Path:j:\-gis\18-687-20 millcroft golf course_argo (millcroft) ltd\7-misc\cad\figure 9 - phase two csm.dwg





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Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2155 Counrty Club Drive, Burlington, ON

Title: **PHASE TWO CONCEPTUAL SITE MODEL**

Client: ARGO DEVELOPMENT CORP

| Size: | Approved By: | Drawn By: | Date: |
|---|---|---|---|
| 8.5 x 11 | S.A | S.Y | February 2019 |
| Rev. | Scale: N.T.S | Project No: 18-687-100 | Figure No. 9 |

# Appendix A

# SKETCH SHOWING ELEVATIONS OF BLOCKS 107 AND 108 PLAN 20M–414 AND BLOCK 13, PLAN 20M–421 CITY OF BURLINGTON REGIONAL MUNICIPALITY OF HALTON

SCALE 1:750

10m 0m 10m 20m 30m 40m 50m 60m 70m 80m 90 metres

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**METRIC**

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

## LEGEND

| | |
|---|---|
| INV | DENOTES INVERT ELEVATION |
| Ø | DENOTES DIAMETER |
| 0.10Ø | DENOTES DECIDUOUS TREE |
| 0.10Ø | DENOTES CONIFEROUS TREE |
| BWB | DENOTES BELL BOX |
| MHST | DENOTES MANHOLE STORM WATER |
| MHSA | DENOTES MANHOLE SANITARY |
| CB | DENOTES CATCH BASIN |
| LS | DENOTES LIGHT STANDARD |
| WV | DENOTES WATER VALVE |
| MHB | DENOTES MANHOLE BELL |
| GLB | DENOTES GROUND LEVEL BOX |
| HV | DENOTES HYDRO VAULT |
| | DENOTES CONCRETE RETAINING WALL |
| | DENOTES SAND TRAP |

## BOUNDARY NOTE

THIS IS NOT A PLAN OF SURVEY. BOUNDARIES ARE COMPILED AND ARE NOT CERTIFIED BY THIS PLAN AND ARE SUBJECT TO CLARIFICATION UPON THE INCORPORATION OF ADDITIONAL DOCUMENTARY AND FIELD SURVEY EVIDENCE.

## BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF BURLINGTON VERTICAL BENCHMARK NUMBER 414 HAVING AN ORTHOMETRIC ELEVATION OF 139.893 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BRASS PLAQUE SET ON SOUTHWEST CORNER OF WING WALL OF CULVERT 0.50M FROM SOUTH END AND 0.13M BELOW TOP OF WALL ON MILLCROFT PARK DRIVE AND APPROXIMATELY 40M EAST OF COUNTRY CLUB DRIVE ON THE SOUTH SIDE OF THE ROAD.

## SURVEYOR'S CERTIFICATE

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 22nd DAY OF AUGUST, 2018.

DATE _____, 2018.

_____
R. DENBROEDER
ONTARIO LAND SURVEYOR


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DRAWN: A.K. CHECKED: R.D.
JOB No. 16–073 CAD FILE No. 16073tp01


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# Appendix B

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# LOG OF BOREHOLE BH18-1



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4805100.1 E 597203.488

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-18-2018

REF. NO.: 18-687-100
ENCL NO.: 2

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100 | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ WATER CONTENT (%) 10 20 30 | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 142.8 | | | | | | | | | | | | |
| 142.0 | **TOPSOIL:** 140 mm | | | | | | | | | | | |
| 0.1 | **FILL:**clayey silt, trace rootlets, moist, dark brown to brown, loose to compact | | 1 | SS | 8 | | | | | | | HEX: 35ppm IBL: 0ppm |
| | | | 2 | SS | 20 | | 142 | | | | | HEX: 55ppm IBL: 0ppm |
| | | | | | | | Bentonite | | | | | |
| 141.0 | | | 3 | SS | 32 | | 141 | | | | | HEX: 35ppm IBL: 0ppm |
| 1.8 | **SANDY SILT TILL:**some gravel/cobbles, trace clay, greyish brown, moist, dense to very dense | | | | | | | | | | | |
| | reddish brown below 2.3 m | | 4 | SS | 80/ 230mm | | Filter Pack | | | | | HEX: 40ppm IBL: 0ppm 14 23 54 9 |
| 139.7 | | | | | | | | | | | | |
| 3.1 | **CLAYEY SILT TILL/SHALE COMPLEX:** reddish brown, moist, hard | | 5 | SS | 50/ 50mm | | 139 | | | | | HEX: 55ppm IBL: 0ppm |
| | | | | | | | W. L. 138.6 m Jan 03, 2019n Jan 07, 2019 | | | | | |
| | | | | | | | Slotted Pipe | | | | | |
| | | | 6 | SS | 50/ 50mm | | 138 | | | | | HEX: 60ppm IBL: 0ppm |
| | | | | | | | 137 | | | | | |
| 136.7 | | | | | | | | | | | | |
| 6.1 | **SHALE BEDROCK:** Highly weathered shale | | 7 | SS | 50/ 100mm | | | | | | | HEX: 70ppm IBL: 0ppm |
| 136.5 | | | | | | | | | | | | |
| 6.3 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 4.16 |
| Jan. 7, 2019 | 4.27 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ 8 ε=3% Strain at Failure

DS SOIL LOG 18-687-100 - MILLCROFT GOLF COURSE, BURLINGTON.GPJ DS.GDT 19-2-15

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# LOG OF BOREHOLE BH18-2



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4805001.917 E 597344.446

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-18-2018

REF. NO.: 18-687-100
ENCL NO.: 3

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES: NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ / WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 142.2 | | | | | | | | | | | | |
| 142.0 | **TOPSOIL:** | | | | | | | | | | | |
| 0.1 | **FILL:** clayey silt, trace topsoil, very moist, brown, loose to compact | | 1 | SS | 5 | | 142 | | | | | HEX: 45ppm IBL: 0ppm |
| 1 | | | 2 | SS | 15 | ▽ W. L. 141.1 m Jan 03, 2019 | | | | | | HEX: 40ppm IBL: 0ppm |
| 140.7 | | | | | | ▼ W. L. 140.8 m Jan 07, 2019 | | | | | | |
| 1.5 | **CLAYEY SILT TILL:** sandy, trace gravel/cobble, greyish brown, moist, hard | | 3 | SS | 32 | | | | | | | HEX: 30ppm IBL: 0ppm |
| 2 | | | | | | | 140 | | | | | |
| 139.9 | | | | | | | | | | | | |
| 2.3 | **SANDY SILT TILL:** trace clay, trace gravel/cobbles, reddish brown, moist, very dense | | 4 | SS | 50 | Filter Pack | | | | | | HEX: 25ppm IBL: 0ppm |
| 3 | | | | | | | 139 | | | | | |
| | | | 5 | SS | 50/ 150 mm | | | | | | | HEX: 30ppm IBL: 0ppm |
| 4 | | | | | | Slotted Pipe | | | | | | |
| 137.6 | | | | | | | 138 | | | | | |
| 137.6 | **CLAYEY SILT TILL:** trace sand, | | 6 | SS | 50/ 75mm | | | | | | | HEX: 30 ppm IBL: 0ppm |
| 4.7 | reddish brown, moist, hard | | | | | | | | | | | |
| 137.3 | **SHALE BEDROCK:** Highly | | | | | | | | | | | |
| 4.9 | weathered shale | | | | | | | | | | | |
| | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 1.04 |
| Jan. 7, 2019 | 1.36 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ 8 ε=3% Strain at Failure

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# LOG OF BOREHOLE BH18-3



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4805069.474 E 597444.447

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-18-2018

REF. NO.: 18-687-100
ENCL NO.: 4

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES: NUMBER | TYPE | "N" BLOWS 0.3 m | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ / WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 141.7 | | | | | | | | | | | | |
| 141.6 | **TOPSOIL:** | | | | | | | | | | | |
| 0.1 | **FILL:** clayey silt, trace topsoil, very moist, brown to reddish brown, loose to compact | | 1 | SS | 7 | | | | ○ | | | HEX: 20ppm IBL: 0ppm |
| | | | 2 | SS | 21 | | 141 | | ○ | | | HEX: 40ppm IBL: 0ppm |
| 139.9 | | | 3 | SS | 29 | | 140 | | ○ | | | HEX: 30ppm IBL: 0ppm |
| 1.8 | **SANDY SILT TILL:** silt pockets, trace gravel/cobbles, reddish brown, moist, compact to very dense | | | | | | | | | | | |
| 139.4 | | | | | | | | | | | | |
| 2.3 | **CLAYEY SILT TILL:** trace sand, reddish brown to grey, hard | | 4 | SS | 84/ 280mm | | 139 | | ○ | | | HEX: 40ppm IBL: 0ppm |
| 138.3 | | | 5 | SS | 87/ 255mm | | | | ○ | | | HEX: 45ppm IBL: 0ppm |
| 3.4 | **SHALE BEDROCK:** Highly weathered shale | | | | | | | | | | | |
| 138.1 | | | | | | | | | | | | |
| 3.6 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) Borehole dry upon completion

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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# LOG OF BOREHOLE BH18-4



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4805053.465 E 597551.071

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-19-2018

REF. NO.: 18-687-100
ENCL NO.: 5

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES NUMBER | TYPE | "N" BLOWS 0.3 m | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ / WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140.6 | | | | | | | | | | | | |
| 0.0 / 140.4 | **TOPSOIL:** 180 mm | | | | | | | | | | | |
| 0.2 | **FILL:** clayey silt, trace rootlets, moist, dark brown to brown, compact | | 1 | SS | 11 | | | | | | | HEX: 0ppm IBL: 0ppm |
| | | | 2 | SS | 11 | | 140 Bentonite | | | | | HEX: 0ppm IBL: 0ppm |
| 138.8 | | | 3 | SS | 61 | ▽ | 139 W. L. 138.8 m Jan 03, 2019 | | | | | HEX: 0ppm IBL: 0ppm |
| 1.8 / 138.3 | **CLAYEY SILT TILL:** trace sand, trace gravel/cobbles, reddish brown, moist, hard | | | | | ▽ | W. L. 138.5 m Jan 07, 2019 | | | | | |
| 2.3 | **SANDY SILT TILL:** trace clay, some gravel/cobbles, reddish brown, moist, very dense | | 4 | SS | 50/ 50mm | | Filter Pack 138 | | | | | HEX: 5ppm IBL: 0ppm |
| | | | 5 | SS | 50/ 25mm | | Slotted Pipe 137 | | | | | HEX: 5ppm IBL: 0ppm |
| 136.0 | | | | | | | 136 | | | | | |
| 4.6 / 135.8 | **SHALE BEDROCK:** Highly weathered shale | | 6 | SS | 50/ 25mm | | | | | | | HEX: 0ppm IBL: 0ppm |
| 4.8 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 1.76 |
| Jan. 7, 2019 | 2.07 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ 8=3% Strain at Failure

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# LOG OF BOREHOLE BH18-5



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4804925.877 E 597586.938

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-19-2018

REF. NO.: 18-687-100
ENCL NO.: 6

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | NUMBER | TYPE | "N" BLOWS 0.3 m | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ — WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140.2 | | | | | | | | | | | | |
| 0.0 / 139.8 | **TOPSOIL:** 350 mm | | 1 | SS | 4 | | 140 | | | | | HEX: 35ppm IBL: 0ppm |
| 0.4 | **FILL:**clayey silt, trace topsoil, moist, dark brown to brown, loose | | | | | Bentonite | | | | | | |
| 1 | | | 2 | SS | 9 | Filter Pack | | | | | | HEX: 15ppm IBL: 0ppm |
| 138.3 | | | 3 | SS | 26 | | | | | | | HEX: 45ppm IBL: 0ppm |
| 2 1.9 | **CLAYEY SILT TILL:** sandy, some gravel/cobbles, reddish brown, moist, very stiff to hard | | | | | | 138 | | | | | |
| | | | 4 | SS | 77 | W. L. 137.5 m Jan 03, 2019 | | | | | | HEX: 30ppm IBL: 0ppm 17 28 29 26 |
| 3 | trace shale fragments below 3.1 m | | | | | Slotted Pipe | 137 | | | | | |
| | | | 5 | SS | 99 | W. L. 136.7 m Jan 07, 2019 | | | | | | HEX: 30ppm IBL: 0ppm |
| 4 | | | | | | | 136 | | | | | |
| 135.6 | | | | | | | | | | | | |
| 4.6 / 135.4 | **SHALE BEDROCK:** Highly weathered shale | | 6 | SS | 50/ 100mm | | | | | | | HEX: 35ppm IBL: 0ppm |
| 4.8 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 2.62 |
| Jan. 7, 2019 | 3.44 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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# LOG OF BOREHOLE BH18-6



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4804813.93 E 597552.765

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-19-2018

REF. NO.: 18-687-100
ENCL NO.: 7

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES: NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 138.1 | | | | | | | | | | | | |
| 138.0 | **TOPSOIL:** | | | | | | 138 | | | | | |
| 0.1 | **FILL:** clayey silt, very moist, brown, loose | | 1 | SS | 4 | | Bentonite | | ○ | | | HEX: 50ppm IBL: 0ppm |
| 137.3 | | | | | | | Filter Pack | | | | | |
| 0.8 | **SANDY SILT TILL:** trace clay, trace gravel/cobbles, trace shale fragments, reddish brown, moist, very dense | | 2 | SS | 59 | | 137 | | ○ | | | HEX: 45ppm IBL: 0ppm 5 34 57 4 |
| 136.6 | | | | | | | W. L. 136.6 m Jan 03, 2019n Jan 07, 2019 | | | | | |
| 1.5 | **SHALE BEDROCK:** Highly weathered shale | | 3 | SS | 67 | | | | ○ | | | HEX: 35ppm IBL: 0ppm |
| | | | | | | | 136 | | | | | |
| 135.6 | | | 4 | SS | 50/ 25mm | | | | ○ | | | HEX: 40ppm IBL: 0ppm |
| 2.5 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) Auger refusal at 2.3 m
2) 50mm dia. monitoring well installed upon completion.
3) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 1.49 |
| Jan. 7, 2019 | 1.60 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-687-100 - MILLCROFT GOLF COURSE, BURLINGTON.GPJ DS.GDT 19-2-15

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

# LOG OF BOREHOLE BH18-7



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4804773.829 E 597407.198

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-20-2018

REF. NO.: 18-687-100
ENCL NO.: 8

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES NUMBER | TYPE | BLOWS "N" 0.3 m | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 138.6 | | | | | | | | | | | | |
| 138.6 | **TOPSOIL:** | | | | | | | | | | | |
| 0.1 | **FILL:** clayey silt, trace rootlet/ topsoil, moist, dark brown to brown, loose | | 1 | SS | 4 | | | | | | | HEX: 30ppm IBL: 0ppm |
| | | | | | | | Bentonite | | | | | |
| 1 | | | 2 | SS | 8 | | | | | | | HEX: 55ppm IBL: 0ppm |
| 137.1 | | | | | | | Filter Pack | | | | | |
| 1.5 | **CLAYEY SILT TILL:** sandy, some gravel/cobbles, reddish brown to grey, moist, hard | | 3 | SS | 43 | | 137 | | | | | HEX: 45ppm IBL: 0ppm |
| 2 | | | | | | W. L. 136.5 m Jan 03, 2019 Jan 07, 2019 | | | | | | 16 22 46 16 |
| 136.3 | | | | | | | | | | | | |
| 2.3 | **SHALE BEDROCK:** Highly weathered shale | | 4 | SS | 50/ 50mm | | 136 | | | | | HEX: 55ppm IBL: 0ppm |
| 3 | | | | | | | Slotted Pipe | | | | | |
| | | | 5 | SS | 50/ 100mm | | 135 | | | | | HEX: 45ppm IBL: 0ppm |
| 4 | | | 6 | SS | 50/ 25mm | | | | | | | HEX: 45ppm IBL: 0ppm |
| 134.0 | | | | | | | 134 | | | | | |
| 4.6 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) Water level at 2.1 mbgl upon completion of drilling
2) 50mm dia. monitoring well installed upon completion.
3) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 2.06 |
| Jan. 7, 2019 | 2.14 |

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-687-100 - MILLCROFT GOLF COURSE, BURLINGTON.GPJ DS.GDT 19-2-15

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# LOG OF BOREHOLE BH18-8



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4804883.544 E 597281.841

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-20-2018

REF. NO.: 18-687-100
ENCL NO.: 9

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|
| 140.4 | | | | | | | | |
| 140.0 | **TOPSOIL:** | | | | | | | |
| 0.1 | **FILL:**clayey silt, trace rootlet/ topsoil, trace organics, moist, dark brown to brown, loose | | 1 | SS | 8 | | 140 | HEX: 45ppm IBL: 0ppm |
| 1 | | | 2 | SS | 8 | | 139 | HEX: 75ppm IBL: 0ppm |
| 138.6 | | | 3 | SS | 16 | | | HEX: 55ppm IBL: 0ppm |
| 1.8 | **SANDY SILT TILL :**trace clay, trace gravel/cobbles, reddish brown, moist, compact | | | | | | 138 | |
| 2 | | | 4 | SS | 23 | | | HEX: 50ppm IBL: 0ppm |
| 3 137.3 | | | | | | | | |
| 3.1 | **CLAYEY SILT TILL:** sandy, trace gravel/cobbles, trace shale fragments, reddish brown, moist, hard | | 5 | SS | 66/ 230mm | | 137 | HEX: 40ppm IBL: 0ppm |
| 4 | | | | | | | 136 | |
| 135.7 | | | 6 | SS | 50/ 100mm | | | HEX: 45ppm IBL: 0ppm |
| 4.7 | **END OF BOREHOLE** Notes: 1) Auger refusal at 4.6 m 2) Borehole dry upon completion | | | | | | | |

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT $w_P$ | NATURAL MOISTURE CONTENT $w$ | LIQUID LIMIT $w_L$
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-687-100 - MILLCROFT GOLF COURSE, BURLINGTON.GPJ DS.GDT 19-2-15

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

# LOG OF BOREHOLE BH18-9



PROJECT: Geotechnical, Environmental, Hydrogeological Investigation
CLIENT: Argo Development Corp
PROJECT LOCATION: 2155 Country Club Drive, Burlington
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4804908.419 E 597188.154

**DRILLING DATA**
Method: Solid Stem Auger
Diameter: 150 mm
Date: Dec-20-2018

REF. NO.: 18-687-100
ENCL NO.: 10

| (m) ELEV / DEPTH | DESCRIPTION | STRATA PLOT | SAMPLES: NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ — WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140.8 | | | | | | | | | | | | |
| 140.7 | **TOPSOIL:** 130 mm | | | | | | | | | | | |
| 0.1 / 140.0 | **FILL:** clayey silt, trace rootlet/ topsoil, moist, dark brown to brown, loose | | 1 | SS | 7 | | | | | | | HEX: 40ppm IBL: 0ppm |
| 0.8 / 139.3 | **CLAYEY SILT TILL:** some sand, trace gravel/cobbles, greyish brown, moist, hard | | 2 | SS | 30 | | 140 Bentonite | | | | | HEX: 35ppm IBL: 0ppm |
| 1.5 | **SANDY SILT TILL:** trace to some clay, some gravel/cobbles, reddish brown, moist, dense to very dense | | 3 | SS | 47 | W. L. 139.1 m Jan 03, 2019 W. L. 138.8 m Jan 07, 2019 | | | | | | HEX: 45ppm IBL: 0ppm |
| | | | 4 | SS | 81 | | 138 | | | | | HEX: 45ppm IBL: 0ppm 15 28 47 10 |
| | | | 5 | SS | 95/ 250mm | | Slotted Pipe | | | | | HEX: 45ppm IBL: 0ppm |
| 3.8 / 137.0 | | | | | | | 137 | | | | | |
| 4 / 136.7 | **CLAYEY SILT TILL/SHALE COMPLEX:** reddish brown, trace shale fragments, moist, hard | | 6 | SS | 99/ 180mm | | | | | | | |
| 4.1 | **END OF BOREHOLE** | | | | | | | | | | | |

Notes:
1) Auger refusal at 3.9 m
2) 50mm dia. monitoring well installed upon completion.
3) Water Level Readings

| Date | Water Depth (mbgs) |
|---|---|
| Jan. 3, 2019 | 1.74 |
| Jan. 7, 2019 | 1.95 |

HEX: 40ppm IBL: 0ppm

DS SOIL LOG 18-687-100 - MILLCROFT GOLF COURSE, BURLINGTON.GPJ DS.GDT 19-2-15

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

# Appendix C

DS Consultants (Vaughan)
ATTN: Shafi Andseta
6221 Highway 7
Unit 16
Vaughan ON L4H 0K8

Date Received: 21-DEC-18
Report Date: 03-JAN-19 12:49 (MT)
Version: FINAL REV. 2

Client Phone: 647-237-5110

# Certificate of Analysis

## Lab Work Order #: L2213801

Project P.O. #: 18-687-20
Job Reference:
C of C Numbers: 17-616382
Legal Site Desc:

Comments: 03-JAN-19 Report type revision to compare to Table 8 as per client request. -A.Fazekas

Amanda Fazekas
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

# ANALYTICAL REPORT

## Summary of Guideline Exceedances

| Guideline ALS ID | Client ID | Grouping | Analyte | Result | Guideline Limit | Unit |
|---|---|---|---|---|---|---|

**Ontario Regulation 153/04 - April 15, 2011 Standards - T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

(No parameter exceedances)

# ANALYTICAL REPORT

## Physical Tests - SOIL

| | | Lab ID | L2213801-1 | L2213801-2 | L2213801-3 | L2213801-4 | L2213801-5 | L2213801-6 | L2213801-7 |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 18-DEC-18 | 20-DEC-18 | 20-DEC-18 | 19-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 |
| | | Sample ID | BH18-1 SS6 | BH18-7 SS4 | BH18-9 SS3 | BH18-6 SS1 | BH18-5 SS1 | BH18-4 SS2 | DUP 3 |
| | | Guide Limits | | | | | | | |
| Analyte | Unit | #1 | #2 | | | | | | |
| % Moisture | % | - | - | 5.59 | 5.44 | 8.49 | 12.3 | 26.8 | 15.1 | 12.9 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Volatile Organic Compounds - SOIL

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | **Lab ID** | L2213801-1 | L2213801-2 | L2213801-3 |
| | | | **Sample Date** | 18-DEC-18 | 20-DEC-18 | 20-DEC-18 |
| | | | **Sample ID** | BH18-1 SS6 | BH18-7 SS4 | BH18-9 SS3 |
| **Analyte** | **Unit** | **Guide Limits #1** | **#2** | | | |
| Benzene | ug/g | 0.02 | - | <0.0068 | <0.0068 | <0.0068 |
| Ethylbenzene | ug/g | 0.05 | - | <0.018 | <0.018 | <0.018 |
| Toluene | ug/g | 0.2 | - | <0.080 | <0.080 | <0.080 |
| o-Xylene | ug/g | - | - | <0.020 | <0.020 | <0.020 |
| m+p-Xylenes | ug/g | - | - | <0.030 | <0.030 | <0.030 |
| Xylenes (Total) | ug/g | 0.05 | - | <0.050 | <0.050 | <0.050 |
| Surrogate: 4-Bromofluorobenzene | % | - | - | 103.7 | 102.0 | 107.4 |
| Surrogate: 1,4-Difluorobenzene | % | - | - | 104.8 | 105.3 | 109.6 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Hydrocarbons - SOIL

| | | Guide Limits | | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Unit** | **#1** | **#2** | | | |
| **Lab ID** | | | | L2213801-1 | L2213801-2 | L2213801-3 |
| **Sample Date** | | | | 18-DEC-18 | 20-DEC-18 | 20-DEC-18 |
| **Sample ID** | | | | BH18-1 SS6 | BH18-7 SS4 | BH18-9 SS3 |
| F1 (C6-C10) | ug/g | 25 | - | <5.0 | <5.0 | <5.0 |
| F1-BTEX | ug/g | 25 | - | <5.0 | <5.0 | <5.0 |
| F2 (C10-C16) | ug/g | 10 | - | <10 | <10 | <10 |
| F3 (C16-C34) | ug/g | 240 | - | <50 | <50 | <50 |
| F4 (C34-C50) | ug/g | 120 | - | <50 | <50 | <50 |
| Total Hydrocarbons (C6-C50) | ug/g | - | - | <72 | <72 | <72 |
| Chrom. to baseline at nC50 | | - | - | YES | YES | YES |
| Surrogate: 2-Bromobenzotrifluoride | % | - | - | 91.8 | 101.5 | 97.6 |
| Surrogate: 3,4-Dichlorotoluene | % | - | - | 99.0 | 89.9 | 96.1 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Polycyclic Aromatic Hydrocarbons - SOIL

| | | Guide Limits | | | | | |
|---|---|---|---|---|---|---|---|
| **Lab ID** | | | | L2213801-4 | L2213801-5 | L2213801-6 | L2213801-7 |
| **Sample Date** | | | | 19-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 |
| **Sample ID** | | | | BH18-6 SS1 | BH18-5 SS1 | BH18-4 SS2 | DUP 3 |
| **Analyte** | **Unit** | **#1** | **#2** | | | | |
| Acenaphthene | ug/g | 0.072 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Acenaphthylene | ug/g | 0.093 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Anthracene | ug/g | 0.22 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(a)anthracene | ug/g | 0.36 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(a)pyrene | ug/g | 0.3 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(b)fluoranthene | ug/g | 0.47 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(g,h,i)perylene | ug/g | 0.68 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Benzo(k)fluoranthene | ug/g | 0.48 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Chrysene | ug/g | 2.8 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Dibenzo(ah)anthracene | ug/g | 0.1 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Fluoranthene | ug/g | 0.69 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Fluorene | ug/g | 0.19 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Indeno(1,2,3-cd)pyrene | ug/g | 0.23 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| 1+2-Methylnaphthalenes | ug/g | 0.59 | - | <0.042 | <0.042 | <0.042 | <0.042 |
| 1-Methylnaphthalene | ug/g | 0.59 | - | <0.030 | <0.030 | <0.030 | <0.030 |
| 2-Methylnaphthalene | ug/g | 0.59 | - | <0.030 | <0.030 | <0.030 | <0.030 |
| Naphthalene | ug/g | 0.09 | - | <0.013 | <0.013 | <0.013 | <0.013 |
| Phenanthrene | ug/g | 0.69 | - | <0.046 | <0.046 | <0.046 | <0.046 |
| Pyrene | ug/g | 1 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Surrogate: 2-Fluorobiphenyl | % | - | - | 108.3 | 109.7 | 109.3 | 108.1 |
| Surrogate: p-Terphenyl d14 | % | - | - | 104.2 | 114.4 | 107.5 | 114.0 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# Reference Information

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| **BTX-511-HS-WT** | Soil | BTEX-O.Reg 153/04 (July 2011) | SW846 8260 |

BTX is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **F1-F4-511-CALC-WT** | Soil | F1-F4 Hydrocarbon Calculated Parameters | CCME CWS-PHC, Pub #1310, Dec 2001-S |

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

| | | | |
|---|---|---|---|
| **F1-HS-511-WT** | Soil | F1-O.Reg 153/04 (July 2011) | E3398/CCME TIER 1-HS |

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **F2-F4-511-WT** | Soil | F2-F4-O.Reg 153/04 (July 2011) | CCME Tier 1 |

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from soil with 1:1 hexane:acetone using a rotary extractor. Extracts are treated with silica gel to remove polar organic interferences. F2, F3, & F4 are analyzed by GC-FID. F4G-sg is analyzed gravimetrically.

Notes:
1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where both F4 (C34-C50) and F4G-sg are reported for a sample, the larger of the two values is used for comparison against the relevant CCME guideline for F4.
7. F4G-sg cannot be added to the C6 to C50 hydrocarbon results to obtain an estimate of total extractable hydrocarbons.
8. This method is validated for use.
9. Data from analysis of validation and quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram, unless otherwise indicated.

# Reference Information

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **METHYLNAPS-CALC-WT** | Soil | ABN-Calculated Parameters | SW846 8270 |
| **MOISTURE-WT** | Soil | % Moisture | CCME PHC in Soil - Tier 1 (mod) |
| **PAH-511-WT** | Soil | PAH-O.Reg 153/04 (July 2011) | SW846 3510/8270 |

A representative sub-sample of soil is fortified with deuterium-labelled surrogates and a mechanical shaking techniqueis used to extract the sample with a mixture of methanol and toluene. The extracts are concentrated and analyzed by GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **XYLENES-SUM-CALC-WT** | Soil | Sum of Xylene Isomer Concentrations | CALCULATION |

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-616382

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

| Laboratory Definition Code | Laboratory Location |
|---|---|
| WT | ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA |

**GLOSSARY OF REPORT TERMS**

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*
*mg/kg - milligrams per kilogram based on dry weight of sample*
*mg/kg wwt - milligrams per kilogram based on wet weight of sample*
*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*
*mg/L - unit of concentration based on volume, parts per million.*
*< - Less than.*
*D.L. - The reporting limit.*
*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*
*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*
*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

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

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **BTX-511-HS-WT** | **Soil** | | | | | | | |
| **Batch R4414487** | | | | | | | | |
| **WG2960158-4 DUP** | | **WG2960158-3** | | | | | | |
| Benzene | | <0.0068 | <0.0068 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| Ethylbenzene | | <0.018 | <0.018 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| m+p-Xylenes | | <0.030 | <0.030 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| o-Xylene | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| Toluene | | <0.080 | <0.080 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| **WG2960158-2 LCS** | | | | | | | | |
| Benzene | | | 103.1 | | % | | 70-130 | 27-DEC-18 |
| Ethylbenzene | | | 98.4 | | % | | 70-130 | 27-DEC-18 |
| m+p-Xylenes | | | 97.0 | | % | | 70-130 | 27-DEC-18 |
| o-Xylene | | | 100.3 | | % | | 70-130 | 27-DEC-18 |
| Toluene | | | 99.4 | | % | | 70-130 | 27-DEC-18 |
| **WG2960158-1 MB** | | | | | | | | |
| Benzene | | | <0.0068 | | ug/g | | 0.0068 | 27-DEC-18 |
| Ethylbenzene | | | <0.018 | | ug/g | | 0.018 | 27-DEC-18 |
| m+p-Xylenes | | | <0.030 | | ug/g | | 0.03 | 27-DEC-18 |
| o-Xylene | | | <0.020 | | ug/g | | 0.02 | 27-DEC-18 |
| Toluene | | | <0.080 | | ug/g | | 0.08 | 27-DEC-18 |
| Surrogate: 1,4-Difluorobenzene | | | 110.6 | | % | | 50-140 | 27-DEC-18 |
| Surrogate: 4-Bromofluorobenzene | | | 107.8 | | % | | 50-140 | 27-DEC-18 |
| **WG2960158-5 MS** | | **L2212094-6** | | | | | | |
| Benzene | | | 104.1 | | % | | 60-140 | 27-DEC-18 |
| Ethylbenzene | | | 100.3 | | % | | 60-140 | 27-DEC-18 |
| m+p-Xylenes | | | 98.5 | | % | | 60-140 | 27-DEC-18 |
| o-Xylene | | | 101.4 | | % | | 60-140 | 27-DEC-18 |
| Toluene | | | 101.8 | | % | | 60-140 | 27-DEC-18 |
| **F1-HS-511-WT** | **Soil** | | | | | | | |
| **Batch R4414487** | | | | | | | | |
| **WG2960158-4 DUP** | | **WG2960158-3** | | | | | | |
| F1 (C6-C10) | | <5.0 | <5.0 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| **WG2960158-2 LCS** | | | | | | | | |
| F1 (C6-C10) | | | 104.2 | | % | | 80-120 | 27-DEC-18 |
| **WG2960158-1 MB** | | | | | | | | |
| F1 (C6-C10) | | | <5.0 | | ug/g | | 5 | 27-DEC-18 |
| Surrogate: 3,4-Dichlorotoluene | | | 100.5 | | % | | 60-140 | 27-DEC-18 |
| **WG2960158-6 MS** | | **L2213111-12** | | | | | | |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **F1-HS-511-WT** | **Soil** | | | | | | | |
| **Batch R4414487** | | | | | | | | |
| **WG2960158-6 MS** | | **L2213111-12** | | | | | | |
| F1 (C6-C10) | | | 102.0 | | % | | 60-140 | 27-DEC-18 |
| **F2-F4-511-WT** | **Soil** | | | | | | | |
| **Batch R4416973** | | | | | | | | |
| **WG2960108-4 DUP** | | **WG2960108-3** | | | | | | |
| F2 (C10-C16) | | <10 | <10 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| F3 (C16-C34) | | <50 | <50 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| F4 (C34-C50) | | <50 | <50 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| **WG2960108-2 LCS** | | | | | | | | |
| F2 (C10-C16) | | | 106.5 | | % | | 80-120 | 27-DEC-18 |
| F3 (C16-C34) | | | 109.3 | | % | | 80-120 | 27-DEC-18 |
| F4 (C34-C50) | | | 111.3 | | % | | 80-120 | 27-DEC-18 |
| **WG2960108-1 MB** | | | | | | | | |
| F2 (C10-C16) | | | <10 | | ug/g | | 10 | 27-DEC-18 |
| F3 (C16-C34) | | | <50 | | ug/g | | 50 | 27-DEC-18 |
| F4 (C34-C50) | | | <50 | | ug/g | | 50 | 27-DEC-18 |
| Surrogate: 2-Bromobenzotrifluoride | | | 87.0 | | % | | 60-140 | 27-DEC-18 |
| **WG2960108-5 MS** | | **WG2960108-3** | | | | | | |
| F2 (C10-C16) | | | 98.5 | | % | | 60-140 | 28-DEC-18 |
| F3 (C16-C34) | | | 95.6 | | % | | 60-140 | 28-DEC-18 |
| F4 (C34-C50) | | | 95.0 | | % | | 60-140 | 28-DEC-18 |
| **MOISTURE-WT** | **Soil** | | | | | | | |
| **Batch R4414528** | | | | | | | | |
| **WG2960190-3 DUP** | | **L2213777-8** | | | | | | |
| % Moisture | | 7.84 | 8.10 | | % | 3.2 | 20 | 25-DEC-18 |
| **WG2960190-2 LCS** | | | | | | | | |
| % Moisture | | | 100.3 | | % | | 90-110 | 25-DEC-18 |
| **WG2960190-1 MB** | | | | | | | | |
| % Moisture | | | <0.10 | | % | | 0.1 | 25-DEC-18 |
| **PAH-511-WT** | **Soil** | | | | | | | |
| **Batch R4417255** | | | | | | | | |
| **WG2959764-3 DUP** | | **WG2959764-5** | | | | | | |
| 1-Methylnaphthalene | | <0.030 | <0.030 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| 2-Methylnaphthalene | | <0.030 | <0.030 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Acenaphthene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PAH-511-WT** | **Soil** | | | | | | | |
| **Batch R4417255** | | | | | | | | |
| **WG2959764-3 DUP** | | **WG2959764-5** | | | | | | |
| Acenaphthylene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Anthracene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Benzo(a)anthracene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Benzo(a)pyrene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Benzo(b)fluoranthene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Benzo(g,h,i)perylene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Benzo(k)fluoranthene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Chrysene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Dibenzo(ah)anthracene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Fluoranthene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Fluorene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Indeno(1,2,3-cd)pyrene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Naphthalene | | <0.013 | <0.013 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Phenanthrene | | <0.046 | <0.046 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| Pyrene | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 40 | 28-DEC-18 |
| **WG2959764-2 LCS** | | | | | | | | |
| 1-Methylnaphthalene | | | 99.7 | | % | | 50-140 | 28-DEC-18 |
| 2-Methylnaphthalene | | | 95.7 | | % | | 50-140 | 28-DEC-18 |
| Acenaphthene | | | 100.3 | | % | | 50-140 | 28-DEC-18 |
| Acenaphthylene | | | 92.7 | | % | | 50-140 | 28-DEC-18 |
| Anthracene | | | 96.9 | | % | | 50-140 | 28-DEC-18 |
| Benzo(a)anthracene | | | 95.6 | | % | | 50-140 | 28-DEC-18 |
| Benzo(a)pyrene | | | 90.7 | | % | | 50-140 | 28-DEC-18 |
| Benzo(b)fluoranthene | | | 93.7 | | % | | 50-140 | 28-DEC-18 |
| Benzo(g,h,i)perylene | | | 91.3 | | % | | 50-140 | 28-DEC-18 |
| Benzo(k)fluoranthene | | | 93.8 | | % | | 50-140 | 28-DEC-18 |
| Chrysene | | | 101.1 | | % | | 50-140 | 28-DEC-18 |
| Dibenzo(ah)anthracene | | | 94.9 | | % | | 50-140 | 28-DEC-18 |
| Fluoranthene | | | 93.3 | | % | | 50-140 | 28-DEC-18 |
| Fluorene | | | 95.1 | | % | | 50-140 | 28-DEC-18 |
| Indeno(1,2,3-cd)pyrene | | | 90.7 | | % | | 50-140 | 28-DEC-18 |
| Naphthalene | | | 96.5 | | % | | 50-140 | 28-DEC-18 |
| Phenanthrene | | | 99.1 | | % | | 50-140 | 28-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PAH-511-WT** | **Soil** | | | | | | | |
| **Batch R4417255** | | | | | | | | |
| **WG2959764-2 LCS** | | | | | | | | |
| Pyrene | | | 96.0 | | % | | 50-140 | 28-DEC-18 |
| **WG2959764-1 MB** | | | | | | | | |
| 1-Methylnaphthalene | | | <0.030 | | ug/g | | 0.03 | 28-DEC-18 |
| 2-Methylnaphthalene | | | <0.030 | | ug/g | | 0.03 | 28-DEC-18 |
| Acenaphthene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Acenaphthylene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Anthracene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Benzo(a)anthracene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Benzo(a)pyrene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Benzo(b)fluoranthene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Benzo(g,h,i)perylene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Benzo(k)fluoranthene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Chrysene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Dibenzo(ah)anthracene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Fluoranthene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Fluorene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Indeno(1,2,3-cd)pyrene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Naphthalene | | | <0.013 | | ug/g | | 0.013 | 28-DEC-18 |
| Phenanthrene | | | <0.046 | | ug/g | | 0.046 | 28-DEC-18 |
| Pyrene | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| Surrogate: 2-Fluorobiphenyl | | | 108.7 | | % | | 50-140 | 28-DEC-18 |
| Surrogate: p-Terphenyl d14 | | | 106.1 | | % | | 50-140 | 28-DEC-18 |
| **WG2959764-4 MS** | | **WG2959764-5** | | | | | | |
| 1-Methylnaphthalene | | | 98.8 | | % | | 50-140 | 28-DEC-18 |
| 2-Methylnaphthalene | | | 94.4 | | % | | 50-140 | 28-DEC-18 |
| Acenaphthene | | | 99.1 | | % | | 50-140 | 28-DEC-18 |
| Acenaphthylene | | | 93.6 | | % | | 50-140 | 28-DEC-18 |
| Anthracene | | | 95.1 | | % | | 50-140 | 28-DEC-18 |
| Benzo(a)anthracene | | | 95.5 | | % | | 50-140 | 28-DEC-18 |
| Benzo(a)pyrene | | | 92.0 | | % | | 50-140 | 28-DEC-18 |
| Benzo(b)fluoranthene | | | 90.0 | | % | | 50-140 | 28-DEC-18 |
| Benzo(g,h,i)perylene | | | 98.9 | | % | | 50-140 | 28-DEC-18 |
| Benzo(k)fluoranthene | | | 86.4 | | % | | 50-140 | 28-DEC-18 |
| Chrysene | | | 98.1 | | % | | 50-140 | 28-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PAH-511-WT** | **Soil** | | | | | | | |
| **Batch R4417255** | | | | | | | | |
| **WG2959764-4 MS** | | **WG2959764-5** | | | | | | |
| Dibenzo(ah)anthracene | | | 118.4 | | % | | 50-140 | 28-DEC-18 |
| Fluoranthene | | | 90.1 | | % | | 50-140 | 28-DEC-18 |
| Fluorene | | | 94.7 | | % | | 50-140 | 28-DEC-18 |
| Indeno(1,2,3-cd)pyrene | | | 107.0 | | % | | 50-140 | 28-DEC-18 |
| Naphthalene | | | 94.6 | | % | | 50-140 | 28-DEC-18 |
| Phenanthrene | | | 97.2 | | % | | 50-140 | 28-DEC-18 |
| Pyrene | | | 93.2 | | % | | 50-140 | 28-DEC-18 |

# Quality Control Report

Workorder: L2213801 Report Date: 03-JAN-19

Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta



**Legend:**

| | |
|---|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

**Sample Parameter Qualifier Definitions:**

| Qualifier | Description |
|---|---|
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

**Hold Time Exceedances:**

All test results reported with this submission were conducted within ALS recommended hold times.

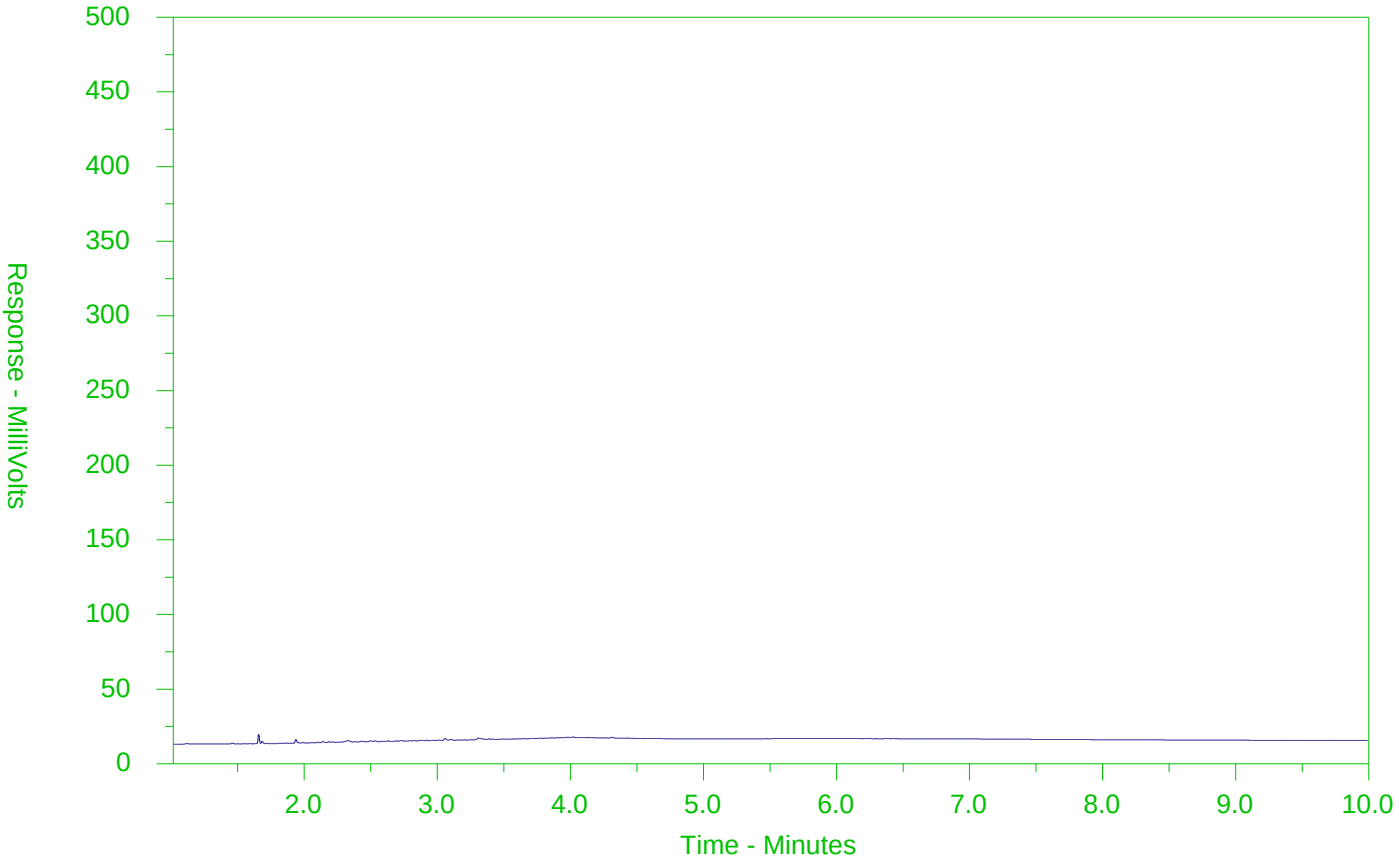
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2213801-1
Client Sample ID: BH18-1 SS6




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | | ← Motor Oils/Lube Oils/Grease → | |
| ←Diesel/Jet Fuels→ | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

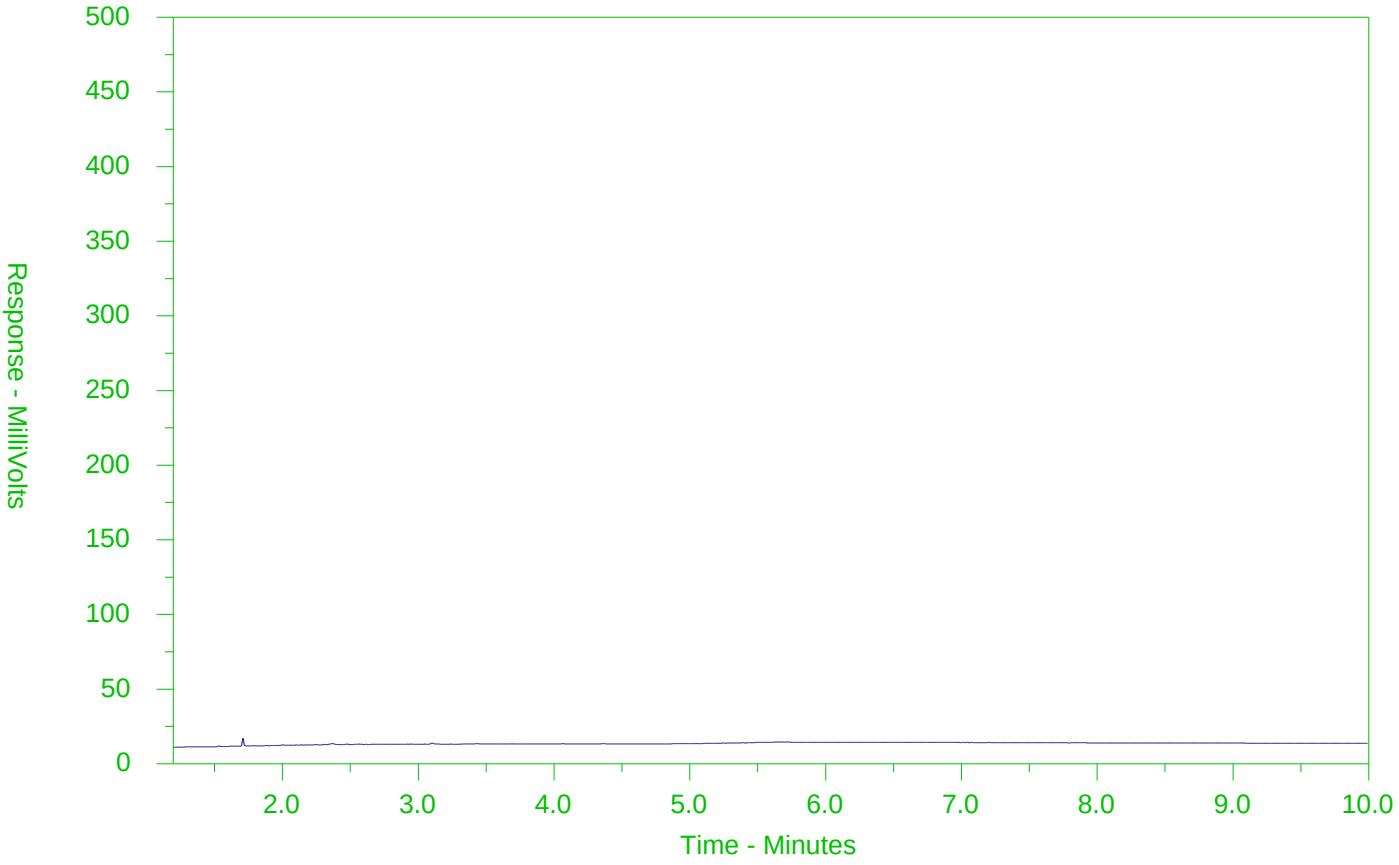
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2213801-2
Client Sample ID: BH18-7 SS4




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | | ← Motor Oils/Lube Oils/Grease → | |
| ←Diesel/Jet Fuels→ | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

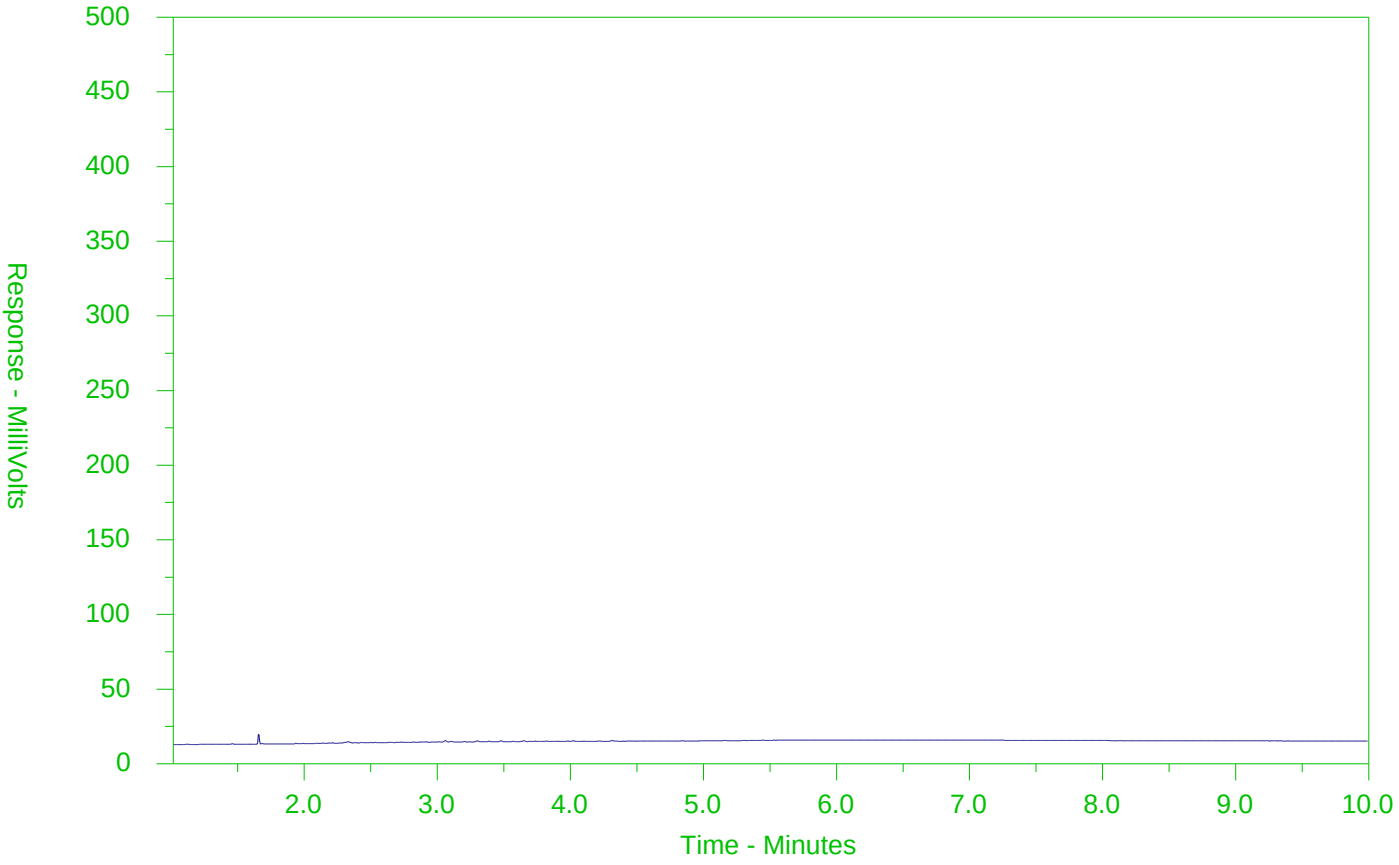
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2213801-3
Client Sample ID: BH18-9 SS3




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | | ← Motor Oils/Lube Oils/Grease → | |
| ←Diesel/Jet Fuels→ | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2213801-COFC

COC Number: 17 - 616382

Page of

| Report To | Contact and company name below will appear on the final report |
|---|---|
| Company: | DS Consultants LTD. |
| Contact: | Shafi Andreta |
| Phone: | 905 264 9393 |
| | Company address below will appear on the final report |
| Street: | C221 Highway 7 Unit 16 |
| City/Province: | Vaughan, ON |
| Postal Code: | L4H 0K8 |
| Invoice To | Same as Report To [x] YES [ ] NO |
| | Copy of Invoice with Report [x] YES [ ] NO |
| Company: | |
| Contact: | |

**Report Format / Distribution**

Select Report Format: [x] PDF [x] EXCEL [ ] EDD (DIGITAL)
Quality Control (QC) Report with Report [x] YES [ ] NO
[x] Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: [x] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax: shafi.andreta@dsconsultants.ca
Email 2: Isaac.feng@dsconsultants.ca
Email 3:

**Invoice Distribution**

Select Invoice Distribution: [x] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax:
Email 2:

**Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)**

Regular [R] [x] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] | 3 day [P3-25%] [ ] | 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E-100%] [ ] | Same Day, Weekend or Statutory holiday [E2-200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

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

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Account # / Quote #: | | AFE/Cost Center: | PO# |
| Job #: | | Major/Minor Code: | Routing Code: |
| PO / AFE: | 18-687-20 | Requisitioner: | |
| LSD: | | Location: | |
| ALS Lab Work Order # (lab use only): | L2213801 | ALS Contact: | Sampler: |

**Analysis Request**

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | PHCs + BTEX | PAHs | SAMPLES ON HOLD | Sample is hazardous (please provide further details) | NUMBER OF CONTAINERS |
|---|---|---|---|---|---|---|---|---|---|
| | BH18-1 556 | 18-12-18 | | SOIL | ✓ | | | | 4 |
| | BH18-7 554 | 20-12-18 | | | ✓ | | | | 4 |
| | BH18-9 553 | 20-12-18 | | | ✓ | | | | 4 |
| | BH18-6 551 | 19-12-18 | | | | ✓ | | | 2 |
| | BH18-5 551 | 19-12-18 | | | | ✓ | | | 2 |
| | BH18-4 552 | 19-12-18 | | | | ✓ | | | 2 |
| | DUP 3 | | | | | ✓ | | | 2 |

**Drinking Water (DW) Samples[1] (client use)**

Are samples taken from a Regulated DW System? [ ] YES [ ] NO

Are samples for human consumption/ use? [ ] YES [ ] NO

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

Table 2 RPI Coarse

**SAMPLE CONDITION AS RECEIVED (lab use only)**

Frozen [ ] | SIF Observations Yes [ ] No [ ]
Ice Packs [ ] Ice Cubes [x] | Custody seal intact Yes [ ] No [ ]
Cooling Initiated [x]

| INITIAL COOLER TEMPERATURES °C | | | | FINAL COOLER TEMPERATURES °C | | | |
|---|---|---|---|---|---|---|---|
| 15.0 °C | | | | 9.4 | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: Isaac Feng | Date: Dec 21, 2018 | Time: | Received by: RA | Date: 12/21/2018 | Time: 0134 | Received by: | Date: Dec 21/2018 | Time: 315 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JULY 2017 FRONT

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

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

DS Consultants (Vaughan)
ATTN: Shafi Andseta
6221 Highway 7
Unit 16
Vaughan ON L4H 0K8

Date Received: 21-DEC-18
Report Date: 03-JAN-19 09:26 (MT)
Version: FINAL REV. 2

Client Phone: 647-237-5110

# Certificate of Analysis

## Lab Work Order #: L2213807

Project P.O. #: 18-687-20
Job Reference:
C of C Numbers: 17-639345
Legal Site Desc:

Comments: 03-JAN-19 Revised report type to compare to Table 8 as per client request. -A.Fazekas

Amanda Fazekas
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

# ANALYTICAL REPORT

## Summary of Guideline Exceedances

| ALS ID | Client ID | Grouping | Analyte | Result | Guideline Limit | Unit |
|---|---|---|---|---|---|---|
| **Guideline** | | | | | | |
| **Ontario Regulation 153/04 - April 15, 2011 Standards - T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use** | | | | | | |
| (No parameter exceedances) | | | | | | |

# ANALYTICAL REPORT

## Physical Tests - SOIL

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lab ID | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-6 | L2213807-7 | L2213807-8 | L2213807-9 |
| | | | Sample Date | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 |
| | | | Sample ID | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | BH18-1 SS3 | BH18-2 SS2 | BH18-3 SS1 | BH18-6 SS3 |
| Analyte | Unit | Guide Limits #1 | #2 | | | | | | | | | |
| Conductivity | mS/cm | 0.7 | - | 0.164 | 0.267 | 0.148 | 0.216 | 0.113 | | | | |
| % Moisture | % | - | - | 11.2 | 11.8 | 10.4 | 18.4 | 8.08 | 10.8 | 11.4 | 16.5 | 4.85 |
| pH | pH units | - | - | 7.81 | 7.81 | 7.76 | 7.40 | 7.90 | | | | |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Physical Tests - SOIL

| | | Guide Limits | | | | |
|---|---|---|---|---|---|---|
| **Lab ID** | | | | L2213807-10 | L2213807-11 | L2213807-12 |
| **Sample Date** | | | | 20-DEC-18 | 18-DEC-18 | 18-DEC-18 |
| **Sample ID** | | | | BH18-8 SS2 | DUP1 | DUP2 |
| **Analyte** | **Unit** | **#1** | **#2** | | | |
| Conductivity | mS/cm | 0.7 | - | | 0.168 | |
| % Moisture | % | - | - | 18.7 | 10.1 | 21.5 |
| pH | pH units | - | - | | 7.80 | |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Cyanides - SOIL

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lab ID | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 |
| | | | Sample Date | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 |
| | | | Sample ID | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 |
| | | Guide Limits | | | | | | | |
| Analyte | Unit | #1 | #2 | | | | | | |
| Cyanide, Weak Acid Diss | ug/g | 0.051 | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Saturated Paste Extractables - SOIL

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | Sample Date | Sample ID | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 | |
| | | | | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 | |
| | | | | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 | |
| SAR | SAR | 5 | - | 0.30 | 0.52 | 0.15 | 0.12 | 0.22 | 0.26 | |
| Calcium (Ca) | mg/L | - | - | 21.4 | 32.3 | 24.2 | 41.5 | 14.3 | 20.6 | |
| Magnesium (Mg) | mg/L | - | - | 3.5 | 4.5 | 1.0 | 1.9 | 2.2 | 3.8 | |
| Sodium (Na) | mg/L | - | - | 5.7 | 11.8 | 2.7 | 3.0 | 3.4 | 5.0 | |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Metals - SOIL

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sample Date | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 |
| | | | | Sample ID | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 |
| Antimony (Sb) | ug/g | 1.3 | - | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Arsenic (As) | ug/g | 18 | - | | 7.1 | 5.2 | 5.9 | 4.9 | 4.2 | 5.0 |
| Barium (Ba) | ug/g | 220 | - | | 78.9 | 132 | 140 | 101 | 66.3 | 86.8 |
| Beryllium (Be) | ug/g | 2.5 | - | | 0.63 | 0.69 | 0.66 | 0.71 | 0.52 | 0.63 |
| Boron (B) | ug/g | 36 | - | | 11.3 | 10.8 | 10.8 | 5.0 | 14.9 | 11.1 |
| Boron (B), Hot Water Ext. | ug/g | 1.5 | - | | <0.10 | 0.15 | <0.10 | 0.32 | 0.19 | <0.10 |
| Cadmium (Cd) | ug/g | 1.2 | - | | <0.50 | <0.50 | <0.50 | 0.95 | <0.50 | <0.50 |
| Chromium (Cr) | ug/g | 70 | - | | 20.9 | 22.5 | 22.1 | 24.8 | 16.1 | 20.0 |
| Cobalt (Co) | ug/g | 22 | - | | 11.5 | 11.6 | 12.2 | 10.4 | 10.0 | 11.1 |
| Copper (Cu) | ug/g | 92 | - | | 24.8 | 28.9 | 27.6 | 27.7 | 15.1 | 24.3 |
| Lead (Pb) | ug/g | 120 | - | | 11.9 | 12.2 | 12.4 | 21.6 | 10.0 | 12.2 |
| Mercury (Hg) | ug/g | 0.27 | - | | 0.0165 | 0.0189 | 0.0177 | 0.0633 | 0.0070 | 0.0148 |
| Molybdenum (Mo) | ug/g | 2 | - | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Nickel (Ni) | ug/g | 82 | - | | 24.8 | 25.4 | 26.3 | 19.9 | 20.1 | 24.6 |
| Selenium (Se) | ug/g | 1.5 | - | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Silver (Ag) | ug/g | 0.5 | - | | <0.20 | <0.20 | <0.20 | 0.24 | <0.20 | <0.20 |
| Thallium (Tl) | ug/g | 1 | - | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Uranium (U) | ug/g | 2.5 | - | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Vanadium (V) | ug/g | 86 | - | | 29.6 | 30.7 | 32.2 | 33.0 | 21.9 | 28.7 |
| Zinc (Zn) | ug/g | 290 | - | | 54.8 | 60.2 | 59.3 | 95.3 | 43.9 | 54.8 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Speciated Metals - SOIL

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | Lab ID | Lab ID | Lab ID | Lab ID | Lab ID |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L2213807-1 | L2213807-2 | L2213807-3 | L2213807-4 | L2213807-5 | L2213807-11 |
| | | | | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 19-DEC-18 | 18-DEC-18 |
| | | | | BH18-1 SS2 | BH18-2 SS3 | BH18-3 SS2 | BH18-5 SS1 | BH18-6 SS2 | DUP1 |
| Chromium, Hexavalent | ug/g | 0.66 | - | <0.20 | <0.20 | 0.25 | <0.20 | <0.20 | <0.20 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Organochlorine Pesticides - SOIL

| | | | | Lab ID | L2213807-6 | L2213807-7 | L2213807-8 | L2213807-9 | L2213807-10 | L2213807-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sample Date | 18-DEC-18 | 18-DEC-18 | 18-DEC-18 | 19-DEC-18 | 20-DEC-18 | 18-DEC-18 |
| | | | | Sample ID | BH18-1 SS3 | BH18-2 SS2 | BH18-3 SS1 | BH18-6 SS3 | BH18-8 SS2 | DUP2 |
| | | Guide Limits | | | | | | | | |
| Analyte | Unit | #1 | #2 | | | | | | | |
| Aldrin | ug/g | 0.05 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| gamma-hexachlorocyclohexane | ug/g | 0.01 | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| a-chlordane | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Chlordane (Total) | ug/g | 0.05 | - | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| g-chlordane | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| op-DDD | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| pp-DDD | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Total DDD | ug/g | 0.05 | - | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| o,p-DDE | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| pp-DDE | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Total DDE | ug/g | 0.05 | - | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| op-DDT | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| pp-DDT | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Total DDT | ug/g | 1.4 | - | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Dieldrin | ug/g | 0.05 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Endosulfan I | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Endosulfan II | ug/g | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Endosulfan (Total) | ug/g | 0.04 | - | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 | <0.028 |
| Endrin | ug/g | 0.04 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Heptachlor | ug/g | 0.05 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Heptachlor Epoxide | ug/g | 0.05 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Hexachlorobenzene | ug/g | 0.02 | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobutadiene | ug/g | 0.01 | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachloroethane | ug/g | 0.01 | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Methoxychlor | ug/g | 0.05 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Surrogate: 2-Fluorobiphenyl | % | - | - | 91.0 | 91.7 | 87.2 | 89.0 | 86.6 | 87.4 |
| Surrogate: d14-Terphenyl | % | - | - | 102.9 | 102.4 | 91.6 | 97.2 | 93.1 | 98.8 |

**Guide Limit #1: T8-Soil-Res/Park/Inst/Ind/Com/Commu Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# Reference Information

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| **B-HWS-R511-WT** | Soil | Boron-HWE-O.Reg 153/04 (July 2011) | HW EXTR, EPA 6010B |

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **CHLORDANE-T-CALC-WT** | Soil | Chlordane Total sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **CN-WAD-R511-WT** | Soil | Cyanide (WAD)-O.Reg 153/04 (July 2011) | MOE 3015/APHA 4500CN I-WAD |

The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **CR-CR6-IC-WT** | Soil | Hexavalent Chromium in Soil | SW846 3060A/7199 |

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **DDD-DDE-DDT-CALC-WT** | Soil | DDD, DDE, DDT sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **EC-WT** | Soil | Conductivity (EC) | MOEE E3138 |

A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **ENDOSULFAN-T-CALC-WT** | Soil | Endosulfan Total sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **HG-200.2-CVAA-WT** | Soil | Mercury in Soil by CVAAS | EPA 200.2/1631E (mod) |

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **MET-200.2-CCMS-WT** | Soil | Metals in Soil by CRC ICPMS | EPA 200.2/6020A (mod) |

Soil/sediment is dried, disaggregated, and sieved (2 mm). For tests intended to support Ontario regulations, the <2mm fraction is ground to pass through a 0.355 mm sieve. Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al,

# Reference Information

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|

Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **MOISTURE-WT** | Soil | % Moisture | CCME PHC in Soil - Tier 1 (mod) |
| **PEST-OC-511-WT** | Soil | OC Pesticides-O.Reg 153/04 (July 2011) | SW846 8270 (511) |

Soil sample is extracted in a solvent, after extraction a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **PH-WT** | Soil | pH | MOEE E3137A |

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **SAR-R511-WT** | Soil | SAR-O.Reg 153/04 (July 2011) | SW846 6010C |

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-639345

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

| Laboratory Definition Code | Laboratory Location |
|---|---|
| WT | ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA |

# Reference Information



**GLOSSARY OF REPORT TERMS**

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*
*mg/kg - milligrams per kilogram based on dry weight of sample*
*mg/kg wwt - milligrams per kilogram based on wet weight of sample*
*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*
*mg/L - unit of concentration based on volume, parts per million.*
*< - Less than.*
*D.L. - The reporting limit.*
*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*
*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*
*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

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

# Quality Control Report

Workorder: L2213807 Report Date: 03-JAN-19 

Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **B-HWS-R511-WT** | **Soil** | | | | | | | |
| **Batch R4413548** | | | | | | | | |
| **WG2960085-4 DUP** | | **L2214042-1** | | | | | | |
| Boron (B), Hot Water Ext. | | 0.21 | 0.20 | | ug/g | 2.9 | 30 | 24-DEC-18 |
| **WG2960085-2 IRM** | | **HOTB-SAL_SOIL5** | | | | | | |
| Boron (B), Hot Water Ext. | | | 96.5 | | % | | 70-130 | 24-DEC-18 |
| **WG2960085-3 LCS** | | | | | | | | |
| Boron (B), Hot Water Ext. | | | 100.4 | | % | | 70-130 | 24-DEC-18 |
| **WG2960085-1 MB** | | | | | | | | |
| Boron (B), Hot Water Ext. | | | <0.10 | | ug/g | | 0.1 | 24-DEC-18 |
| **CN-WAD-R511-WT** | **Soil** | | | | | | | |
| **Batch R4419932** | | | | | | | | |
| **WG2960130-3 DUP** | | **L2213449-1** | | | | | | |
| Cyanide, Weak Acid Diss | | <0.050 | <0.050 | RPD-NA | ug/g | N/A | 35 | 28-DEC-18 |
| **WG2960130-2 LCS** | | | | | | | | |
| Cyanide, Weak Acid Diss | | | 96.8 | | % | | 80-120 | 28-DEC-18 |
| **WG2960130-1 MB** | | | | | | | | |
| Cyanide, Weak Acid Diss | | | <0.050 | | ug/g | | 0.05 | 28-DEC-18 |
| **WG2960130-4 MS** | | **L2213449-1** | | | | | | |
| Cyanide, Weak Acid Diss | | | 94.0 | | % | | 70-130 | 28-DEC-18 |
| **CR-CR6-IC-WT** | **Soil** | | | | | | | |
| **Batch R4417968** | | | | | | | | |
| **WG2960649-4 CRM** | | **WT-SQC012** | | | | | | |
| Chromium, Hexavalent | | | 85.8 | | % | | 70-130 | 28-DEC-18 |
| **WG2960649-3 DUP** | | **L2213785-1** | | | | | | |
| Chromium, Hexavalent | | <0.20 | <0.20 | RPD-NA | ug/g | N/A | 35 | 28-DEC-18 |
| **WG2960649-2 LCS** | | | | | | | | |
| Chromium, Hexavalent | | | 89.9 | | % | | 80-120 | 28-DEC-18 |
| **WG2960649-1 MB** | | | | | | | | |
| Chromium, Hexavalent | | | <0.20 | | ug/g | | 0.2 | 28-DEC-18 |
| **EC-WT** | **Soil** | | | | | | | |
| **Batch R4413312** | | | | | | | | |
| **WG2960083-4 DUP** | | **WG2960083-3** | | | | | | |
| Conductivity | | 0.423 | 0.410 | | mS/cm | 3.1 | 20 | 24-DEC-18 |
| **WG2960083-2 IRM** | | **WT SAR2** | | | | | | |
| Conductivity | | | 94.2 | | % | | 70-130 | 24-DEC-18 |
| **WG2960185-1 LCS** | | | | | | | | |
| Conductivity | | | 104.0 | | % | | 90-110 | 24-DEC-18 |
| **WG2960083-1 MB** | | | | | | | | |

# Quality Control Report



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6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **EC-WT** | **Soil** | | | | | | | |
| **Batch R4413312** | | | | | | | | |
| **WG2960083-1 MB** | | | | | | | | |
| Conductivity | | | <0.0040 | | mS/cm | | 0.004 | 24-DEC-18 |
| **Batch R4413316** | | | | | | | | |
| **WG2960084-4 DUP** | | **WG2960084-3** | | | | | | |
| Conductivity | | 0.131 | 0.135 | | mS/cm | 3.5 | 20 | 24-DEC-18 |
| **WG2960084-2 IRM** | | **WT SAR2** | | | | | | |
| Conductivity | | | 101.2 | | % | | 70-130 | 24-DEC-18 |
| **WG2960188-1 LCS** | | | | | | | | |
| Conductivity | | | 102.7 | | % | | 90-110 | 24-DEC-18 |
| **WG2960084-1 MB** | | | | | | | | |
| Conductivity | | | <0.0040 | | mS/cm | | 0.004 | 24-DEC-18 |
| **HG-200.2-CVAA-WT** | **Soil** | | | | | | | |
| **Batch R4415850** | | | | | | | | |
| **WG2960271-2 CRM** | | **WT-CANMET-TILL1** | | | | | | |
| Mercury (Hg) | | | 94.1 | | % | | 70-130 | 27-DEC-18 |
| **WG2960271-6 DUP** | | **WG2960271-5** | | | | | | |
| Mercury (Hg) | | 0.0220 | 0.0223 | | ug/g | 1.2 | 40 | 27-DEC-18 |
| **WG2960271-3 LCS** | | | | | | | | |
| Mercury (Hg) | | | 99.0 | | % | | 80-120 | 27-DEC-18 |
| **WG2960271-1 MB** | | | | | | | | |
| Mercury (Hg) | | | <0.0050 | | mg/kg | | 0.005 | 27-DEC-18 |
| **Batch R4419989** | | | | | | | | |
| **WG2962163-2 CRM** | | **WT-CANMET-TILL1** | | | | | | |
| Mercury (Hg) | | | 98.2 | | % | | 70-130 | 31-DEC-18 |
| **WG2962163-6 DUP** | | **WG2962163-5** | | | | | | |
| Mercury (Hg) | | 0.0339 | 0.0352 | | ug/g | 3.8 | 40 | 31-DEC-18 |
| **WG2962163-3 LCS** | | | | | | | | |
| Mercury (Hg) | | | 101.0 | | % | | 80-120 | 31-DEC-18 |
| **WG2962163-1 MB** | | | | | | | | |
| Mercury (Hg) | | | <0.0050 | | mg/kg | | 0.005 | 31-DEC-18 |
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4415870** | | | | | | | | |
| **WG2960271-2 CRM** | | **WT-CANMET-TILL1** | | | | | | |
| Antimony (Sb) | | | 113.2 | | % | | 70-130 | 27-DEC-18 |
| Arsenic (As) | | | 104.4 | | % | | 70-130 | 27-DEC-18 |
| Barium (Ba) | | | 101.2 | | % | | 70-130 | 27-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4415870** | | | | | | | | |
| **WG2960271-2 CRM** | | **WT-CANMET-TILL1** | | | | | | |
| Beryllium (Be) | | | 100.6 | | % | | 70-130 | 27-DEC-18 |
| Boron (B) | | | 3.5 | | mg/kg | | 0-8.2 | 27-DEC-18 |
| Cadmium (Cd) | | | 103.2 | | % | | 70-130 | 27-DEC-18 |
| Chromium (Cr) | | | 104.6 | | % | | 70-130 | 27-DEC-18 |
| Cobalt (Co) | | | 103.0 | | % | | 70-130 | 27-DEC-18 |
| Copper (Cu) | | | 106.0 | | % | | 70-130 | 27-DEC-18 |
| Lead (Pb) | | | 109.9 | | % | | 70-130 | 27-DEC-18 |
| Molybdenum (Mo) | | | 107.4 | | % | | 70-130 | 27-DEC-18 |
| Nickel (Ni) | | | 103.8 | | % | | 70-130 | 27-DEC-18 |
| Selenium (Se) | | | 0.35 | | mg/kg | | 0.11-0.51 | 27-DEC-18 |
| Silver (Ag) | | | 0.25 | | mg/kg | | 0.13-0.33 | 27-DEC-18 |
| Thallium (Tl) | | | 0.133 | | mg/kg | | 0.077-0.18 | 27-DEC-18 |
| Uranium (U) | | | 104.0 | | % | | 70-130 | 27-DEC-18 |
| Vanadium (V) | | | 105.5 | | % | | 70-130 | 27-DEC-18 |
| Zinc (Zn) | | | 98.8 | | % | | 70-130 | 27-DEC-18 |
| **WG2960271-6 DUP** | | **WG2960271-5** | | | | | | |
| Antimony (Sb) | | 0.11 | <0.10 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| Arsenic (As) | | 2.95 | 2.30 | | ug/g | 25 | 30 | 27-DEC-18 |
| Barium (Ba) | | 90.0 | 71.8 | | ug/g | 22 | 40 | 27-DEC-18 |
| Beryllium (Be) | | 0.49 | 0.39 | | ug/g | 21 | 30 | 27-DEC-18 |
| Boron (B) | | 5.6 | <5.0 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| Cadmium (Cd) | | <0.5 | N/A | | ug/g | <0.5 | 0.04 | 27-DEC-18 |
| Chromium (Cr) | | 20.2 | 15.7 | | ug/g | 25 | 30 | 27-DEC-18 |
| Cobalt (Co) | | 6.69 | 5.12 | | ug/g | 27 | 30 | 27-DEC-18 |
| Copper (Cu) | | 12.9 | 9.91 | | ug/g | 26 | 30 | 27-DEC-18 |
| Lead (Pb) | | 9.91 | 8.12 | | ug/g | 20 | 40 | 27-DEC-18 |
| Molybdenum (Mo) | | 0.28 | 0.23 | | ug/g | 18 | 40 | 27-DEC-18 |
| Nickel (Ni) | | 13.8 | 10.6 | | ug/g | 26 | 30 | 27-DEC-18 |
| Selenium (Se) | | <0.20 | <0.20 | RPD-NA | ug/g | N/A | 30 | 27-DEC-18 |
| Silver (Ag) | | <0.10 | <0.10 | RPD-NA | ug/g | N/A | 40 | 27-DEC-18 |
| Thallium (Tl) | | 0.129 | 0.109 | | ug/g | 17 | 30 | 27-DEC-18 |
| Uranium (U) | | 0.611 | 0.499 | | ug/g | 20 | 30 | 27-DEC-18 |
| Vanadium (V) | | 36.6 | 27.8 | | ug/g | 27 | 30 | 27-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4415870** | | | | | | | | |
| **WG2960271-6 DUP** | | **WG2960271-5** | | | | | | |
| Zinc (Zn) | | 43.7 | 34.1 | | ug/g | 25 | 30 | 27-DEC-18 |
| **WG2960271-4 LCS** | | | | | | | | |
| Antimony (Sb) | | | 104.1 | | % | | 80-120 | 27-DEC-18 |
| Arsenic (As) | | | 99.0 | | % | | 80-120 | 27-DEC-18 |
| Barium (Ba) | | | 103.9 | | % | | 80-120 | 27-DEC-18 |
| Beryllium (Be) | | | 92.9 | | % | | 80-120 | 27-DEC-18 |
| Boron (B) | | | 92.6 | | % | | 80-120 | 27-DEC-18 |
| Cadmium (Cd) | | | 98.7 | | % | | 80-120 | 27-DEC-18 |
| Chromium (Cr) | | | 98.5 | | % | | 80-120 | 27-DEC-18 |
| Cobalt (Co) | | | 98.4 | | % | | 80-120 | 27-DEC-18 |
| Copper (Cu) | | | 97.2 | | % | | 80-120 | 27-DEC-18 |
| Lead (Pb) | | | 99.3 | | % | | 80-120 | 27-DEC-18 |
| Molybdenum (Mo) | | | 102.7 | | % | | 80-120 | 27-DEC-18 |
| Nickel (Ni) | | | 97.4 | | % | | 80-120 | 27-DEC-18 |
| Selenium (Se) | | | 95.8 | | % | | 80-120 | 27-DEC-18 |
| Silver (Ag) | | | 99.8 | | % | | 80-120 | 27-DEC-18 |
| Thallium (Tl) | | | 99.0 | | % | | 80-120 | 27-DEC-18 |
| Uranium (U) | | | 100.7 | | % | | 80-120 | 27-DEC-18 |
| Vanadium (V) | | | 102.2 | | % | | 80-120 | 27-DEC-18 |
| Zinc (Zn) | | | 94.5 | | % | | 80-120 | 27-DEC-18 |
| **WG2960271-1 MB** | | | | | | | | |
| Antimony (Sb) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Arsenic (As) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Barium (Ba) | | | <0.50 | | mg/kg | | 0.5 | 27-DEC-18 |
| Beryllium (Be) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Boron (B) | | | <5.0 | | mg/kg | | 5 | 27-DEC-18 |
| Cadmium (Cd) | | | <0.020 | | mg/kg | | 0.02 | 27-DEC-18 |
| Chromium (Cr) | | | <0.50 | | mg/kg | | 0.5 | 27-DEC-18 |
| Cobalt (Co) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Copper (Cu) | | | <0.50 | | mg/kg | | 0.5 | 27-DEC-18 |
| Lead (Pb) | | | <0.50 | | mg/kg | | 0.5 | 27-DEC-18 |
| Molybdenum (Mo) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Nickel (Ni) | | | <0.50 | | mg/kg | | 0.5 | 27-DEC-18 |
| Selenium (Se) | | | <0.20 | | mg/kg | | 0.2 | 27-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4415870** | | | | | | | | |
| **WG2960271-1 MB** | | | | | | | | |
| Silver (Ag) | | | <0.10 | | mg/kg | | 0.1 | 27-DEC-18 |
| Thallium (Tl) | | | <0.050 | | mg/kg | | 0.05 | 27-DEC-18 |
| Uranium (U) | | | <0.050 | | mg/kg | | 0.05 | 27-DEC-18 |
| Vanadium (V) | | | <0.20 | | mg/kg | | 0.2 | 27-DEC-18 |
| Zinc (Zn) | | | <2.0 | | mg/kg | | 2 | 27-DEC-18 |
| **Batch R4420976** | | | | | | | | |
| **WG2962163-2 CRM** | | **WT-CANMET-TILL1** | | | | | | |
| Antimony (Sb) | | | 98.4 | | % | | 70-130 | 31-DEC-18 |
| Arsenic (As) | | | 97.7 | | % | | 70-130 | 31-DEC-18 |
| Barium (Ba) | | | 98.0 | | % | | 70-130 | 31-DEC-18 |
| Beryllium (Be) | | | 92.9 | | % | | 70-130 | 31-DEC-18 |
| Boron (B) | | | 2.8 | | mg/kg | | 0-8.2 | 31-DEC-18 |
| Cadmium (Cd) | | | 99.8 | | % | | 70-130 | 31-DEC-18 |
| Chromium (Cr) | | | 99.1 | | % | | 70-130 | 31-DEC-18 |
| Cobalt (Co) | | | 97.6 | | % | | 70-130 | 31-DEC-18 |
| Copper (Cu) | | | 100.9 | | % | | 70-130 | 31-DEC-18 |
| Lead (Pb) | | | 99.7 | | % | | 70-130 | 31-DEC-18 |
| Molybdenum (Mo) | | | 101.6 | | % | | 70-130 | 31-DEC-18 |
| Nickel (Ni) | | | 97.9 | | % | | 70-130 | 31-DEC-18 |
| Selenium (Se) | | | 0.31 | | mg/kg | | 0.11-0.51 | 31-DEC-18 |
| Silver (Ag) | | | 0.22 | | mg/kg | | 0.13-0.33 | 31-DEC-18 |
| Thallium (Tl) | | | 0.125 | | mg/kg | | 0.077-0.18 | 31-DEC-18 |
| Uranium (U) | | | 102.8 | | % | | 70-130 | 31-DEC-18 |
| Vanadium (V) | | | 97.7 | | % | | 70-130 | 31-DEC-18 |
| Zinc (Zn) | | | 99.9 | | % | | 70-130 | 31-DEC-18 |
| **WG2962163-6 DUP** | | **WG2962163-5** | | | | | | |
| Antimony (Sb) | | 0.13 | 0.14 | | ug/g | 13 | 30 | 31-DEC-18 |
| Arsenic (As) | | 4.64 | 5.10 | | ug/g | 9.6 | 30 | 31-DEC-18 |
| Barium (Ba) | | 84.4 | 92.9 | | ug/g | 9.7 | 40 | 31-DEC-18 |
| Beryllium (Be) | | 0.68 | 0.80 | | ug/g | 16 | 30 | 31-DEC-18 |
| Boron (B) | | 5.2 | 6.2 | | ug/g | 17 | 30 | 31-DEC-18 |
| Cadmium (Cd) | | 0.158 | 0.187 | | ug/g | 17 | 30 | 31-DEC-18 |
| Chromium (Cr) | | 25.0 | 27.5 | | ug/g | 9.4 | 30 | 31-DEC-18 |
| Cobalt (Co) | | 11.7 | 13.0 | | ug/g | 11 | 30 | 31-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4420976** | | | | | | | | |
| **WG2962163-6 DUP** | | **WG2962163-5** | | | | | | |
| Copper (Cu) | | 24.2 | 26.6 | | ug/g | 9.2 | 30 | 31-DEC-18 |
| Lead (Pb) | | 13.1 | 14.7 | | ug/g | 12 | 40 | 31-DEC-18 |
| Molybdenum (Mo) | | 0.34 | 0.40 | | ug/g | 17 | 40 | 31-DEC-18 |
| Nickel (Ni) | | 25.1 | 27.9 | | ug/g | 11 | 30 | 31-DEC-18 |
| Selenium (Se) | | <0.20 | 0.21 | RPD-NA | ug/g | N/A | 30 | 31-DEC-18 |
| Silver (Ag) | | <0.10 | <0.10 | RPD-NA | ug/g | N/A | 40 | 31-DEC-18 |
| Thallium (Tl) | | 0.162 | 0.185 | | ug/g | 13 | 30 | 31-DEC-18 |
| Uranium (U) | | 0.602 | 0.667 | | ug/g | 10 | 30 | 31-DEC-18 |
| Vanadium (V) | | 35.4 | 39.9 | | ug/g | 12 | 30 | 31-DEC-18 |
| Zinc (Zn) | | 62.2 | 70.6 | | ug/g | 13 | 30 | 31-DEC-18 |
| **WG2962163-4 LCS** | | | | | | | | |
| Antimony (Sb) | | | 104.2 | | % | | 80-120 | 31-DEC-18 |
| Arsenic (As) | | | 100.5 | | % | | 80-120 | 31-DEC-18 |
| Barium (Ba) | | | 105.8 | | % | | 80-120 | 31-DEC-18 |
| Beryllium (Be) | | | 94.3 | | % | | 80-120 | 31-DEC-18 |
| Boron (B) | | | 95.4 | | % | | 80-120 | 31-DEC-18 |
| Cadmium (Cd) | | | 101.8 | | % | | 80-120 | 31-DEC-18 |
| Chromium (Cr) | | | 99.2 | | % | | 80-120 | 31-DEC-18 |
| Cobalt (Co) | | | 98.5 | | % | | 80-120 | 31-DEC-18 |
| Copper (Cu) | | | 98.6 | | % | | 80-120 | 31-DEC-18 |
| Lead (Pb) | | | 97.9 | | % | | 80-120 | 31-DEC-18 |
| Molybdenum (Mo) | | | 101.5 | | % | | 80-120 | 31-DEC-18 |
| Nickel (Ni) | | | 99.2 | | % | | 80-120 | 31-DEC-18 |
| Selenium (Se) | | | 104.9 | | % | | 80-120 | 31-DEC-18 |
| Silver (Ag) | | | 99.0 | | % | | 80-120 | 31-DEC-18 |
| Thallium (Tl) | | | 96.9 | | % | | 80-120 | 31-DEC-18 |
| Uranium (U) | | | 99.5 | | % | | 80-120 | 31-DEC-18 |
| Vanadium (V) | | | 102.2 | | % | | 80-120 | 31-DEC-18 |
| Zinc (Zn) | | | 97.7 | | % | | 80-120 | 31-DEC-18 |
| **WG2962163-1 MB** | | | | | | | | |
| Antimony (Sb) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |
| Arsenic (As) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |
| Barium (Ba) | | | <0.50 | | mg/kg | | 0.5 | 31-DEC-18 |
| Beryllium (Be) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-200.2-CCMS-WT** | **Soil** | | | | | | | |
| **Batch R4420976** | | | | | | | | |
| **WG2962163-1 MB** | | | | | | | | |
| Boron (B) | | | <5.0 | | mg/kg | | 5 | 31-DEC-18 |
| Cadmium (Cd) | | | <0.020 | | mg/kg | | 0.02 | 31-DEC-18 |
| Chromium (Cr) | | | <0.50 | | mg/kg | | 0.5 | 31-DEC-18 |
| Cobalt (Co) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |
| Copper (Cu) | | | <0.50 | | mg/kg | | 0.5 | 31-DEC-18 |
| Lead (Pb) | | | <0.50 | | mg/kg | | 0.5 | 31-DEC-18 |
| Molybdenum (Mo) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |
| Nickel (Ni) | | | <0.50 | | mg/kg | | 0.5 | 31-DEC-18 |
| Selenium (Se) | | | <0.20 | | mg/kg | | 0.2 | 31-DEC-18 |
| Silver (Ag) | | | <0.10 | | mg/kg | | 0.1 | 31-DEC-18 |
| Thallium (Tl) | | | <0.050 | | mg/kg | | 0.05 | 31-DEC-18 |
| Uranium (U) | | | <0.050 | | mg/kg | | 0.05 | 31-DEC-18 |
| Vanadium (V) | | | <0.20 | | mg/kg | | 0.2 | 31-DEC-18 |
| Zinc (Zn) | | | <2.0 | | mg/kg | | 2 | 31-DEC-18 |
| **MOISTURE-WT** | **Soil** | | | | | | | |
| **Batch R4414527** | | | | | | | | |
| **WG2960233-3 DUP** | | **L2214024-1** | | | | | | |
| % Moisture | | 18.9 | 19.6 | | % | 3.4 | 20 | 25-DEC-18 |
| **WG2960233-2 LCS** | | | | | | | | |
| % Moisture | | | 100.0 | | % | | 90-110 | 25-DEC-18 |
| **WG2960233-1 MB** | | | | | | | | |
| % Moisture | | | <0.10 | | % | | 0.1 | 25-DEC-18 |
| **Batch R4414528** | | | | | | | | |
| **WG2960190-3 DUP** | | **L2213777-8** | | | | | | |
| % Moisture | | 7.84 | 8.10 | | % | 3.2 | 20 | 25-DEC-18 |
| **WG2960190-2 LCS** | | | | | | | | |
| % Moisture | | | 100.3 | | % | | 90-110 | 25-DEC-18 |
| **WG2960190-1 MB** | | | | | | | | |
| % Moisture | | | <0.10 | | % | | 0.1 | 25-DEC-18 |
| **PEST-OC-511-WT** | **Soil** | | | | | | | |
| **Batch R4422268** | | | | | | | | |
| **WG2960788-3 DUP** | | **WG2960788-5** | | | | | | |
| Aldrin | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| a-chlordane | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| g-chlordane | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PEST-OC-511-WT** | **Soil** | | | | | | | |
| **Batch R4422268** | | | | | | | | |
| **WG2960788-3 DUP** | | **WG2960788-5** | | | | | | |
| op-DDD | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| pp-DDD | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| o,p-DDE | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| pp-DDE | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| op-DDT | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| pp-DDT | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Dieldrin | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Endosulfan I | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Endosulfan II | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Endrin | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| gamma-hexachlorocyclohexane | | <0.010 | <0.010 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Heptachlor | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Heptachlor Epoxide | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Hexachlorobenzene | | <0.010 | <0.010 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Hexachlorobutadiene | | <0.010 | <0.010 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Hexachloroethane | | <0.010 | <0.010 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| Methoxychlor | | <0.020 | <0.020 | RPD-NA | ug/g | N/A | 40 | 02-JAN-19 |
| **WG2960788-2 LCS** | | | | | | | | |
| Aldrin | | | 96.4 | | % | | 50-140 | 02-JAN-19 |
| a-chlordane | | | 86.5 | | % | | 50-140 | 02-JAN-19 |
| g-chlordane | | | 88.9 | | % | | 50-140 | 02-JAN-19 |
| op-DDD | | | 93.8 | | % | | 50-140 | 02-JAN-19 |
| pp-DDD | | | 93.3 | | % | | 50-140 | 02-JAN-19 |
| o,p-DDE | | | 93.8 | | % | | 50-140 | 02-JAN-19 |
| pp-DDE | | | 92.3 | | % | | 50-140 | 02-JAN-19 |
| op-DDT | | | 83.5 | | % | | 50-140 | 02-JAN-19 |
| pp-DDT | | | 86.8 | | % | | 50-140 | 02-JAN-19 |
| Dieldrin | | | 100.2 | | % | | 50-140 | 02-JAN-19 |
| Endosulfan I | | | 92.0 | | % | | 50-140 | 02-JAN-19 |
| Endosulfan II | | | 91.5 | | % | | 50-140 | 02-JAN-19 |
| Endrin | | | 87.3 | | % | | 50-140 | 02-JAN-19 |
| gamma-hexachlorocyclohexane | | | 84.3 | | % | | 50-140 | 02-JAN-19 |
| Heptachlor | | | 75.2 | | % | | 50-140 | 02-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PEST-OC-511-WT** | **Soil** | | | | | | | |
| **Batch R4422268** | | | | | | | | |
| **WG2960788-2 LCS** | | | | | | | | |
| Heptachlor Epoxide | | | 84.9 | | % | | 50-140 | 02-JAN-19 |
| Hexachlorobenzene | | | 85.2 | | % | | 50-140 | 02-JAN-19 |
| Hexachlorobutadiene | | | 86.3 | | % | | 50-140 | 02-JAN-19 |
| Hexachloroethane | | | 90.5 | | % | | 50-140 | 02-JAN-19 |
| Methoxychlor | | | 94.6 | | % | | 50-140 | 02-JAN-19 |
| **WG2960788-1 MB** | | | | | | | | |
| Aldrin | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| a-chlordane | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| g-chlordane | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| op-DDD | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| pp-DDD | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| o,p-DDE | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| pp-DDE | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| op-DDT | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| pp-DDT | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Dieldrin | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Endosulfan I | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Endosulfan II | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Endrin | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| gamma-hexachlorocyclohexane | | | <0.010 | | ug/g | | 0.01 | 02-JAN-19 |
| Heptachlor | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Heptachlor Epoxide | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Hexachlorobenzene | | | <0.010 | | ug/g | | 0.01 | 02-JAN-19 |
| Hexachlorobutadiene | | | <0.010 | | ug/g | | 0.01 | 02-JAN-19 |
| Hexachloroethane | | | <0.010 | | ug/g | | 0.01 | 02-JAN-19 |
| Methoxychlor | | | <0.020 | | ug/g | | 0.02 | 02-JAN-19 |
| Surrogate: 2-Fluorobiphenyl | | | 99.7 | | % | | 50-140 | 02-JAN-19 |
| Surrogate: d14-Terphenyl | | | 105.6 | | % | | 50-140 | 02-JAN-19 |
| **WG2960788-4 MS** | | **WG2960788-5** | | | | | | |
| Aldrin | | | 97.3 | | % | | 50-140 | 02-JAN-19 |
| a-chlordane | | | 85.1 | | % | | 50-140 | 02-JAN-19 |
| g-chlordane | | | 86.5 | | % | | 50-140 | 02-JAN-19 |
| op-DDD | | | 95.5 | | % | | 50-140 | 02-JAN-19 |
| pp-DDD | | | 97.9 | | % | | 50-140 | 02-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PEST-OC-511-WT** | **Soil** | | | | | | | |
| **Batch R4422268** | | | | | | | | |
| **WG2960788-4 MS** | | **WG2960788-5** | | | | | | |
| o,p-DDE | | | 93.6 | | % | | 50-140 | 02-JAN-19 |
| pp-DDE | | | 91.6 | | % | | 50-140 | 02-JAN-19 |
| op-DDT | | | 83.4 | | % | | 50-140 | 02-JAN-19 |
| pp-DDT | | | 82.2 | | % | | 50-140 | 02-JAN-19 |
| Dieldrin | | | 101.0 | | % | | 50-140 | 02-JAN-19 |
| Endosulfan I | | | 92.5 | | % | | 50-140 | 02-JAN-19 |
| Endosulfan II | | | 94.7 | | % | | 50-140 | 02-JAN-19 |
| Endrin | | | 94.3 | | % | | 50-140 | 02-JAN-19 |
| gamma-hexachlorocyclohexane | | | 85.4 | | % | | 50-140 | 02-JAN-19 |
| Heptachlor | | | 75.6 | | % | | 50-140 | 02-JAN-19 |
| Heptachlor Epoxide | | | 84.2 | | % | | 50-140 | 02-JAN-19 |
| Hexachlorobenzene | | | 84.9 | | % | | 50-140 | 02-JAN-19 |
| Hexachlorobutadiene | | | 85.5 | | % | | 50-140 | 02-JAN-19 |
| Hexachloroethane | | | 87.2 | | % | | 50-140 | 02-JAN-19 |
| Methoxychlor | | | 98.4 | | % | | 50-140 | 02-JAN-19 |
| **PH-WT** | **Soil** | | | | | | | |
| **Batch R4415291** | | | | | | | | |
| **WG2960403-1 DUP** | | **L2214042-4** | | | | | | |
| pH | | 7.55 | 7.49 | J | pH units | 0.06 | 0.3 | 27-DEC-18 |
| **WG2960693-1 LCS** | | | | | | | | |
| pH | | | 6.99 | | pH units | | 6.9-7.1 | 27-DEC-18 |
| **Batch R4415512** | | | | | | | | |
| **WG2960677-1 DUP** | | **L2213785-1** | | | | | | |
| pH | | 7.57 | 7.58 | J | pH units | 0.01 | 0.3 | 27-DEC-18 |
| **WG2960869-1 LCS** | | | | | | | | |
| pH | | | 6.99 | | pH units | | 6.9-7.1 | 27-DEC-18 |
| **SAR-R511-WT** | **Soil** | | | | | | | |
| **Batch R4413847** | | | | | | | | |
| **WG2960083-4 DUP** | | **WG2960083-3** | | | | | | |
| Calcium (Ca) | | 30.9 | 30.2 | | mg/L | 2.5 | 30 | 24-DEC-18 |
| Sodium (Na) | | 42.7 | 40.5 | | mg/L | 5.5 | 30 | 24-DEC-18 |
| Magnesium (Mg) | | 1.4 | 1.3 | | mg/L | 7.1 | 30 | 24-DEC-18 |
| **WG2960083-2 IRM** | | **WT SAR2** | | | | | | |
| Calcium (Ca) | | | 87.4 | | % | | 70-130 | 24-DEC-18 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **SAR-R511-WT** | **Soil** | | | | | | | |
| **Batch R4413847** | | | | | | | | |
| **WG2960083-2 IRM** | | **WT SAR2** | | | | | | |
| Sodium (Na) | | | 85.3 | | % | | 70-130 | 24-DEC-18 |
| Magnesium (Mg) | | | 89.4 | | % | | 70-130 | 24-DEC-18 |
| **WG2960083-1 MB** | | | | | | | | |
| Calcium (Ca) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |
| Sodium (Na) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |
| Magnesium (Mg) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |
| **Batch R4415489** | | | | | | | | |
| **WG2960084-4 DUP** | | **WG2960084-3** | | | | | | |
| Calcium (Ca) | | 6.6 | 6.5 | | mg/L | 1.8 | 30 | 24-DEC-18 |
| Sodium (Na) | | 20.1 | 20.7 | | mg/L | 3.3 | 30 | 24-DEC-18 |
| Magnesium (Mg) | | <1.0 | <1.0 | RPD-NA | mg/L | N/A | 30 | 24-DEC-18 |
| **WG2960084-2 IRM** | | **WT SAR2** | | | | | | |
| Calcium (Ca) | | | 95.5 | | % | | 70-130 | 24-DEC-18 |
| Sodium (Na) | | | 90.6 | | % | | 70-130 | 24-DEC-18 |
| Magnesium (Mg) | | | 96.5 | | % | | 70-130 | 24-DEC-18 |
| **WG2960084-1 MB** | | | | | | | | |
| Calcium (Ca) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |
| Sodium (Na) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |
| Magnesium (Mg) | | | <1.0 | | mg/L | | 1 | 24-DEC-18 |

# Quality Control Report

Workorder: L2213807 Report Date: 03-JAN-19

Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta



**Legend:**

| | |
|---|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

**Sample Parameter Qualifier Definitions:**

| Qualifier | Description |
|---|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

**Hold Time Exceedances:**

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2213807-COFC

COC Number: 17 - 639345

Page of

| Report To | Contact and company name below will appear on the final report | Report Format / Distribution | Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) |
|---|---|---|---|
| Company: | QS Consultants LTD | Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL) | Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply |
| Contact: | Shafi Andleeb | Quality Control (QC) Report with Report ☑ YES ☐ NO | PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐ |
| Phone: | 905 264 9393 | ☑ Compare Results to Criteria on Report - provide details below if box checked | EMERGENCY: 1 Business day [E-100%] ☐ / Same Day, Weekend or Statutory holiday [E2-200% (Laboratory opening fees may apply)] ☐ |
| | Company address below will appear on the final report | Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX | Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm |
| Street: | 6221 Highway 7, Unit 16 | Email 1 or Fax: Shafi.andleeb@qsconsultants.ca | For tests that can not be performed according to the service level selected, you will be contacted. |
| City/Province: | Vaughan, ON | Email 2: Isaac.feng@qsconsultants.ca | |
| Postal Code: | L4H 0K8 | Email 3 | |
| **Invoice To** | Same as Report To ☑ YES ☐ NO | **Invoice Distribution** | |
| | Copy of Invoice with Report ☑ YES ☐ NO | Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX | |
| Company: | | Email 1 or Fax | |
| Contact: | | Email 2 | |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Account # / Quote #: | | AFE/Cost Center: | PO# |
| Job #: | | Major/Minor Code: | Routing Code: |
| PO / AFE: | 18-687-20 | Requisitioner: | |
| LSD: | | Location: | |
| ALS Lab Work Order # (lab use only): | L2213807 | ALS Contact: | Sampler: |

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | Metals + Inorganics | OC pesticides | SAMPLES ON HOLD | Sample is hazardous (please provide further details) | NUMBER OF CONTAINERS |
|---|---|---|---|---|---|---|---|---|---|
| | BH18-1 SS2 | 18-12-18 | | SOIL | ✓ | | | | 2 |
| | BH18-2 SS3 | 18-12-18 | | | ✓ | | | | 2 |
| | BH18-3 SS2 | 18-12-18 | | | ✓ | | | | 2 |
| | BH18-5 SS1 | 19-12-18 | | | ✓ | | | | 2 |
| | BH18-6 SS2 | 19-12-18 | | | ✓ | | | | 2 |
| | BH18-1 SS3 | 18-12-18 | | | | ✓ | | | 2 |
| | BH18-2 SS2 | 18-12-18 | | | | ✓ | | | 2 |
| | BH18-3 SS1 | 18-12-18 | | | | ✓ | | | 2 |
| | BH18-6 SS3 | 19-12-18 | | | | ✓ | | | 2 |
| | BH18-8 SS2 | 20-12-18 | | | | ✓ | | | 2 |
| | DUP1 | | | | ✓ | ✓ | | | 2 |
| | DUP2 | | | | | ✓ | | | 2 |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☐ NO | Table 2 Residential Coarse |
| Are samples for human consumption/ use? ☐ YES ☐ NO | |

SAMPLE CONDITION AS RECEIVED (lab use only)

| | | | | | |
|---|---|---|---|---|---|
| Frozen | ☐ | SIF Observations | Yes ☐ | No | ☐ |
| Ice Packs | ☐ | Ice Cubes ☒ | Custody seal intact | Yes ☐ | No ☐ |
| Cooling Initiated | ☑ | | | | |

| INITIAL COOLER TEMPERATURES °C | | | FINAL COOLER TEMPERATURES °C | | |
|---|---|---|---|---|---|
| 15.0 | | | 7.4 | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: Isaac Feng | Date: Dec 21, 2018 | Time: | Received by: | Date: 12/21/2018 | Time: 9:34 | Received by: | Date: Dec 21/2018 | Time: 5:15 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JULY 2017 FRONT

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

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

DS Consultants (Vaughan)
ATTN: Shafi Andseta
6221 Highway 7
Unit 16
Vaughan ON L4H 0K8

Date Received: 08-JAN-19
Report Date: 15-JAN-19 14:58 (MT)
Version: FINAL

Client Phone: 647-237-5110

# Certificate of Analysis

## Lab Work Order #: L2217334

Project P.O. #: 18-687-20
Job Reference:
C of C Numbers: 17-639700
Legal Site Desc:

Amanda Fazekas
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

# ANALYTICAL REPORT

## Summary of Guideline Exceedances

| ALS ID | Client ID | Grouping | Analyte | Result | Guideline Limit | Unit | Guideline |
|---|---|---|---|---|---|---|---|

**Ontario Regulation 153/04 - April 15, 2011 Standards - T8-Ground Water - All Types of Property Use**

(No parameter exceedances)

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Physical Tests - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | Sample Date | Sample ID | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 | L2217334-6 | L2217334-7 | L2217334-10 |
| | | | | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | | | BH18-1 | BH18-2 | BH18-4 | BH18-6 | BH18-7 | BH18-9 | DUP3 |
| Conductivity | mS/cm | - | - | 1.16 | 0.848 | 1.15 | 0.631 | 1.23 | 1.07 | 1.21 |
| pH | pH units | - | - | 7.64 | 7.72 | 7.57 | 7.84 | 7.58 | 7.60 | 7.55 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Anions and Nutrients - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | Sample Date | Sample ID | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 | L2217334-6 | L2217334-7 | L2217334-10 |
| | | | | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | | | BH18-1 | BH18-2 | BH18-4 | BH18-6 | BH18-7 | BH18-9 | DUP3 |
| Chloride (Cl) | mg/L | 790 | - | 37.8 | 7.79 | 132 | 28.6 | 129 | 87.1 | 130 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# ANALYTICAL REPORT

## Cyanides - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 | L2217334-6 | L2217334-7 | L2217334-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sample Date | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | | | Sample ID | BH18-1 | BH18-2 | BH18-4 | BH18-6 | BH18-7 | BH18-9 | DUP3 |
| Cyanide, Weak Acid Diss | ug/L | 52 | - | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Dissolved Metals - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 | L2217334-6 | L2217334-7 | L2217334-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sample Date | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | | | Sample ID | BH18-1 | BH18-2 | BH18-4 | BH18-6 | BH18-7 | BH18-9 | DUP3 |
| Dissolved Mercury Filtration Location | | - | - | | FIELD | LAB | LAB | LAB | LAB | LAB | LAB |
| Dissolved Metals Filtration Location | | - | - | | FIELD | LAB | LAB | LAB | LAB | LAB | LAB |
| Antimony (Sb)-Dissolved | ug/L | 6 | - | | 0.33 | 0.13 | 0.17 | 0.16 | 0.22 | 0.21 | 0.20 |
| Arsenic (As)-Dissolved | ug/L | 25 | - | | 3.60 | 0.61 | 0.55 | 0.79 | 1.38 | 1.07 | 1.48 |
| Barium (Ba)-Dissolved | ug/L | 1000 | - | | 76.0 | 67.3 | 108 | 74.1 | 93.3 | 91.1 | 93.6 |
| Beryllium (Be)-Dissolved | ug/L | 4 | - | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Boron (B)-Dissolved | ug/L | 5000 | - | | 265 | 115 | 134 | 135 | 500 | 175 | 494 |
| Cadmium (Cd)-Dissolved | ug/L | 2.1 | - | | 0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Chromium (Cr)-Dissolved | ug/L | 50 | - | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Cobalt (Co)-Dissolved | ug/L | 3.8 | - | | 0.24 | 0.12 | 0.19 | <0.10 | 0.43 | 0.23 | 0.45 |
| Copper (Cu)-Dissolved | ug/L | 69 | - | | 1.14 | 0.41 | 0.45 | 0.76 | 0.96 | 1.11 | 1.00 |
| Lead (Pb)-Dissolved | ug/L | 10 | - | | 0.139 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Mercury (Hg)-Dissolved | ug/L | 0.29 | - | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Molybdenum (Mo)-Dissolved | ug/L | 70 | - | | 22.7 | 6.03 | 6.72 | 4.70 | 7.84 | 9.51 | 7.73 |
| Nickel (Ni)-Dissolved | ug/L | 100 | - | | 1.56 | 0.85 | 0.86 | 0.54 | 1.41 | 1.22 | 1.50 |
| Selenium (Se)-Dissolved | ug/L | 10 | - | | 0.285 | 0.693 | 0.088 | 0.111 | 0.241 | 0.163 | 0.229 |
| Silver (Ag)-Dissolved | ug/L | 1.2 | - | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Sodium (Na)-Dissolved | ug/L | 490000 | - | | 29000 | 17600 | 44900 | 14100 | 41800 | 38300 | 41300 |
| Thallium (Tl)-Dissolved | ug/L | 2 | - | | 0.027 | 0.016 | 0.025 | 0.013 | 0.016 | 0.028 | 0.016 |
| Uranium (U)-Dissolved | ug/L | 20 | - | | 7.77 | 4.86 | 2.14 | 2.51 | 11.3 | 3.26 | 11.3 |
| Vanadium (V)-Dissolved | ug/L | 6.2 | - | | 2.12 | 0.63 | 0.81 | 1.02 | 1.19 | 1.13 | 1.24 |
| Zinc (Zn)-Dissolved | ug/L | 890 | - | | 6.6 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Speciated Metals - WATER

| | | Lab ID | L2217334-1 | L2217334-2 | L2217334-3 | L2217334-5 | L2217334-6 | L2217334-7 | L2217334-10 |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | Sample ID | BH18-1 | BH18-2 | BH18-4 | BH18-6 | BH18-7 | BH18-9 | DUP3 |
| Analyte | Unit | Guide Limits #1 | #2 | | | | | | |
| Chromium, Hexavalent | ug/L | 25 | - | <0.50 | <0.50 RRR | <0.50 RRR | <0.50 RRR | <0.50 RRR | <0.50 RRR | <0.50 RRR |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Volatile Organic Compounds - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID | L2217334-1 | L2217334-6 | L2217334-7 | L2217334-11 | L2217334-12 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sample Date | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | | | Sample ID | BH18-1 | BH18-7 | BH18-9 | DUP4 | TRIP BLANK |
| Acetone | ug/L | 2700 | - | | <30 OWP | <30 OWP | <30 OWP | <30 OWP | <30 |
| Benzene | ug/L | 5 | - | | <0.50 OWP | 0.60 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Bromodichloromethane | ug/L | 16 | - | | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 |
| Bromoform | ug/L | 25 | - | | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 |
| Bromomethane | ug/L | 0.89 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Carbon tetrachloride | ug/L | 0.79 | - | | <0.20 OWP | <0.20 OWP | <0.20 OWP | <0.20 OWP | <0.20 |
| Chlorobenzene | ug/L | 30 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Dibromochloromethane | ug/L | 25 | - | | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 |
| Chloroform | ug/L | 2.4 | - | | <1.0 OWP | <1.0 OWP | <1.0 OWP | <1.0 OWP | <1.0 |
| 1,2-Dibromoethane | ug/L | 0.2 | - | | <0.20 OWP | <0.20 OWP | <0.20 OWP | <0.20 OWP | <0.20 |
| 1,2-Dichlorobenzene | ug/L | 3 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,3-Dichlorobenzene | ug/L | 59 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,4-Dichlorobenzene | ug/L | 1 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Dichlorodifluoromethane | ug/L | 590 | - | | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 |
| 1,1-Dichloroethane | ug/L | 5 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,2-Dichloroethane | ug/L | 1.6 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,1-Dichloroethylene | ug/L | 1.6 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| cis-1,2-Dichloroethylene | ug/L | 1.6 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| trans-1,2-Dichloroethylene | ug/L | 1.6 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Methylene Chloride | ug/L | 50 | - | | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 |
| 1,2-Dichloropropane | ug/L | 5 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| cis-1,3-Dichloropropene | ug/L | - | - | | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 |
| trans-1,3-Dichloropropene | ug/L | - | - | | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 |
| 1,3-Dichloropropene (cis & trans) | ug/L | 0.5 | - | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Ethylbenzene | ug/L | 2.4 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| n-Hexane | ug/L | 51 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Methyl Ethyl Ketone | ug/L | 1800 | - | | <20 OWP | <20 OWP | <20 OWP | <20 OWP | <20 |
| Methyl Isobutyl Ketone | ug/L | 640 | - | | <20 OWP | <20 OWP | <20 OWP | <20 OWP | <20 |
| MTBE | ug/L | 15 | - | | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 OWP | <2.0 |
| Styrene | ug/L | 5.4 | - | | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Volatile Organic Compounds - WATER

| Analyte | Unit | Guide Limits #1 | Guide Limits #2 | Lab ID: L2217334-1 Sample Date: 07-JAN-19 Sample ID: BH18-1 | Lab ID: L2217334-6 Sample Date: 07-JAN-19 Sample ID: BH18-7 | Lab ID: L2217334-7 Sample Date: 07-JAN-19 Sample ID: BH18-9 | Lab ID: L2217334-11 Sample Date: 07-JAN-19 Sample ID: DUP4 | Lab ID: L2217334-12 Sample Date: 07-JAN-19 Sample ID: TRIP BLANK |
|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ug/L | 1.1 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,1,2,2-Tetrachloroethane | ug/L | 1 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Tetrachloroethylene | ug/L | 1.6 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Toluene | ug/L | 22 | - | <0.50 OWP | 0.52 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,1,1-Trichloroethane | ug/L | 200 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| 1,1,2-Trichloroethane | ug/L | 4.7 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Trichloroethylene | ug/L | 1.6 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| Trichlorofluoromethane | ug/L | 150 | - | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 OWP | <5.0 |
| Vinyl chloride | ug/L | 0.5 | - | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 OWP | <0.50 |
| o-Xylene | ug/L | - | - | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 OWP | <0.30 |
| m+p-Xylenes | ug/L | - | - | <0.40 OWP | <0.40 OWP | <0.40 OWP | <0.40 OWP | <0.40 |
| Xylenes (Total) | ug/L | 300 | - | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Surrogate: 4-Bromofluorobenzene | % | - | - | 97.7 | 98.5 | 99.6 | 98.7 | 100.0 |
| Surrogate: 1,4-Difluorobenzene | % | - | - | 102.1 | 102.2 | 101.6 | 101.2 | 100.9 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Hydrocarbons - WATER

| | | Guide Limits | | | | | |
|---|---|---|---|---|---|---|---|
| Lab ID | | | | L2217334-1 | L2217334-6 | L2217334-7 | L2217334-11 |
| Sample Date | | | | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| Sample ID | | | | BH18-1 | BH18-7 | BH18-9 | DUP4 |
| Analyte | Unit | #1 | #2 | | | | |
| F1 (C6-C10) | ug/L | 420 | - | <25 OWP | <25 OWP | <25 OWP | <25 OWP |
| F1-BTEX | ug/L | 420 | - | <25 | <25 | <25 | <25 |
| F2 (C10-C16) | ug/L | 150 | - | <100 | <100 OWP | <100 | <100 |
| F3 (C16-C34) | ug/L | 500 | - | <250 | <250 OWP | <250 | <250 |
| F4 (C34-C50) | ug/L | 500 | - | <250 | <250 OWP | <250 | <250 |
| Total Hydrocarbons (C6-C50) | ug/L | - | - | <370 | <370 | <370 | <370 |
| Chrom. to baseline at nC50 | | - | - | YES | YES | YES | YES |
| Surrogate: 2-Bromobenzotrifluoride | % | - | - | 109.7 | 110.5 | 111.2 | 108.0 |
| Surrogate: 3,4-Dichlorotoluene | % | - | - | 99.5 | 91.6 | 99.5 | 97.7 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Polycyclic Aromatic Hydrocarbons - WATER

| | | Guide Limits | | | | | |
|---|---|---|---|---|---|---|---|
| **Lab ID** | | | | L2217334-3 | L2217334-4 | L2217334-5 | L2217334-9 |
| **Sample Date** | | | | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| **Sample ID** | | | | BH18-4 | BH18-5 | BH18-6 | DUP2 |
| **Analyte** | **Unit** | **#1** | **#2** | | | | |
| Acenaphthene | ug/L | 4.1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Acenaphthylene | ug/L | 1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Anthracene | ug/L | 1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(a)anthracene | ug/L | 1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(a)pyrene | ug/L | 0.01 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Benzo(b)fluoranthene | ug/L | 0.1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(g,h,i)perylene | ug/L | 0.2 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Benzo(k)fluoranthene | ug/L | 0.1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Chrysene | ug/L | 0.1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Dibenzo(ah)anthracene | ug/L | 0.2 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Fluoranthene | ug/L | 0.41 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Fluorene | ug/L | 120 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Indeno(1,2,3-cd)pyrene | ug/L | 0.2 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| 1+2-Methylnaphthalenes | ug/L | 3.2 | - | <0.028 | <0.028 | <0.028 | <0.028 |
| 1-Methylnaphthalene | ug/L | 3.2 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| 2-Methylnaphthalene | ug/L | 3.2 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Naphthalene | ug/L | 11 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Phenanthrene | ug/L | 1 | - | <0.020 | <0.020 | 0.029 | <0.020 |
| Pyrene | ug/L | 4.1 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Surrogate: d10-Acenaphthene | % | - | - | 111.7 | 106.5 | 112.7 | 109.3 |
| Surrogate: d12-Chrysene | % | - | - | 91.9 | 80.0 | 90.8 | 93.7 |
| Surrogate: d8-Naphthalene | % | - | - | 101.3 | 92.6 | 103.8 | 99.9 |
| Surrogate: d10-Phenanthrene | % | - | - | 112.2 | 107.3 | 111.1 | 107.7 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# ANALYTICAL REPORT

## Organochlorine Pesticides - WATER

| | | Lab ID | L2217334-2 | L2217334-4 | L2217334-5 | L2217334-8 |
|---|---|---|---|---|---|---|
| | | Sample Date | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 | 07-JAN-19 |
| | | Sample ID | BH18-2 | BH18-5 | BH18-6 | DUP1 |
| Analyte | Unit | Guide Limits #1 | #2 | | | |
| Aldrin | ug/L | 0.35 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| gamma-hexachlorocyclohexane | ug/L | 0.95 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| a-chlordane | ug/L | - | - | <0.040 | <0.040 | <0.040 | <0.040 |
| Chlordane (Total) | ug/L | 0.06 | - | <0.057 | <0.057 | <0.057 | <0.057 |
| g-chlordane | ug/L | - | - | <0.040 | <0.040 | <0.040 | <0.040 |
| o,p-DDD | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| pp-DDD | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| Total DDD | ug/L | 1.8 | - | <0.042 | <0.042 | <0.042 | <0.042 |
| o,p-DDE | ug/L | - | - | <0.0080 | <0.0080 | <0.0080 | <0.0080 |
| pp-DDE | ug/L | - | - | <0.0080 | <0.0080 | <0.0080 | <0.0080 |
| Total DDE | ug/L | 10 | - | <0.011 | <0.011 | <0.011 | <0.011 |
| op-DDT | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| pp-DDT | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| Total DDT | ug/L | 0.05 | - | <0.042 | <0.042 | <0.042 | <0.042 |
| Dieldrin | ug/L | 0.35 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Endosulfan I | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| Endosulfan II | ug/L | - | - | <0.030 | <0.030 | <0.030 | <0.030 |
| Endosulfan (Total) | ug/L | 0.56 | - | <0.042 | <0.042 | <0.042 | <0.042 |
| Endrin | ug/L | 0.36 | - | <0.040 | <0.040 | <0.040 | <0.040 |
| Heptachlor | ug/L | 0.038 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Heptachlor Epoxide | ug/L | 0.038 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobenzene | ug/L | 1 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachlorobutadiene | ug/L | 0.44 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Hexachloroethane | ug/L | 2.1 | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Methoxychlor | ug/L | 0.3 | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Surrogate: 2-Fluorobiphenyl | % | - | - | 91.9 | 113.4 | 105.2 | 105.9 |
| Surrogate: d14-Terphenyl | % | - | - | 121.0 | 129.4 | 145.0 RRR | 126.4 |

**Guide Limit #1: T8-Ground Water - All Types of Property Use**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

# Reference Information

**Additional Comments for Sample Listed:**

| Samplenum | Matrix | Report Remarks | Sample Comments |
|---|---|---|---|
| L2217334-10 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |
| L2217334-2 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |
| L2217334-3 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |
| L2217334-5 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |
| L2217334-5 | Water | Note: RRR: d14-T surrogate results exceed ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified. | |
| L2217334-6 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |
| L2217334-7 | Water | Note: Cr6: Sample was lab-filtered. Parameter exceeded hold time prior to analysis. | |

**Qualifiers for Individual Parameters Listed:**

| Qualifier | Description |
|---|---|
| OWP | Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of |

sediment.

RRR Refer to Report Remarks for issues regarding this analysis

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| **CHLORDANE-T-CALC-WT** | Water | Chlordane Total sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **CL-IC-N-WT** | Water | Chloride by IC | EPA 300.1 (mod) |

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **CN-WAD-R511-WT** | Water | Cyanide (WAD)-O.Reg 153/04 | APHA 4500CN I-Weak acid Dist Colorimet |

Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **CR-CR6-IC-R511-WT** | Water | Hex Chrom-O.Reg 153/04 (July 2011) | EPA 7199 |

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **DDD-DDE-DDT-CALC-WT** | Water | DDD, DDE, DDT sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **EC-R511-WT** | Water | Conductivity-O.Reg 153/04 (July 2011) | APHA 2510 B |

Water samples can be measured directly by immersing the conductivity cell into the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **ENDOSULFAN-T-CALC-WT** | Water | Endosulfan Total sums | CALCULATION |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

| | | | |
|---|---|---|---|
| **F1-F4-511-CALC-WT** | Water | F1-F4 Hydrocarbon Calculated Parameters | CCME CWS-PHC, Pub #1310, Dec 2001-L |

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|

Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

| | | | |
|---|---|---|---|
| **F1-HS-511-WT** | Water | F1-O.Reg 153/04 (July 2011) | E3398/CCME TIER 1-HS |

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **F2-F4-511-WT** | Water | F2-F4-O.Reg 153/04 (July 2011) | EPA 3511/CCME Tier 1 |

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **HG-D-UG/L-CVAA-WT** | Water | Diss. Mercury in Water by CVAAS (ug/L) | EPA 1631E (mod) |

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

| | | | |
|---|---|---|---|
| **MET-D-UG/L-MS-WT** | Water | Diss. Metals in Water by ICPMS (ug/L) | EPA 200.8 |

The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **METHYLNAPS-CALC-WT** | Water | PAH-Calculated Parameters | SW846 8270 |
| **PAH-511-WT** | Water | PAH-O. Reg 153/04 (July 2011) | SW846 3510/8270 |

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

| | | | |
|---|---|---|---|
| **PEST-OC-511-WT** | Water | OC Pesticides-O. Reg 153/04 (July 2011) | SW846 8270 (511) |

Aqueous sample is extracted by liquid/liquid extraction with a solvent mix. After extraction, a number of clean up techniques may be applied, depending on the sample matrix and analyzed by GC/MS.

# Reference Information

**Methods Listed (if applicable):**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported). | | | |
| **PH-WT** | Water | pH | APHA 4500 H-Electrode |
| Water samples are analyzed directly by a calibrated pH meter. | | | |
| Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days | | | |
| **VOC-1,3-DCP-CALC-WT** | Water | Regulation 153 VOCs | SW8260B/SW8270C |
| **VOC-511-HS-WT** | Water | VOC by GCMS HS O.Reg 153/04 (July 2011) | SW846 8260 |
| Liquid samples are analyzed by headspace GC/MSD. | | | |
| Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported). | | | |
| **XYLENES-SUM-CALC-WT** | Water | Sum of Xylene Isomer Concentrations | CALCULATION |
| Total xylenes represents the sum of o-xylene and m&p-xylene. | | | |

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-639700

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

| Laboratory Definition Code | Laboratory Location |
|---|---|
| WT | ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA |

# Reference Information



**GLOSSARY OF REPORT TERMS**

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*
*mg/kg - milligrams per kilogram based on dry weight of sample*
*mg/kg wwt - milligrams per kilogram based on wet weight of sample*
*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*
*mg/L - unit of concentration based on volume, parts per million.*
*< - Less than.*
*D.L. - The reporting limit.*
*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*
*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*
*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

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

# Quality Control Report

Workorder: L2217334 Report Date: 15-JAN-19 

Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8

Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **CL-IC-N-WT** | **Water** | | | | | | | |
| **Batch R4438367** | | | | | | | | |
| **WG2966551-10 DUP** | | **L2217352-1** | | | | | | |
| Chloride (Cl) | | 1.65 | 1.63 | | mg/L | 1.4 | 20 | 09-JAN-19 |
| **WG2966551-4 DUP** | | **WG2966551-3** | | | | | | |
| Chloride (Cl) | | 7.73 | 7.77 | | mg/L | 0.5 | 20 | 09-JAN-19 |
| **WG2966551-2 LCS** | | | | | | | | |
| Chloride (Cl) | | | 102.3 | | % | | 90-110 | 09-JAN-19 |
| **WG2966551-7 LCS** | | | | | | | | |
| Chloride (Cl) | | | 101.7 | | % | | 90-110 | 09-JAN-19 |
| **WG2966551-1 MB** | | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 09-JAN-19 |
| **WG2966551-6 MB** | | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 09-JAN-19 |
| **WG2966551-5 MS** | | **WG2966551-3** | | | | | | |
| Chloride (Cl) | | | 104.3 | | % | | 75-125 | 09-JAN-19 |
| **WG2966551-9 MS** | | **L2217352-1** | | | | | | |
| Chloride (Cl) | | | 106.3 | | % | | 75-125 | 09-JAN-19 |
| **CN-WAD-R511-WT** | **Water** | | | | | | | |
| **Batch R4437832** | | | | | | | | |
| **WG2966320-3 DUP** | | **L2217334-2** | | | | | | |
| Cyanide, Weak Acid Diss | | <2.0 | <2.0 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| **WG2966320-2 LCS** | | | | | | | | |
| Cyanide, Weak Acid Diss | | | 101.1 | | % | | 80-120 | 09-JAN-19 |
| **WG2966320-1 MB** | | | | | | | | |
| Cyanide, Weak Acid Diss | | | <2.0 | | ug/L | | 2 | 09-JAN-19 |
| **WG2966320-4 MS** | | **L2217334-2** | | | | | | |
| Cyanide, Weak Acid Diss | | | 86.8 | | % | | 75-125 | 09-JAN-19 |
| **CR-CR6-IC-R511-WT** | **Water** | | | | | | | |
| **Batch R4435593** | | | | | | | | |
| **WG2966585-4 DUP** | | **WG2966585-3** | | | | | | |
| Chromium, Hexavalent | | 26.1 | 25.5 | | ug/L | 2.3 | 20 | 09-JAN-19 |
| **WG2966585-2 LCS** | | | | | | | | |
| Chromium, Hexavalent | | | 96.2 | | % | | 80-120 | 09-JAN-19 |
| **WG2966585-1 MB** | | | | | | | | |
| Chromium, Hexavalent | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| **WG2966585-5 MS** | | **WG2966585-3** | | | | | | |
| Chromium, Hexavalent | | | 89.1 | | % | | 70-130 | 09-JAN-19 |
| **EC-R511-WT** | **Water** | | | | | | | |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **EC-R511-WT** | **Water** | | | | | | | |
| **Batch R4437536** | | | | | | | | |
| **WG2966443-4 DUP** | | **WG2966443-3** | | | | | | |
| Conductivity | | 2.41 | 2.40 | | mS/cm | 0.4 | 10 | 09-JAN-19 |
| **WG2966443-2 LCS** | | | | | | | | |
| Conductivity | | | 98.0 | | % | | 90-110 | 09-JAN-19 |
| **WG2966443-1 MB** | | | | | | | | |
| Conductivity | | | <0.0030 | | mS/cm | | 0.003 | 09-JAN-19 |
| **F1-HS-511-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-4 DUP** | | **WG2961410-3** | | | | | | |
| F1 (C6-C10) | | <25 | <25 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| **WG2961410-1 LCS** | | | | | | | | |
| F1 (C6-C10) | | | 108.4 | | % | | 80-120 | 10-JAN-19 |
| **WG2961410-2 MB** | | | | | | | | |
| F1 (C6-C10) | | | <25 | | ug/L | | 25 | 10-JAN-19 |
| Surrogate: 3,4-Dichlorotoluene | | | 115.3 | | % | | 60-140 | 10-JAN-19 |
| **WG2961410-5 MS** | | **WG2961410-3** | | | | | | |
| F1 (C6-C10) | | | 93.1 | | % | | 60-140 | 10-JAN-19 |
| **F2-F4-511-WT** | **Water** | | | | | | | |
| **Batch R4436007** | | | | | | | | |
| **WG2966113-2 LCS** | | | | | | | | |
| F2 (C10-C16) | | | 105.8 | | % | | 70-130 | 09-JAN-19 |
| F3 (C16-C34) | | | 108.4 | | % | | 70-130 | 09-JAN-19 |
| F4 (C34-C50) | | | 111.0 | | % | | 70-130 | 09-JAN-19 |
| **WG2966113-3 LCSD** | | **WG2966113-2** | | | | | | |
| F2 (C10-C16) | | 105.8 | 107.8 | | % | 1.9 | 50 | 09-JAN-19 |
| F3 (C16-C34) | | 108.4 | 110.0 | | % | 1.4 | 50 | 09-JAN-19 |
| F4 (C34-C50) | | 111.0 | 109.4 | | % | 1.5 | 50 | 09-JAN-19 |
| **WG2966113-1 MB** | | | | | | | | |
| F2 (C10-C16) | | | <100 | | ug/L | | 100 | 09-JAN-19 |
| F3 (C16-C34) | | | <250 | | ug/L | | 250 | 09-JAN-19 |
| F4 (C34-C50) | | | <250 | | ug/L | | 250 | 09-JAN-19 |
| Surrogate: 2-Bromobenzotrifluoride | | | 112.3 | | % | | 60-140 | 09-JAN-19 |
| **HG-D-UG/L-CVAA-WT** | **Water** | | | | | | | |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **HG-D-UG/L-CVAA-WT** | **Water** | | | | | | | |
| **Batch R4434974** | | | | | | | | |
| **WG2966270-3 DUP** | | **L2217334-1** | | | | | | |
| Mercury (Hg)-Dissolved | | <0.010 | <0.010 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| **WG2966270-2 LCS** | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 105.0 | | % | | 80-120 | 09-JAN-19 |
| **WG2966270-1 MB** | | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| **WG2966270-4 MS** | | **L2217334-2** | | | | | | |
| Mercury (Hg)-Dissolved | | | 81.8 | | % | | 70-130 | 09-JAN-19 |
| **MET-D-UG/L-MS-WT** | **Water** | | | | | | | |
| **Batch R4435347** | | | | | | | | |
| **WG2966167-4 DUP** | | **WG2966167-3** | | | | | | |
| Antimony (Sb)-Dissolved | | 0.33 | 0.32 | | ug/L | 4.0 | 20 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | 3.60 | 3.61 | | ug/L | 0.4 | 20 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | 76.0 | 76.3 | | ug/L | 0.4 | 20 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | <0.10 | <0.10 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Boron (B)-Dissolved | | 265 | 276 | | ug/L | 4.1 | 20 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | 0.0114 | 0.0058 | J | ug/L | 0.0055 | 0.01 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | 0.24 | 0.24 | | ug/L | 0.9 | 20 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | 1.14 | 1.13 | | ug/L | 0.6 | 20 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | 0.139 | 0.144 | | ug/L | 3.1 | 20 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | 22.7 | 23.2 | | ug/L | 2.3 | 20 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | 1.56 | 1.53 | | ug/L | 2.0 | 20 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | 0.285 | 0.298 | | ug/L | 4.4 | 20 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | <0.050 | <0.050 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | 29000 | 29300 | | ug/L | 0.9 | 20 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | 0.027 | 0.029 | | ug/L | 9.6 | 20 | 09-JAN-19 |
| Uranium (U)-Dissolved | | 7.77 | 8.02 | | ug/L | 3.1 | 20 | 09-JAN-19 |
| Vanadium (V)-Dissolved | | 2.12 | 2.11 | | ug/L | 0.5 | 20 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | 6.6 | 6.3 | | ug/L | 3.4 | 20 | 09-JAN-19 |
| **WG2966168-4 DUP** | | **WG2966168-3** | | | | | | |
| Antimony (Sb)-Dissolved | | 0.13 | 0.12 | | ug/L | 6.5 | 20 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | 0.61 | 0.59 | | ug/L | 2.5 | 20 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | 67.3 | 66.5 | | ug/L | 1.2 | 20 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | <0.10 | <0.10 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-D-UG/L-MS-WT** | **Water** | | | | | | | |
| **Batch R4435347** | | | | | | | | |
| **WG2966168-4 DUP** | | **WG2966168-3** | | | | | | |
| Boron (B)-Dissolved | | 115 | 117 | | ug/L | 1.5 | 20 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | <0.0050 | <0.0050 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | 0.12 | 0.12 | | ug/L | 4.2 | 20 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | 0.41 | 0.40 | | ug/L | 2.7 | 20 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | <0.050 | <0.050 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | 6.03 | 6.23 | | ug/L | 3.1 | 20 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | 0.85 | 0.85 | | ug/L | 0.0 | 20 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | 0.693 | 0.659 | | ug/L | 5.0 | 20 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | <0.050 | <0.050 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | 17600 | 17300 | | ug/L | 1.7 | 20 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | 0.016 | 0.016 | | ug/L | 0.3 | 20 | 09-JAN-19 |
| Uranium (U)-Dissolved | | 4.86 | 4.80 | | ug/L | 1.2 | 20 | 09-JAN-19 |
| Vanadium (V)-Dissolved | | 0.63 | 0.63 | | ug/L | 0.3 | 20 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | <1.0 | <1.0 | RPD-NA | ug/L | N/A | 20 | 09-JAN-19 |
| **WG2966167-2 LCS** | | | | | | | | |
| Antimony (Sb)-Dissolved | | | 102.5 | | % | | 80-120 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | 102.6 | | % | | 80-120 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | 106.6 | | % | | 80-120 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | 106.5 | | % | | 80-120 | 09-JAN-19 |
| Boron (B)-Dissolved | | | 105.7 | | % | | 80-120 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | | 102.4 | | % | | 80-120 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | 101.8 | | % | | 80-120 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | 99.7 | | % | | 80-120 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | 98.8 | | % | | 80-120 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | 101.4 | | % | | 80-120 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | 106.1 | | % | | 80-120 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | | 99.5 | | % | | 80-120 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | 97.0 | | % | | 80-120 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | 104.8 | | % | | 80-120 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | | 100.9 | | % | | 80-120 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | 102.5 | | % | | 80-120 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | 106.9 | | % | | 80-120 | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-D-UG/L-MS-WT** | **Water** | | | | | | | |
| **Batch R4435347** | | | | | | | | |
| **WG2966167-2 LCS** | | | | | | | | |
| Vanadium (V)-Dissolved | | | 102.4 | | % | | 80-120 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | 101.4 | | % | | 80-120 | 09-JAN-19 |
| **WG2966168-2 LCS** | | | | | | | | |
| Antimony (Sb)-Dissolved | | | 105.4 | | % | | 80-120 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | 101.6 | | % | | 80-120 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | 103.5 | | % | | 80-120 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | 104.3 | | % | | 80-120 | 09-JAN-19 |
| Boron (B)-Dissolved | | | 101.7 | | % | | 80-120 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | | 103.0 | | % | | 80-120 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | 102.2 | | % | | 80-120 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | 100.2 | | % | | 80-120 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | 98.6 | | % | | 80-120 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | 100.6 | | % | | 80-120 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | 103.5 | | % | | 80-120 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | | 99.0 | | % | | 80-120 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | 97.4 | | % | | 80-120 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | 107.9 | | % | | 80-120 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | | 98.9 | | % | | 80-120 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | 104.4 | | % | | 80-120 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | 105.1 | | % | | 80-120 | 09-JAN-19 |
| Vanadium (V)-Dissolved | | | 102.7 | | % | | 80-120 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | 101.5 | | % | | 80-120 | 09-JAN-19 |
| **WG2966167-1 MB** | | | | | | | | |
| Antimony (Sb)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Boron (B)-Dissolved | | | <10 | | ug/L | | 10 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | | <0.0050 | | ug/L | | 0.005 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | <0.20 | | ug/L | | 0.2 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-D-UG/L-MS-WT** | **Water** | | | | | | | |
| **Batch R4435347** | | | | | | | | |
| **WG2966167-1 MB** | | | | | | | | |
| Nickel (Ni)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | | <50 | | ug/L | | 50 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| Vanadium (V)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | <1.0 | | ug/L | | 1 | 09-JAN-19 |
| **WG2966168-1 MB** | | | | | | | | |
| Antimony (Sb)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Boron (B)-Dissolved | | | <10 | | ug/L | | 10 | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | | <0.0050 | | ug/L | | 0.005 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | <0.10 | | ug/L | | 0.1 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | <0.20 | | ug/L | | 0.2 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | | <50 | | ug/L | | 50 | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| Vanadium (V)-Dissolved | | | <0.50 | | ug/L | | 0.5 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | <1.0 | | ug/L | | 1 | 09-JAN-19 |
| **WG2966167-5 MS** | | **WG2966167-3** | | | | | | |
| Antimony (Sb)-Dissolved | | | 99.6 | | % | | 70-130 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | 101.6 | | % | | 70-130 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | 101.9 | | % | | 70-130 | 09-JAN-19 |
| Boron (B)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **MET-D-UG/L-MS-WT** | **Water** | | | | | | | |
| **Batch R4435347** | | | | | | | | |
| **WG2966167-5 MS** | | **WG2966167-3** | | | | | | |
| Cadmium (Cd)-Dissolved | | | 102.9 | | % | | 70-130 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | 100.9 | | % | | 70-130 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | 96.1 | | % | | 70-130 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | 94.0 | | % | | 70-130 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | 95.1 | | % | | 70-130 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | | 93.2 | | % | | 70-130 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | 101.9 | | % | | 70-130 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | 88.1 | | % | | 70-130 | 09-JAN-19 |
| Sodium (Na)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | 97.6 | | % | | 70-130 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Vanadium (V)-Dissolved | | | 103.6 | | % | | 70-130 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | 93.5 | | % | | 70-130 | 09-JAN-19 |
| **WG2966168-5 MS** | | **WG2966168-6** | | | | | | |
| Antimony (Sb)-Dissolved | | | 100.9 | | % | | 70-130 | 09-JAN-19 |
| Arsenic (As)-Dissolved | | | 101.9 | | % | | 70-130 | 09-JAN-19 |
| Barium (Ba)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Beryllium (Be)-Dissolved | | | 105.4 | | % | | 70-130 | 09-JAN-19 |
| Boron (B)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Cadmium (Cd)-Dissolved | | | 103.2 | | % | | 70-130 | 09-JAN-19 |
| Chromium (Cr)-Dissolved | | | 97.2 | | % | | 70-130 | 09-JAN-19 |
| Cobalt (Co)-Dissolved | | | 95.3 | | % | | 70-130 | 09-JAN-19 |
| Copper (Cu)-Dissolved | | | 91.8 | | % | | 70-130 | 09-JAN-19 |
| Lead (Pb)-Dissolved | | | 97.1 | | % | | 70-130 | 09-JAN-19 |
| Molybdenum (Mo)-Dissolved | | | 96.8 | | % | | 70-130 | 09-JAN-19 |
| Nickel (Ni)-Dissolved | | | 92.1 | | % | | 70-130 | 09-JAN-19 |
| Selenium (Se)-Dissolved | | | 98.6 | | % | | 70-130 | 09-JAN-19 |
| Silver (Ag)-Dissolved | | | 97.8 | | % | | 70-130 | 10-JAN-19 |
| Sodium (Na)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Thallium (Tl)-Dissolved | | | 101.3 | | % | | 70-130 | 09-JAN-19 |
| Uranium (U)-Dissolved | | | N/A | MS-B | % | | - | 09-JAN-19 |
| Vanadium (V)-Dissolved | | | 102.3 | | % | | 70-130 | 09-JAN-19 |
| Zinc (Zn)-Dissolved | | | 95.2 | | % | | 70-130 | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PAH-511-WT** | **Water** | | | | | | | |
| **Batch R4436309** | | | | | | | | |
| **WG2966113-2 LCS** | | | | | | | | |
| 1-Methylnaphthalene | | | 109.4 | | % | | 50-140 | 09-JAN-19 |
| 2-Methylnaphthalene | | | 107.4 | | % | | 50-140 | 09-JAN-19 |
| Acenaphthene | | | 111.6 | | % | | 50-140 | 09-JAN-19 |
| Acenaphthylene | | | 113.8 | | % | | 50-140 | 09-JAN-19 |
| Anthracene | | | 118.1 | | % | | 50-140 | 09-JAN-19 |
| Benzo(a)anthracene | | | 121.0 | | % | | 50-140 | 09-JAN-19 |
| Benzo(a)pyrene | | | 111.0 | | % | | 50-140 | 09-JAN-19 |
| Benzo(b)fluoranthene | | | 101.0 | | % | | 50-140 | 09-JAN-19 |
| Benzo(g,h,i)perylene | | | 113.0 | | % | | 50-140 | 09-JAN-19 |
| Benzo(k)fluoranthene | | | 106.8 | | % | | 50-140 | 09-JAN-19 |
| Chrysene | | | 126.1 | | % | | 50-140 | 09-JAN-19 |
| Dibenzo(ah)anthracene | | | 117.1 | | % | | 50-140 | 09-JAN-19 |
| Fluoranthene | | | 117.9 | | % | | 50-140 | 09-JAN-19 |
| Fluorene | | | 114.0 | | % | | 50-140 | 09-JAN-19 |
| Indeno(1,2,3-cd)pyrene | | | 126.9 | | % | | 50-140 | 09-JAN-19 |
| Naphthalene | | | 108.4 | | % | | 50-140 | 09-JAN-19 |
| Phenanthrene | | | 118.4 | | % | | 50-140 | 09-JAN-19 |
| Pyrene | | | 119.8 | | % | | 50-140 | 09-JAN-19 |
| **WG2966113-3 LCSD** | | **WG2966113-2** | | | | | | |
| 1-Methylnaphthalene | | 109.4 | 105.8 | | % | 3.3 | 50 | 09-JAN-19 |
| 2-Methylnaphthalene | | 107.4 | 101.9 | | % | 5.2 | 50 | 09-JAN-19 |
| Acenaphthene | | 111.6 | 105.8 | | % | 5.3 | 50 | 09-JAN-19 |
| Acenaphthylene | | 113.8 | 108.8 | | % | 4.5 | 50 | 09-JAN-19 |
| Anthracene | | 118.1 | 114.3 | | % | 3.2 | 50 | 09-JAN-19 |
| Benzo(a)anthracene | | 121.0 | 115.6 | | % | 4.5 | 50 | 09-JAN-19 |
| Benzo(a)pyrene | | 111.0 | 107.3 | | % | 3.4 | 50 | 09-JAN-19 |
| Benzo(b)fluoranthene | | 101.0 | 100.9 | | % | 0.1 | 50 | 09-JAN-19 |
| Benzo(g,h,i)perylene | | 113.0 | 109.5 | | % | 3.1 | 50 | 09-JAN-19 |
| Benzo(k)fluoranthene | | 106.8 | 107.0 | | % | 0.2 | 50 | 09-JAN-19 |
| Chrysene | | 126.1 | 117.0 | | % | 7.4 | 50 | 09-JAN-19 |
| Dibenzo(ah)anthracene | | 117.1 | 113.2 | | % | 3.4 | 50 | 09-JAN-19 |
| Fluoranthene | | 117.9 | 113.6 | | % | 3.7 | 50 | 09-JAN-19 |
| Fluorene | | 114.0 | 109.9 | | % | 3.6 | 50 | 09-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PAH-511-WT** | **Water** | | | | | | | |
| **Batch R4436309** | | | | | | | | |
| **WG2966113-3 LCSD** | | **WG2966113-2** | | | | | | |
| Indeno(1,2,3-cd)pyrene | | 126.9 | 124.9 | | % | 1.6 | 50 | 09-JAN-19 |
| Naphthalene | | 108.4 | 103.2 | | % | 4.9 | 50 | 09-JAN-19 |
| Phenanthrene | | 118.4 | 114.6 | | % | 3.2 | 50 | 09-JAN-19 |
| Pyrene | | 119.8 | 113.8 | | % | 5.1 | 50 | 09-JAN-19 |
| **WG2966113-1 MB** | | | | | | | | |
| 1-Methylnaphthalene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| 2-Methylnaphthalene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Acenaphthene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Acenaphthylene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Anthracene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Benzo(a)anthracene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Benzo(a)pyrene | | | <0.010 | | ug/L | | 0.01 | 09-JAN-19 |
| Benzo(b)fluoranthene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Benzo(g,h,i)perylene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Benzo(k)fluoranthene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Chrysene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Dibenzo(ah)anthracene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Fluoranthene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Fluorene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Indeno(1,2,3-cd)pyrene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Naphthalene | | | <0.050 | | ug/L | | 0.05 | 09-JAN-19 |
| Phenanthrene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Pyrene | | | <0.020 | | ug/L | | 0.02 | 09-JAN-19 |
| Surrogate: d8-Naphthalene | | | 97.1 | | % | | 60-140 | 09-JAN-19 |
| Surrogate: d10-Phenanthrene | | | 113.5 | | % | | 60-140 | 09-JAN-19 |
| Surrogate: d12-Chrysene | | | 103.1 | | % | | 60-140 | 09-JAN-19 |
| Surrogate: d10-Acenaphthene | | | 107.8 | | % | | 60-140 | 09-JAN-19 |
| **PEST-OC-511-WT** | **Water** | | | | | | | |
| **Batch R4447011** | | | | | | | | |
| **WG2966203-2 LCS** | | | | | | | | |
| Aldrin | | | 88.6 | | % | | 50-140 | 15-JAN-19 |
| a-chlordane | | | 91.9 | | % | | 50-140 | 15-JAN-19 |
| g-chlordane | | | 92.0 | | % | | 50-140 | 15-JAN-19 |
| o,p-DDD | | | 88.6 | | % | | 50-140 | 15-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PEST-OC-511-WT** | **Water** | | | | | | | |
| **Batch R4447011** | | | | | | | | |
| **WG2966203-2 LCS** | | | | | | | | |
| pp-DDD | | | 87.1 | | % | | 50-140 | 15-JAN-19 |
| o,p-DDE | | | 89.6 | | % | | 50-140 | 15-JAN-19 |
| pp-DDE | | | 85.8 | | % | | 50-140 | 15-JAN-19 |
| op-DDT | | | 115.7 | | % | | 50-140 | 15-JAN-19 |
| pp-DDT | | | 127.9 | | % | | 50-140 | 15-JAN-19 |
| Dieldrin | | | 96.5 | | % | | 50-140 | 15-JAN-19 |
| Endosulfan I | | | 92.2 | | % | | 50-140 | 15-JAN-19 |
| Endosulfan II | | | 93.2 | | % | | 50-140 | 15-JAN-19 |
| Endrin | | | 123.6 | | % | | 50-140 | 15-JAN-19 |
| gamma-hexachlorocyclohexane | | | 95.5 | | % | | 50-140 | 15-JAN-19 |
| Heptachlor | | | 105.1 | | % | | 50-140 | 15-JAN-19 |
| Heptachlor Epoxide | | | 108.2 | | % | | 50-140 | 15-JAN-19 |
| Hexachlorobenzene | | | 82.8 | | % | | 40-130 | 15-JAN-19 |
| Hexachlorobutadiene | | | 67.0 | | % | | 40-130 | 15-JAN-19 |
| Hexachloroethane | | | 57.9 | | % | | 40-130 | 15-JAN-19 |
| Methoxychlor | | | 145.9 | LCS-H | % | | 50-140 | 15-JAN-19 |
| **WG2966203-1 MB** | | | | | | | | |
| Aldrin | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| a-chlordane | | | <0.040 | | ug/L | | 0.04 | 15-JAN-19 |
| g-chlordane | | | <0.040 | | ug/L | | 0.04 | 15-JAN-19 |
| o,p-DDD | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| pp-DDD | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| o,p-DDE | | | <0.0080 | | ug/L | | 0.008 | 15-JAN-19 |
| pp-DDE | | | <0.0080 | | ug/L | | 0.008 | 15-JAN-19 |
| op-DDT | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| pp-DDT | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| Dieldrin | | | <0.050 | | ug/L | | 0.05 | 15-JAN-19 |
| Endosulfan I | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| Endosulfan II | | | <0.030 | | ug/L | | 0.03 | 15-JAN-19 |
| Endrin | | | <0.040 | | ug/L | | 0.04 | 15-JAN-19 |
| gamma-hexachlorocyclohexane | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| Heptachlor | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| Heptachlor Epoxide | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| Hexachlorobenzene | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **PEST-OC-511-WT** | **Water** | | | | | | | |
| **Batch R4447011** | | | | | | | | |
| **WG2966203-1 MB** | | | | | | | | |
| Hexachlorobutadiene | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| Hexachloroethane | | | <0.010 | | ug/L | | 0.01 | 15-JAN-19 |
| Methoxychlor | | | <0.050 | | ug/L | | 0.05 | 15-JAN-19 |
| Surrogate: 2-Fluorobiphenyl | | | 95.8 | | % | | 50-140 | 15-JAN-19 |
| Surrogate: d14-Terphenyl | | | 97.4 | | % | | 60-140 | 15-JAN-19 |
| **PH-WT** | **Water** | | | | | | | |
| **Batch R4437536** | | | | | | | | |
| **WG2966443-4 DUP** | | **WG2966443-3** | | | | | | |
| pH | | 7.69 | 7.66 | J | pH units | 0.03 | 0.2 | 09-JAN-19 |
| **WG2966443-2 LCS** | | | | | | | | |
| pH | | | 7.00 | | pH units | | 6.9-7.1 | 09-JAN-19 |
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-4 DUP** | | **WG2961410-3** | | | | | | |
| 1,1,1,2-Tetrachloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,1,2,2-Tetrachloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,1,1-Trichloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,1,2-Trichloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,1-Dichloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,1-Dichloroethylene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,2-Dibromoethane | | <0.20 | <0.20 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,2-Dichlorobenzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,2-Dichloroethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,2-Dichloropropane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,3-Dichlorobenzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| 1,4-Dichlorobenzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Acetone | | <30 | <30 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Benzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Bromodichloromethane | | <2.0 | <2.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Bromoform | | <5.0 | <5.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Bromomethane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Carbon tetrachloride | | <0.20 | <0.20 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Chlorobenzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-4 DUP** | | **WG2961410-3** | | | | | | |
| Chloroform | | <1.0 | <1.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| cis-1,2-Dichloroethylene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| cis-1,3-Dichloropropene | | <0.30 | <0.30 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Dibromochloromethane | | <2.0 | <2.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Dichlorodifluoromethane | | <2.0 | <2.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Ethylbenzene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| n-Hexane | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| m+p-Xylenes | | <0.40 | <0.40 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Methyl Ethyl Ketone | | <20 | <20 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Methyl Isobutyl Ketone | | <20 | <20 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Methylene Chloride | | <5.0 | <5.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| MTBE | | <2.0 | <2.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| o-Xylene | | <0.30 | <0.30 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Styrene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Tetrachloroethylene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Toluene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| trans-1,2-Dichloroethylene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| trans-1,3-Dichloropropene | | <0.30 | <0.30 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Trichloroethylene | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Trichlorofluoromethane | | <5.0 | <5.0 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| Vinyl chloride | | <0.50 | <0.50 | RPD-NA | ug/L | N/A | 30 | 10-JAN-19 |
| **WG2961410-1 LCS** | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | | | 98.4 | | % | | 70-130 | 10-JAN-19 |
| 1,1,2,2-Tetrachloroethane | | | 106.8 | | % | | 70-130 | 10-JAN-19 |
| 1,1,1-Trichloroethane | | | 101.2 | | % | | 70-130 | 10-JAN-19 |
| 1,1,2-Trichloroethane | | | 106.8 | | % | | 70-130 | 10-JAN-19 |
| 1,1-Dichloroethane | | | 103.4 | | % | | 70-130 | 10-JAN-19 |
| 1,1-Dichloroethylene | | | 105.8 | | % | | 70-130 | 10-JAN-19 |
| 1,2-Dibromoethane | | | 102.4 | | % | | 70-130 | 10-JAN-19 |
| 1,2-Dichlorobenzene | | | 106.2 | | % | | 70-130 | 10-JAN-19 |
| 1,2-Dichloroethane | | | 103.6 | | % | | 70-130 | 10-JAN-19 |
| 1,2-Dichloropropane | | | 99.8 | | % | | 70-130 | 10-JAN-19 |
| 1,3-Dichlorobenzene | | | 111.1 | | % | | 70-130 | 10-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-1 LCS** | | | | | | | | |
| 1,4-Dichlorobenzene | | | 111.4 | | % | | 70-130 | 10-JAN-19 |
| Acetone | | | 121.9 | | % | | 60-140 | 10-JAN-19 |
| Benzene | | | 106.9 | | % | | 70-130 | 10-JAN-19 |
| Bromodichloromethane | | | 94.0 | | % | | 70-130 | 10-JAN-19 |
| Bromoform | | | 95.7 | | % | | 70-130 | 10-JAN-19 |
| Bromomethane | | | 128.5 | | % | | 60-140 | 10-JAN-19 |
| Carbon tetrachloride | | | 102.2 | | % | | 70-130 | 10-JAN-19 |
| Chlorobenzene | | | 104.9 | | % | | 70-130 | 10-JAN-19 |
| Chloroform | | | 98.4 | | % | | 70-130 | 10-JAN-19 |
| cis-1,2-Dichloroethylene | | | 99.2 | | % | | 70-130 | 10-JAN-19 |
| cis-1,3-Dichloropropene | | | 98.3 | | % | | 70-130 | 10-JAN-19 |
| Dibromochloromethane | | | 99.0 | | % | | 70-130 | 10-JAN-19 |
| Dichlorodifluoromethane | | | 104.6 | | % | | 50-140 | 10-JAN-19 |
| Ethylbenzene | | | 106.5 | | % | | 70-130 | 10-JAN-19 |
| n-Hexane | | | 113.7 | | % | | 70-130 | 10-JAN-19 |
| m+p-Xylenes | | | 103.2 | | % | | 70-130 | 10-JAN-19 |
| Methyl Ethyl Ketone | | | 119.7 | | % | | 60-140 | 10-JAN-19 |
| Methyl Isobutyl Ketone | | | 97.5 | | % | | 60-140 | 10-JAN-19 |
| Methylene Chloride | | | 108.6 | | % | | 70-130 | 10-JAN-19 |
| MTBE | | | 107.4 | | % | | 70-130 | 10-JAN-19 |
| o-Xylene | | | 102.5 | | % | | 70-130 | 10-JAN-19 |
| Styrene | | | 101.4 | | % | | 70-130 | 10-JAN-19 |
| Tetrachloroethylene | | | 110.4 | | % | | 70-130 | 10-JAN-19 |
| Toluene | | | 106.4 | | % | | 70-130 | 10-JAN-19 |
| trans-1,2-Dichloroethylene | | | 106.5 | | % | | 70-130 | 10-JAN-19 |
| trans-1,3-Dichloropropene | | | 100.1 | | % | | 70-130 | 10-JAN-19 |
| Trichloroethylene | | | 106.2 | | % | | 70-130 | 10-JAN-19 |
| Trichlorofluoromethane | | | 113.9 | | % | | 60-140 | 10-JAN-19 |
| Vinyl chloride | | | 93.5 | | % | | 60-140 | 10-JAN-19 |
| **WG2961410-2 MB** | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,1,2,2-Tetrachloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,1,1-Trichloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,1,2-Trichloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-2 MB** | | | | | | | | |
| 1,1-Dichloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,1-Dichloroethylene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,2-Dibromoethane | | | <0.20 | | ug/L | | 0.2 | 10-JAN-19 |
| 1,2-Dichlorobenzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,2-Dichloroethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,2-Dichloropropane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,3-Dichlorobenzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| 1,4-Dichlorobenzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Acetone | | | <30 | | ug/L | | 30 | 10-JAN-19 |
| Benzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Bromodichloromethane | | | <2.0 | | ug/L | | 2 | 10-JAN-19 |
| Bromoform | | | <5.0 | | ug/L | | 5 | 10-JAN-19 |
| Bromomethane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Carbon tetrachloride | | | <0.20 | | ug/L | | 0.2 | 10-JAN-19 |
| Chlorobenzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Chloroform | | | <1.0 | | ug/L | | 1 | 10-JAN-19 |
| cis-1,2-Dichloroethylene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| cis-1,3-Dichloropropene | | | <0.30 | | ug/L | | 0.3 | 10-JAN-19 |
| Dibromochloromethane | | | <2.0 | | ug/L | | 2 | 10-JAN-19 |
| Dichlorodifluoromethane | | | <2.0 | | ug/L | | 2 | 10-JAN-19 |
| Ethylbenzene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| n-Hexane | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| m+p-Xylenes | | | <0.40 | | ug/L | | 0.4 | 10-JAN-19 |
| Methyl Ethyl Ketone | | | <20 | | ug/L | | 20 | 10-JAN-19 |
| Methyl Isobutyl Ketone | | | <20 | | ug/L | | 20 | 10-JAN-19 |
| Methylene Chloride | | | <5.0 | | ug/L | | 5 | 10-JAN-19 |
| MTBE | | | <2.0 | | ug/L | | 2 | 10-JAN-19 |
| o-Xylene | | | <0.30 | | ug/L | | 0.3 | 10-JAN-19 |
| Styrene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Tetrachloroethylene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Toluene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| trans-1,2-Dichloroethylene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| trans-1,3-Dichloropropene | | | <0.30 | | ug/L | | 0.3 | 10-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch** | **R4438097** | | | | | | | |
| **WG2961410-2** | **MB** | | | | | | | |
| Trichloroethylene | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Trichlorofluoromethane | | | <5.0 | | ug/L | | 5 | 10-JAN-19 |
| Vinyl chloride | | | <0.50 | | ug/L | | 0.5 | 10-JAN-19 |
| Surrogate: 1,4-Difluorobenzene | | | 101.8 | | % | | 70-130 | 10-JAN-19 |
| Surrogate: 4-Bromofluorobenzene | | | 98.7 | | % | | 70-130 | 10-JAN-19 |
| **WG2961410-5** | **MS** | **WG2961410-3** | | | | | | |
| 1,1,1,2-Tetrachloroethane | | | 101.0 | | % | | 50-140 | 10-JAN-19 |
| 1,1,2,2-Tetrachloroethane | | | 116.3 | | % | | 50-140 | 10-JAN-19 |
| 1,1,1-Trichloroethane | | | 102.3 | | % | | 50-140 | 10-JAN-19 |
| 1,1,2-Trichloroethane | | | 113.0 | | % | | 50-140 | 10-JAN-19 |
| 1,1-Dichloroethane | | | 106.0 | | % | | 50-140 | 10-JAN-19 |
| 1,1-Dichloroethylene | | | 103.1 | | % | | 50-140 | 10-JAN-19 |
| 1,2-Dibromoethane | | | 108.7 | | % | | 50-140 | 10-JAN-19 |
| 1,2-Dichlorobenzene | | | 106.3 | | % | | 50-140 | 10-JAN-19 |
| 1,2-Dichloroethane | | | 105.5 | | % | | 50-140 | 10-JAN-19 |
| 1,2-Dichloropropane | | | 102.6 | | % | | 50-140 | 10-JAN-19 |
| 1,3-Dichlorobenzene | | | 107.2 | | % | | 50-140 | 10-JAN-19 |
| 1,4-Dichlorobenzene | | | 107.5 | | % | | 50-140 | 10-JAN-19 |
| Acetone | | | 120.7 | | % | | 50-140 | 10-JAN-19 |
| Benzene | | | 109.2 | | % | | 50-140 | 10-JAN-19 |
| Bromodichloromethane | | | 99.2 | | % | | 50-140 | 10-JAN-19 |
| Bromoform | | | 102.3 | | % | | 50-140 | 10-JAN-19 |
| Bromomethane | | | 124.5 | | % | | 50-140 | 10-JAN-19 |
| Carbon tetrachloride | | | 98.7 | | % | | 50-140 | 10-JAN-19 |
| Chlorobenzene | | | 105.4 | | % | | 50-140 | 10-JAN-19 |
| Chloroform | | | 101.3 | | % | | 50-140 | 10-JAN-19 |
| cis-1,2-Dichloroethylene | | | 101.2 | | % | | 50-140 | 10-JAN-19 |
| cis-1,3-Dichloropropene | | | 95.3 | | % | | 50-140 | 10-JAN-19 |
| Dibromochloromethane | | | 103.9 | | % | | 50-140 | 10-JAN-19 |
| Dichlorodifluoromethane | | | 91.4 | | % | | 50-140 | 10-JAN-19 |
| Ethylbenzene | | | 104.6 | | % | | 50-140 | 10-JAN-19 |
| n-Hexane | | | 108.3 | | % | | 50-140 | 10-JAN-19 |
| m+p-Xylenes | | | 100.9 | | % | | 50-140 | 10-JAN-19 |
| Methyl Ethyl Ketone | | | 110.0 | | % | | 50-140 | 10-JAN-19 |

# Quality Control Report



Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---|---|---|---|---|---|---|---|
| **VOC-511-HS-WT** | **Water** | | | | | | | |
| **Batch R4438097** | | | | | | | | |
| **WG2961410-5 MS** | | **WG2961410-3** | | | | | | |
| Methyl Isobutyl Ketone | | | 107.0 | | % | | 50-140 | 10-JAN-19 |
| Methylene Chloride | | | 110.8 | | % | | 50-140 | 10-JAN-19 |
| MTBE | | | 106.7 | | % | | 50-140 | 10-JAN-19 |
| o-Xylene | | | 102.0 | | % | | 50-140 | 10-JAN-19 |
| Styrene | | | 101.6 | | % | | 50-140 | 10-JAN-19 |
| Tetrachloroethylene | | | 105.1 | | % | | 50-140 | 10-JAN-19 |
| Toluene | | | 106.0 | | % | | 50-140 | 10-JAN-19 |
| trans-1,2-Dichloroethylene | | | 102.3 | | % | | 50-140 | 10-JAN-19 |
| trans-1,3-Dichloropropene | | | 98.0 | | % | | 50-140 | 10-JAN-19 |
| Trichloroethylene | | | 103.1 | | % | | 50-140 | 10-JAN-19 |
| Trichlorofluoromethane | | | 109.3 | | % | | 50-140 | 10-JAN-19 |
| Vinyl chloride | | | 89.1 | | % | | 50-140 | 10-JAN-19 |

# Quality Control Report

Workorder: L2217334 Report Date: 15-JAN-19

Client: DS Consultants (Vaughan)
6221 Highway 7 Unit 16
Vaughan ON L4H 0K8
Contact: Shafi Andseta



**Legend:**

| | |
|---|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

**Sample Parameter Qualifier Definitions:**

| Qualifier | Description |
|---|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| LCS-H | Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

**Hold Time Exceedances:**

All test results reported with this submission were conducted within ALS recommended hold times.

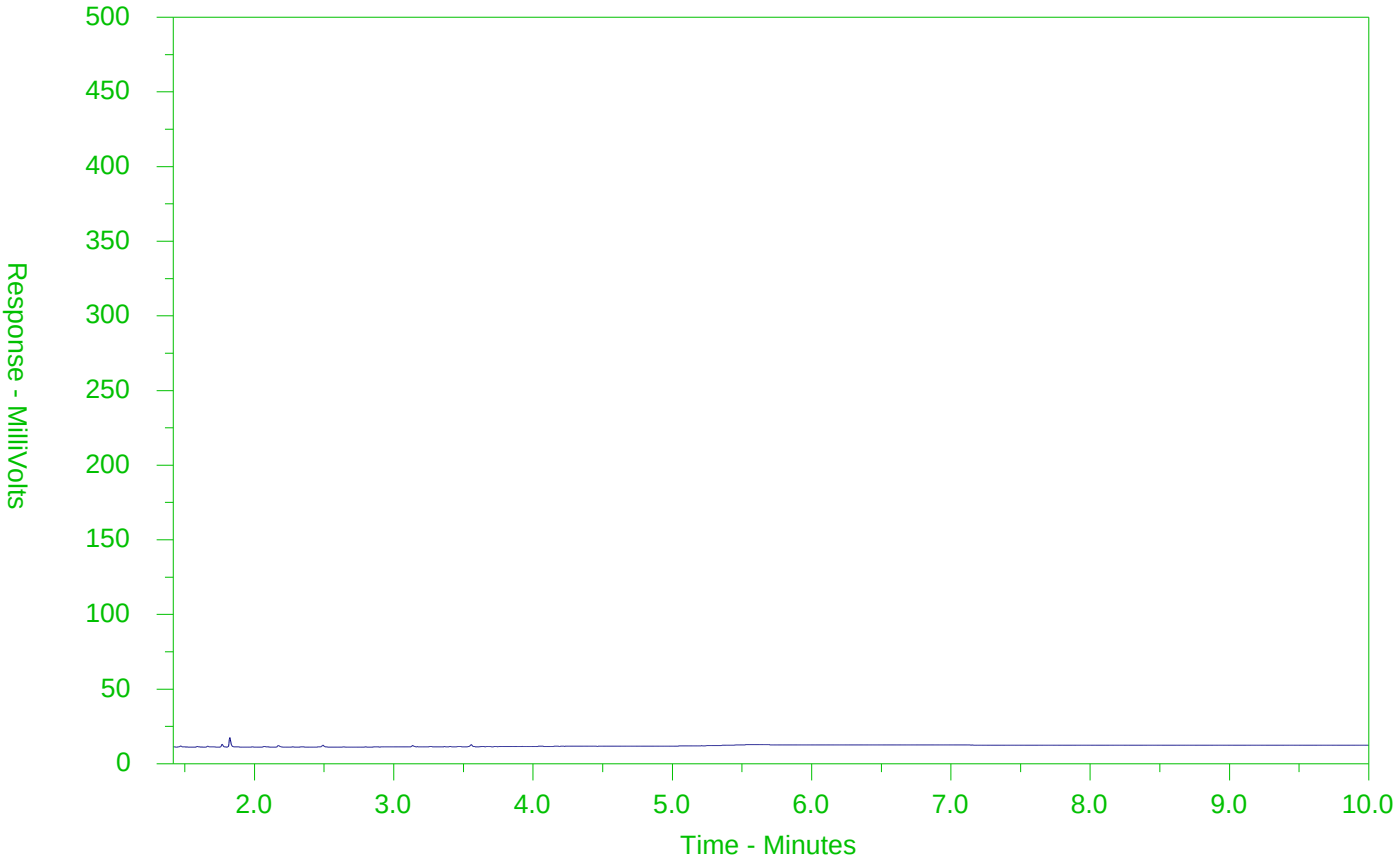
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2217334-1
Client Sample ID: BH18-1




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | ← Motor Oils/Lube Oils/Grease → | | |
| ← Diesel/Jet Fuels → | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

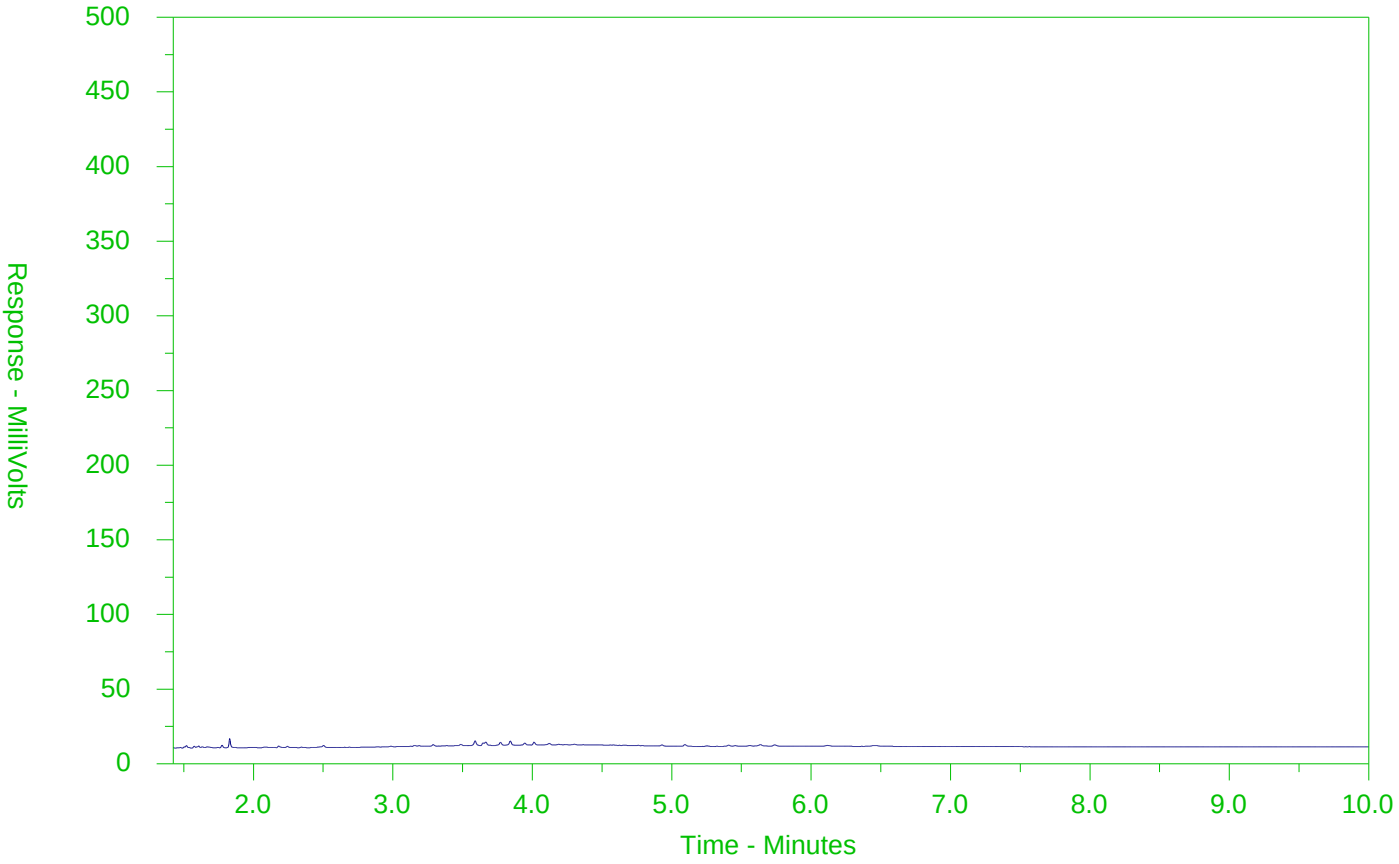
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2217334-6
Client Sample ID: BH18-7




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | ← Motor Oils/Lube Oils/Grease → | | |
| ← Diesel/Jet Fuels → | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

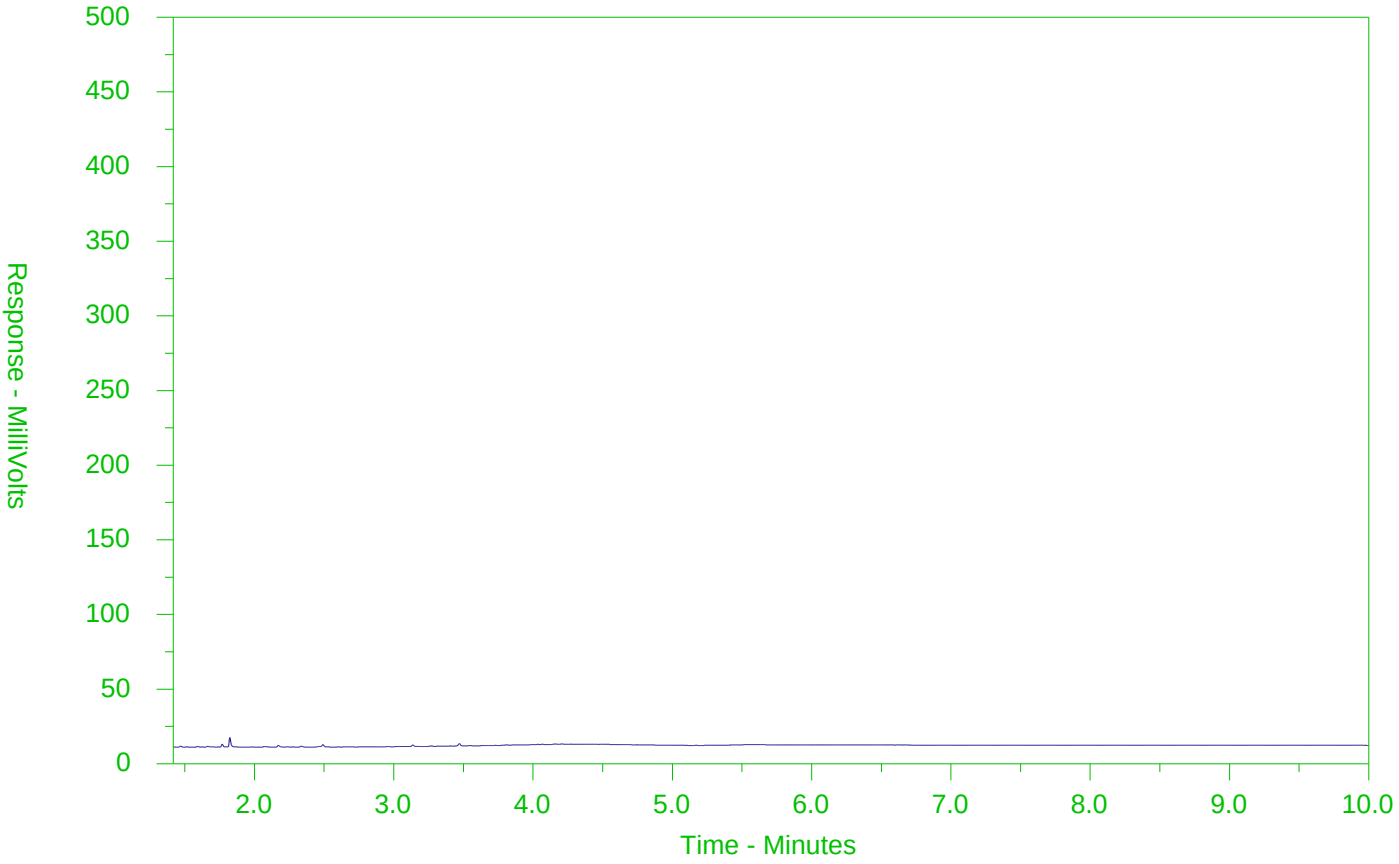
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2217334-7
Client Sample ID: BH18-9




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | | ← Motor Oils/Lube Oils/Grease → | |
| ← Diesel/Jet Fuels → | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

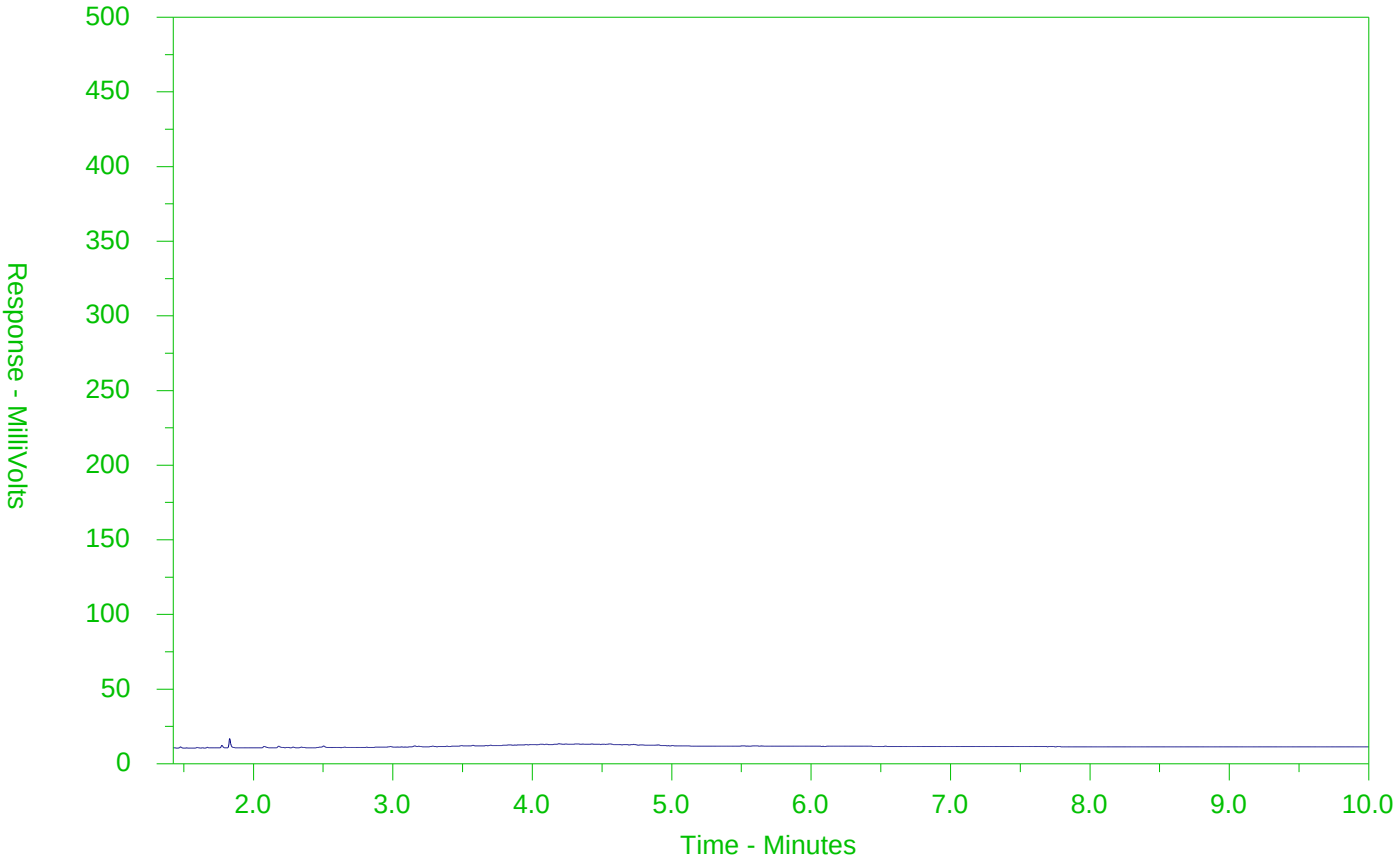
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2217334-11
Client Sample ID: DUP4




| ←F2→ | ←F3→ | ←F4→ | |
|---|---|---|---|
| nC10 | nC16 | nC34 | nC50 |
| 174°C | 287°C | 481°C | 575°C |
| 346°F | 549°F | 898°F | 1067°F |
| Gasoline → | | ← Motor Oils/Lube Oils/Grease → | |
| ← Diesel/Jet Fuels → | | | |

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com
Canada Toll Free: 1 800 668 9878

L2217334-COFC

COC Number: 17-639700
Page of

| Report To | Contact and company name below will appear on the final report | Report Format / Distribution | Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) |
|---|---|---|---|
| Company: | DS Consultants Ltd | Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL) | Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply |
| Contact: | Shafi Andreta | Quality Control (QC) Report with Report ☑ YES ☐ NO | PRIORITY (Business Days): 4 day [P4-20%] ☐; 3 day [P3-25%] ☐; 2 day [P2-50%] ☐ |
| Phone: | 416 529 5454 | ☑ Compare Results to Criteria on Report - provide details below if box checked | EMERGENCY: 1 Business day [E-100%] ☐; Same Day, Weekend or Statutory holiday [E2-200% (Laboratory opening fees may apply)] ☐ |
| | Company address below will appear on the final report | Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX | Date and Time Required for all E&P TATs: |
| Street: | 6221 Highway 7 unit 16 | Email 1 or Fax shafi.andreta@dsconsultants.ca | For tests that can not be performed according to the service level selected, you will be contacted. |
| City/Province: | Woodbridge, ON | Email 2 Isaacfeng@dsconsultants.ca | |
| Postal Code: | L4H 0K8 | Email 3 | |
| Invoice To | Same as Report To ☑ YES ☐ NO | Invoice Distribution | |
| | Copy of Invoice with Report ☑ YES ☐ NO | Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX | |
| Company: | | Email 1 or Fax | |
| Contact: | | Email 2 | |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Account # / Quote #: | | AFE/Cost Center: | PO# |
| Job #: | | Major/Minor Code: | Routing Code: |
| PO / AFE: | 18-687-20 | Requisitioner: | |
| LSD: | | Location: | |
| ALS Lab Work Order # (lab use only): | L2217334 KK | ALS Contact: | Sampler: |

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | Metal + Inorganics | PHCs | VOCs | PAHs | OC Pesticides | SAMPLES ON HOLD | Sample is hazardous (please provide further details) | NUMBER OF CONTAINERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -1 | BH18-1 | 07-01-19 | | GW | X | X | X | | | | | 11 |
| -2 | BH18-2 | | | | X | | | | X | | | 6 |
| -3 | BH18-4 | | | | X | | | X | | | | 7 |
| -4 | BH18-5 | | | | | | | X | X | | | 3 |
| -5 | BH18-6 | | | | X | | | X | X | | | 8 |
| -6 | BH18-7 | | | | X | X | X | | | | | 11 |
| -7 | BH18-9 | | | | X | X | X | | | | | 11 |
| -8 | DUP1 | | | | | | | | X | | | 1 |
| -9 | DUP2 | | | | | | | X | | | | 2 |
| -10 | DUP3 | | | | X | | | | | | | 5 |
| -11 | DUP4 | | | | | X | X | | | | | 6 |
| -12 | trip + field blank | | | | | | X | | | | | 5 |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☐ NO | Use Table 8. With the exception of BH18-4 none of the other M+I samples were filtered. Please lab filter if possible |
| Are samples for human consumption/ use? ☐ YES ☐ NO | |

SAMPLE CONDITION AS RECEIVED (lab use only)

| Frozen | ☐ | SIF Observations | Yes ☐ | No ☐ |
|---|---|---|---|---|
| Ice Packs | ☑ | Ice Cubes ☐ | Custody seal intact | Yes ☐ No ☐ |
| Cooling Initiated | ☐ | | | |

| INITIAL COOLER TEMPERATURES °C | | FINAL COOLER TEMPERATURES °C | |
|---|---|---|---|
| 5.6 | 6.1 | 0.7 | 0.9 |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: | Date: | Time: | Received by: | Date: | Time: | Received by: | Date: | Time: |
| Isaac Feng | Jan 7, 2019 | 5:30PM | | Jan 8/19 | 900 | | 8-JAN-19 | 1440 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

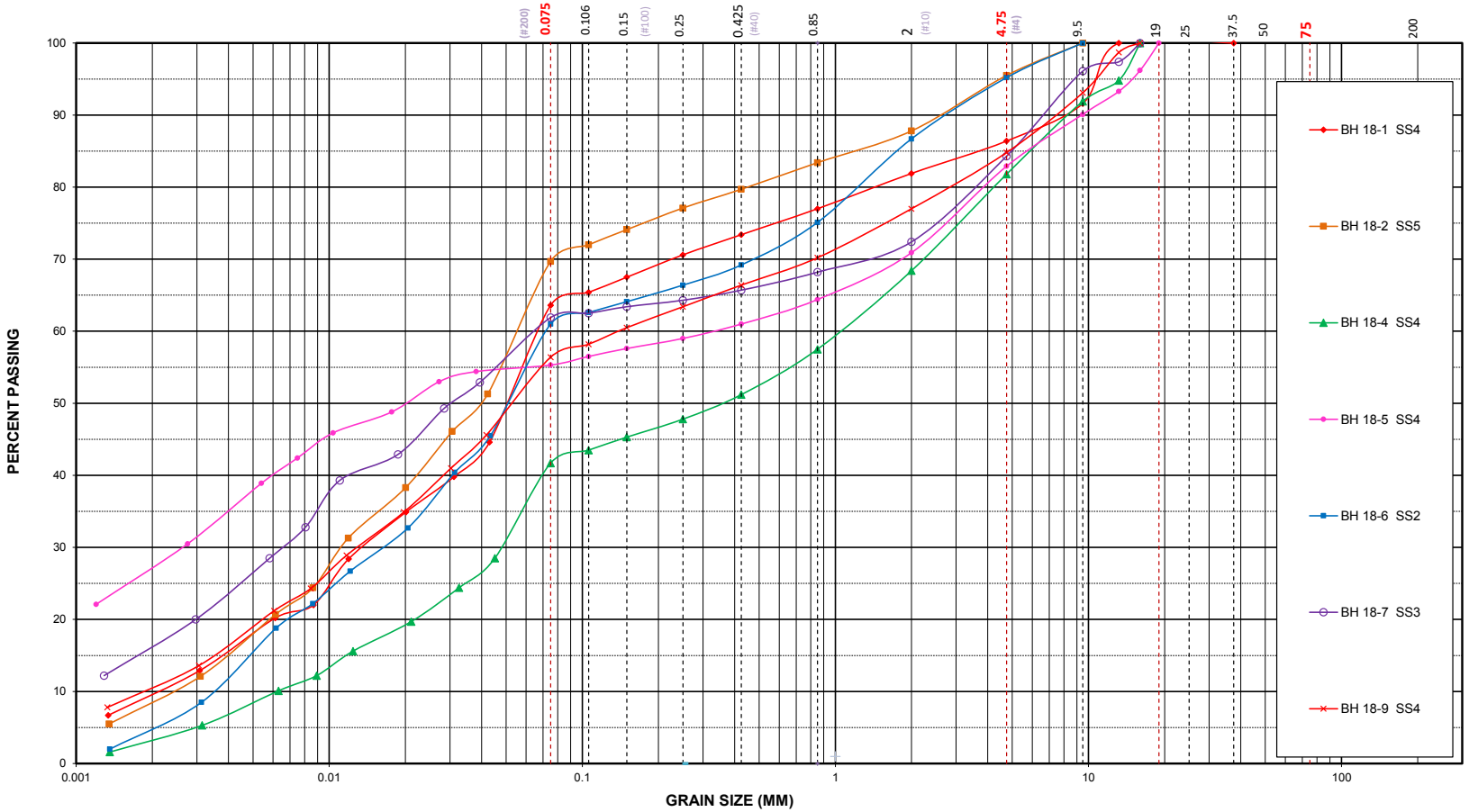
WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

# Appendix D

# Particle Size Distribution (ASTM-D421/D422)




| Silt and Clay | | Sand | | | Gravel | | Cobble + |
|---|---|---|---|---|---|---|---|
| Clay | Silt | Fine | Medium | Coarse | Fine | Coarse | |

Specification and Comments:

DS Consultants Ltd
Geotechnical • Enviromental • Materials • Hydrogeology

| | | | |
|---|---|---|---|
| Project: | **100 Millcroft Golf Course** | Project No.: | **18-687-10** |
| Client: | **ARGO** | Date: | **January 21, 2019** |
| Location: | **Burlington, ON** | Figure No.: | **1** |